The Alumni Journal

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THE Alumni Journal

PUBLISHED BY THE ALUMNI ASSOCIATION
OF THE COLLEGE OF PHARMACY OF THE CITY OF NEW YORK.

Vol. II. New York, January, 1895. No. 1.

DIGESTION AND ITS PHARMACEUTICAL AIDS.

By H. A. HAUBOLD, M. D.,
Assistant to the Chair of Physiology, Bellevue Hospital Medical College.

DIGESTION is the process that food undergoes in its preparation for assimilation by the general system. It is absolutely essential to the maintenance of animal life that food should be introduced into the digestive system, and then be taken up by the blood and distributed to the various parts, organs and tissues of the body. It is impossible to create something from nothing. Growth of tissue does not occur from contact with air.

The average weight of the human adult is 140 pounds. The mean temperature of human being is 99° F. Under ordinary conditions of exercise and rest a human animal consumes itself in about 24 days. This consumption is compensated for only by the introduction of articles of food.

In the time mentioned an animal may consume more than its own weight but never less.

Raising the body temperature (as in fevers) or by increase of muscular energy consumed, a human animal may use up, or burn up, more than its own weight in a given time, and if this is not compensated for by the food the subject loses flesh.

On the other hand, if the animal introduces and assimilates more food than is consumed within this period of time, the body weight is increased.

A body is said to be in a state of physiological equilibrium when the ingesta equals the excreta—it then neither gains nor looses weight.

Food is the fuel that feeds the fire of our human combustion. It is the substance that is consumed in the production of animal heat and force. It bears the same relation to the animal kingdom that coal does to a steam-engine. It is the genuine *vis a tergo* that enables us to perform our functions.

In nature nothing is lost, but all things constantly change their form.

So the human body takes from the surrounding world its means of sustenance. But at the end of a certain time human life ends and our bodies go to nourish the vegetable kingdom, and thus we pay back to earth everything we took from it.

Lack of time and the presence here to-night of casual listeners will not allow me to enter into a minutely detailed description of the organs and their secretions, concerned in the process of digestion, nor am I able to do more than give you a general idea of the classes of foods generally in use.

Still I shall retain enough detail to make the subject sufficiently clear.

Hunger is the local expression of the system's want of nutritive elements, and this sensation is referred to the stomach.

Thirst is the local expression of the want of water in the system, and this sensation is referred to the forces.

Man may live when deprived of food for from five to eight days. Observations on this subject were made by Savigny, a French physician, who was one of 150 unfortunates that were exposed on an open raft from the wreck of the frigate "Medusa" (1816).

These miserable creatures were exposed for thirteen days during which period they were totally destitute of food. Savigny made notes at the time which showed that old and very young persons succumbed first. Death was most frequent when the surrounding temperature was low. Persons with much adipose tissue resisted longest. Only fifteen of all these 150 persons were found alive at the end of the thirteen days. Savigny was one of them.

These observations have been verified since by many physiologists.

According to Chassot animals die of starvation when they have lost four-tenths of their weight.

The classic exhibitions of forty days' starvation are not entitled to scientific consideration.

CLASSIFICATION OF FOOD.

First into the general division of organic and inorganic. The inorganic constituents of food do not undergo any change in digestion and are thrown off in the same condition in which they are taken in. Examples of these are the chlorides of sodium and calcium, the phosphates and iron.

Strange as it may seem they are never the less necessary to life.

Animals crave salt. It would seem that they have some influence on nutrition for when an animal is deprived of salt there is an evident change in the character of the hide. A fact well known among hunters and cattle raisers.

ORGANIC.

1. Nitrogenized or albumenoids.

2. Non-nitrogenized $= \begin{cases} \text{Sugars } C_6H_{12}O_6 \\ \text{Starches } C_6H_{10}O_5 \\ \text{Fats.} \end{cases}$

The organic nitrogenized contain C H O N and S. $\begin{cases} \text{Gluten} \\ \text{Albumen.} \end{cases}$

They are non-crystallizable. Undergo a peculiar change which is called putrefaction and exist in combination with the inorganic constituents.

Most of the nitrogenized elements of food come from the vegetable kingdom. The animals that serve man as articles of diet live on vegetables chiefly.

The vegetable kingdom derives its nitrogen from the salines of the earth. These combine with the starches, the latter being produced from CO_2 and H_2O. None of the nitrogen comes from the air.

They are not discharged from the body in health except in the milk.

They are consumed in the body in the general process of nutrition, and are represented by urea in the urine and perspiration.

NON-NITROGENIZED ALIMENTARY SUBSTANCES.

These are the starches, the sugars and the fats.

The starches and sugars are called carbo-hydrates, because they contain H. and O. in proportion to form H_2O.

Starch $C_6H_{10}O_5$.

Cane sugar $C_{12}H_{22}O_{11}$ = (Saccharose.)

Milk sugar $C_{12}H_{24}O_{12}$ = (Lactose.)

Grape sugar $C_6H_{12}O_6$ = (Glucose.)

Starch undergoes a vast number of changes according to the chemists. But for our purpose it is sufficient to know that all starches and sugars are converted into glucose in digestion, and are taken up in this form by the blood.

The fats are stearine, palmatine and oleine. They are called hydro-carbons, and do not contain H and O in proportion to form H_2O.

The hydro-carbons undergo various changes in digestion, but these are chiefly mechanical.

The digestive fluids ultimately convert them into an emulsion, and they are taken up by the lactols and emptied into the blood.

The hydro-carbons are the elements of diet, chiefly concerned in the production of animal heat.

This accounts for their being the main article of diet in the arctic regions.

I will mention here a few articles that retard the waste of tissue. They are alcohol, tea and coffee. Still they should never be taken to the exclusion of ordinary articles of alimentation in health. Alcohol is one of the most useful agents at our command in the treatment of wasting diseases. But should never be indulged in in health.

This is a physiological, not a social opinion.

The amount of food necessary for the average man under the ordinary conditions of exercise is :

Meat	16℥	
Bread	19℥	
Butter (fat)	3½℥	16)92℥
H_2O	54℥	5¾ = 6)140 =
		24 days about.

The digestive apparatus consists in a general way of the mouth, the stomach and the intestines.

The digestive fluids are :

1. Saliva secreted by the salivary glands.

2. The gastric juice, secreted by the glands in the walk of the stomach.

3. The pancreatic juice, secreted by the pancreas.

4. The bile which comes from the liver.

5. The intestinal juice.

I shall take these up in the order mentioned, and show their action on the various articles of diet as I go on.

Digestion in the mouth is in part mechanical and in part chemical.

Food is masticated by the teeth and is otherwise prepared for deglutition by insalivation, and the introduction of particles of air into its mass to allow of easier access to all of it by the gastric juice.

Although there are several glands in the region of the mouth that contribute a share to the salivary fluid, during the action of this fluid on foods, saliva is a mixture, and we shall consider it as such.

Mixed saliva is opalescent, viscid has a specific gravity 1,004 to 1,008. It is alkaline in reaction. The quantity secreted in 24 hours is about 45 oz., one third during mastication. It contains a peculiar ferment called ptyaline, that exists in proportion of 1.34 parts per 1,000. This ptyaline is convenient in converting starch into glucose. It does not convert all the starch into glucose, and acts most readily on cooked starch. This action does not entirely cease in the stomach, although it is very slight in this organ.

After the bolus of food has been properly masticated and insalivated, it passes down the œsophagus and into the stomach. (Œsophagus is 9 in. long. Deglutition 6 seconds).

The stomach is a pear-shaped organ, situated immediately under the diaphragm. It has a capacity of about 5 pints, and consists of three layers of tissue—the outer a smooth serous membrane, which prevents friction, a middle or muscular coat, which gives it its contractibility, and an inner or mucous coat, which contains the cells that secrete the gastric juice.

These cells are of two kinds — one called acid cells, that secrete the hydrochloric acid, and the other called peptic cells, that secrete the pepsin. According to more recent observations the so-called peptic cells secrete an element that is known as pepsinogen, and this is converted into pepsin by its contact with the hydrochloric acid.

Little was known of the chemical action of this important digestive fluid until the experiments of Beaumont, made on St. Martin during a period extending from 1825 to 1832. St. Martin was a trapper, who followed his calling in the northern part of this State, and it was while in pursuit of game that his hunting-piece was accidentally discharged, inflicting an injury of the wall of the abdomen and tearing away a portion of the stomach. When the patient recovered a fistulous opening remained between the stomach's interior and the external air, and thus it was possible for Beaumont, who had the man under observation for a long time, to make careful analysis of the contents of the stomach from time to time. Since then artificial gastric fistulæ have been frequently established in the lower animals, and it was in this manner that the specimen of gastric juice I now present to you was obtained.

The operation is not a difficult one, but it is not necessary to discuss it here.

During the intervals of digestion the inner surface of the stomach is covered by a layer of thick alkaline mucous, which gives the mucous membrane a pale, slimy appearance. When food is introduced it acts as a stimulus to the gastric cells, and the freshly secreted juice washes this coating away. The membrane then presents a red conjested appearance with small streams of clear gastric juice running down its sides.

The quantity of gastric juice secreted in twenty-four hours is variable and difficult to measure. It is a sure estimate to say that no less than six, no more than fourteen pounds are secreted in a single day. It is of clear amber color (this specimen has been filtered through animal charcoal—to get a fresh specimen, if possible), is of strongly acid reaction, and contains free hydrochloric acid and pepsin.

This specimen was drawn on November 3, and, as you see, is still acid and has not undergone decomposition. The activity of this digestive fluid depends upon pepsin, and the hydrochloric acid. Still other acids may be substituted without interfering with its efficacy.

Action of Gastric Juice.—The bolus of food passes down the œsophagus from the mouth. The saliva continues its action in starch in the presence of the gastric juice, but only to a very slight degree.

The gastric juice converts meat, caseine and the other albumenoids, or what we have classified as the organic nitrogenized elements of diet, into acid peptones. But this class of foods is not entirely digested in the stomach.

Peptones are more osmotic than raw albumenoids. They pass more readily through urinal membranes, and thus they are easily taken up by the blood and distributed to the tissues of the body.

The ultimate destination of all the elements of food is the blood, and from thence to the tissues.

Fats, or the hydro-carbons, are only slightly acted upon by the gastric juice. It dissolves into the fat vesicles, but does not act on the fats themselves.

The carbo-hydrates are subjected to little or no change by the gastric juice. Cane suger is acted on by the acid, but this is unimportant.

Raw starch is hydrated by the warmth of stomach, but is not converted into glucose.

Stomach digestion occupies from three to three and one-half hours. The food is constantly being churned up by the movements of the muscular coat of this organ, and when it is rendered liquid it is forced through the narrow end of the stomach that leads into the small intestine called the pylorus and is subjected to further digestion in the small intestine.

In the small intestine the food is acted upon by the three remaining digestive fluids or juices, namely, the pancreatic juice, the intestinal juice and the bile.

The small intestine is about twenty feet in length. It consists of a horseshoe shaped curve, the duodenum, which is about ten inches in length, and two other portions, the jejunum and ilium. The jejunum is the upper part next the duodenum, and occupies two-fifths of the entire remaining length. The ilium occupies the remaining three-fifths of the small intestine, and ends in the blood pouch called the caecum, which is the beginning of the large or greater intestine.

The coats of the small intestine are identical with those of the stomach, and like that organ, the gut is endowed with contractibility.

The mucous membrane lining the small intestine is closely studded with the glands that secrete the intestinal juice, and also contains the small organs called villi, that absorb the digestive elements after their preparation by the various juices.

The intestinal juice is not readily obtained in its pure state.

Bush, a German physiologist, made a series of valuable observations on a case that came under his care.

The subject of his experimentation had been gored by a bull, the animal's horns entering the small intestine.

After recovery two fistulous openings remained, and it was thus possible to introduce various articles ot diet into one fistula and remove them again from the other.

As the result of these observations we may say that the intestinal juice changes starch into glucose and aids in the digestion of organic nitrogeneous substances. It has no action on cane sugar nor fats.

We come now to the most important of the digestive fluids of intestinal digestion, namely the pancreatic juice.

The pancreas is situated transversely in the upper part of the abdominal cavity. It is about seven inches in length and communicates with the duodenum by two ducts. One that combines with the common bile duct from the liver and the other which enters the intestine by itself at a point about one inch lower down.

The juice of the pancreas is not easily obtained in a normal state. Still observations on this point were successfully made by Bernard.

This physiologist operated on dogs. The animal is fed largely and five to six hours later the duodenum is drawn out of the abdomen through an incision previously made to the lower duct carefully isolated. A slender silver comula is then tied into the duct with a fine ligature and a bladder is fastened on its thistal end to catch the juice as it is secreted.

The success of this operation is influenced by a large number of conditions that I need not enter into here. It is sufficient to say that we succeeded in obtaining a specimen of pure pancreatic juice during the last month in the Physiology Lot at Bellevue and verified some of Bernard's observations.

Pure pancreatic juice is a pale, whitish, viscid fluid readily coagulated by heat, of a distinctly alkaline reaction. Bernard places the specific gravity at 1.040. Observations made by Austin Flint showed specimens with specific gravity of 1.019. It is probably that it varies very greatly. It is secreted only during digestion.

The organic constituents of pancreatic juice are three in number :

Amylopsine which like the ptyaline of the saliva converts starch into glucose.

Trypsine, which like pepsin changes the albumenoids or organic nitro substances into peptones.

The difference here is that peptones in the stomach are acid peptones, whilst peptones digested by pancreatic juice are alkaline peptones or tryptones.

The third ferment is steapsine which acidifies fats. Fats are emulsified by the mechanical acid of pancreatic juice and is the result of its viscidity. There is no such thing as pancreatin in physiology.

The bile, the fifth and last digestive fluid, is not alone a digestive fluid. It contains also elements of disassimilation or waste, and these are thrown off from the body in the forces.

It aids in the digestion of the food and prevents decomposition. It also promotes the contractibility of the intestine and like all fluids that contain waste products it is being constantly secreted.

If we go back for a moment we can see that although the detail of the digestive phenomena somewhat intricate the ultimate conditions of foods when they get into the blood is simple enough.

All the organic nitro. substances are converted into peptones.

All the carbo-hydrates or starches and sugars are ultimately converted into glucose and these two classes are taken up directly by the blood and distributed to the tissues.

The fats, all of them are emulsified, and are taken up by intricate network of special vessels called lacteals, and they, too, are emptied into the blood and are consumed in the production of animal heat and force.

After these changes have taken place, a residue is left over, and this residue together with some other excrementitions substances are thrown off with the dejecta.

The albumenoids are represented in this class of substances by leucine and tyrocine in the small intestine, but these are converted into skatol, iodol and phenol in the large intestine.

Leucine and tyrocine do not exist in the large intestine as such.

A fact that is responsible for the conviction for murder of Ben Ali, in the celebrated "Frenchy Trial" in this city.

These substances were found in the blood taken from the defendant's finger nails, and it was thus reasoned that he must have had his fingers in the small intestine of the murdered woman.

The starches, sugars and fats leaves no residue in health.

An aid to digestion is any agent that

will contribute to the changes that ordinary articles of diet undergo in the human body.

In this connection it is proper to mention foods that from their nature, are most easily taken up in absorption.

Volumes of literature in the form of advertisements and otherwise, have been written on this subject.

The ideal food is unquestionably the milk.

Milk is digested when nothing else is. It is better than any commercial food or combination of commercial foods. Better than beef tea. Beef tea (and I say this in all gravity) is chemically closely allied to urine. Attention was first called to this point by the late Austin Flint, professor of practice of medicine, at Bellevue.

There is now no longer any doubt about it.

Milk contains all the classes of articles of nutrition mentioned above. It even contains iron.

A case that most strikingly illustrates this, came under observation recently.

A man presented himself for treatment, who for a period a little short of eleven years, had lived entirely on milk. He was well nourished, and of considerable muscular development.

Yet, nothing had passed his lips in all these years but milk, of which he drank about five quarts during every every twenty-four hours.

Albumenoids are also most readily changed and undergo absorption more easily than the sugars and fats.

Still, stomach digestion is not by any means the most important. The stomach covered like the mouth, largely assits in the preparation of the food for further changes that take place in the small intestine.

Millions of dollars have been spent in the preparation of pepsin. Still it is of questionable utility. It is of use only in an acid medium, and acts only on one class of food, namely, the albumenoids. By far the greater proportion of albumenoids are converted into peptones by the pancreatic juice, and this is an alkaline secretion, pepsin never reaches the smaller intestine, and would be of no great service if it did.

Pancreatin does not exist as a digestive ferment. Whatever its alleged usefulness may be, it would be necessary to give it in such form that it is not acted on in the stomach, but skips, as it were, this organ and then gets to work in the intestine. (It is claimed that this can be done by coating a pill with certain agents.) In any case it certainly does not emulsify fats, for the reason that this function is a mechanical, not a chemical one.

The chemist has indeed succeeded in preparing articles of diet that lessen the labor of the digestive organs very greatly. In the predigested foods (for instance, Kumyss), there are a large number of these preparations now in the market, and they all have their restricted fields of usefulness.

The pharmacist has also contributed his share to the general good work.

The most distressing accompaniments of defective digestion are fermentation and decomposition. There are many pharmaceutical preparations that tend to lessen these.

Resorcin and salicin, which are soluble, act well in the stomach.

Napthaline and the bismuth preparations are useful, as they pass into the intestines. Of the latter dermatol, or bismuth subgallate, is perhaps the most useful.

If we are to rely alone on the pharmaceutical preparations that are supposed to effect those changes in articles of diet that they normally undergo in the gastro-intestinal canal, we are indeed sadly wanting.

A glance back into the physiology of these changes should make this readily comprehensible.

Indigestion is a grave affliction. It is absolutely incompatable with amiability.

Do not understand me to say that it is not amenable to treatment. On the contrary, care and attention to detail is often productive of very gratifying results.

This procedure does not belong to this lecture. I am to-night only concerned in the description of the physiology of the digestive apparatus and its pharmaceutical aids. From the standpoint of the physiologist, agents that of themselves produce digestive changes in food are of little service.

SYRUP HYDRIODIC ACID.

F. G. HILLS, PH G.

The decomposition which often takes place in syrup of hydriodic acid suggested to the writer the use of glycerin instead of sugar as a preservative. A sample of 4 per cent. strength was prepared according to the U. S. P. method, the solution of potassium iodide, potassium hypophosphite and tartaric acid being made of corresponding greater strength, and glycerin used instead of syrup.

This sample is now over a year old but shows no sign of decomposition, although it has been exposed to both light and moderate heat.

Recently a sample of 5 per cent. strength was prepared according to the following formula, proceeding the same as in the U. S. P. formula for the syrup :

Potassii iodid	gr. lxxvii
" hypophos	gr. ii
Acid. tartaric.	gr. lxxvi
Aquæ	f ℥iss
Dilute alcohol	f ℥ii
Glycerini	q. s. ad. ℥ii

This has been exposed to sunlight and air for about a month, but is in perfect condition. If a preparation of this kind proves more stable than the syrup, it could be used for the preparation of the syrup to advantage.

COLUMBIA COLLEGE LECTURES

IN CO OPERATION WITH THE AMERICAN MUSEUM OF NATURAL HISTORY, 1894 95.

To be given at the Museum, Central Park (Seventy-seventh Street and Eighth Avenue), on Saturday Evenings at 8 o'clock.

Sound.

REGINALD GORDON, A. B.,

Tutor in Physics, Columbia College.

Dec. 1st.-Production and Transmission of Sound Waves. Velocity of Sound in different Media.

Dec. 8.—Characteristics of Strings and Pipes. Interference.

WILLIAM HALLOCK, PH.D.,

Adjunct Professor of Physics, Columbia College.

Dec. 15th. — Overtones, Musical Scale. The Voice.

Dec. 22d.—Resonance, Analysis of Sound. Articulation.

Dec. 29th.—The Ear. Acoustics of the Phonograph and Telephone.

History of Chemistry.

H. CARRINGTON BOLTON, PH.D.,

Non-resident Lecturer on the History of Chemistry, at Columbian University, Washington, D. C.

Jan. 5th.—The Follv and Wisdom of Alchemy.

Jan. 12th.—Paraclesus and the Iatro-Chemists.

Jan. 19th.—The Development of Pneumatic Chemistry.

Jan. 26th.—Lavoisier and the Reformation of Chemistry.

The Vegetable World in its Economic Aspects.

H. H. RUSBY, M. D.,

Professor of Botany, College of Pharmacy.

Feb. 2d.—Food Plants.

Feb. 9th.—Medicinal Plants.

Feb. 16th—Plants of use in the Mechanical Arts.

Feb. 23d—Decorative Plants.

Bacteria and their Relation to Health and Disease.

T. M. CHEESMAN, M D.,

Instructor in Bacteriology, Columbia College. (College of Physicians and Surgeons).

Mar. 2d.—The Bacteria. $\begin{cases} \text{What they are.} \\ \text{What they do.} \\ \text{How they are studied.} \end{cases}$

Mar. 9th,—Bacteria in Nature.

Mar. 16th.—Bacteria in Men and Animals. How they produce Disease.

Mar. 23.—Bacteria and Sanitation. How Bacterial Diseases are Prevented.

The lectures will be illustrated.

Tickets of admission are required. They can be procured, without charge, by application to the Secretary of the President, Columbia College.

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All copy for publication, or changes of advertisements should reach us on or before the 20th of the month previous to the issue in which they are to appear.

All matters relating to publication should be written on one side of the paper only, and sent to the editor,

HENRY KRAEMER, 115-119 West 68th Street.

All communications relating to finances and subscriptions should be addressed to

A. HENNING, Treas., 115-119 West 68th Street

All communications relating to advertising should be addresssd to

A. K. LUSK, 1 Park Row.

THE ALUMNI JOURNAL.

THE managers of THE ALUMNI JOURNAL bid its readers "Greetings for the New Year." As this is the beginning of the second year we are happy to announce that THE ALUMNI JOURNAL is taking the place that was needed and doing the work that was intended to be accomplished by it. We are much encouraged for the coming year's work, and would gladly speak fully of our plans for the year's work. But inasmuch as we have adopted a conservative policy in this respect and as each month passes we feel that we are improving THE JOURNAL we therefore trust that our readers will look into the future for the same improvement as in each issue of last year. We further desire our readers to suggest to us in what manner they consider that THE ALUMNI JOURNAL may be improved.

Pharmaceutical journalism may be considered to be a distinct kind of journalism. It may be divided into two classes, good and bad, but as these are only relative terms like rich and poor we think a better division consists of the following three classes, viz.: (1) Those devoted to original papers and scientific notes; (2) those possessing at least a flavor of (1) and containing a more or less amount of personal and trade notes; (3) publications by the Alumni Associations of some of our colleges. Any one comparing types of these three kinds of publications will see that they are very distinct from each other. Marked differences will be very apparent also in those of the same kind. The first kind is indispensable to the intelligent pharmacist. The second class is necessary to the pharmacist in business. The third class consists of a rather new and undeveloped kind of journalism. The value of an alumni journal, as with any of the other journals, depends upon what its readers desire and what they receive. It is with the latter class that we are concerned.

The prime object of THE ALUMNI JOURNAL is to publish matter of value and interest to the Alumni of the College of Pharmacy of the City of New York and to assist in the work of the College among its members and students. Of especial *interest* to each alumnus are (or should be) the notes regarding the graduates, students and college. The greatest interest is always centered in our "alma mater." To make the department "Our Graduates" what it should be requires the hearty co-operation of all of the graduates of the N. Y. C. P. No editor alone can do justice to this department as he is hardly likely to be in touch with all of the graduates.

The things of *value* to the alumni contained in THE ALUMNI JOURNAL we believe must consist in the original articles which we have printed and propose to continue printing. Our readers see that no articles but those of merit are ever inserted and they may rest assured that none but such will in the future be printed. In the department of "New Literature" each month is to be found a list of new books with brief reviews in some cases. In "The Most Recent Work" we have abstracts from none but first-class journals of the progress contained therein. "Notes Here and There" consist of miscellaneous matter with or without editorial comment, and may consist of answers to queries, etc. Each month an editorial is written upon some subject that is in consonance with the progress of the month and "the signs of the times." These are the things of value and interest to the pharmacist and we are endeavoring to make it also of value to the pharmacist whether he be a graduate of the college or not, and render each volume of sufficient value for binding. The columns devoted to the "Senior and Junior Notes" are not without interest and spice, and the young men ought to be encouraged and certainly have our congratulations for their work. As we are not competent to give authentic trade notes and market prices, which would be a guide to our readers we have refrained from any attempts.

In New York City every one is so busy that very few have any time to do much other than is speedily remunerative. Sentiment might be said rarely enters into any project carried on here. Whatever is done must of necessity be done. The hardest kind of reason and the coldest facts are always demanded. And yet there is probably no place where there is so much interest in reasonable projects that are established and carried on as in New York City. THE ALUMNI JOURNAL is not run as a matter of sentiment or a means of speculation. It is built on reason and run by money. It is going on in spite of anything and anybody. We however thank our friends for their hearty co-operation and encouragement and feel with them that THE ALUMNI JOURNAL can only succeed on its merits. Our motto is *with fear for no one and justice to all we will endeavor to be true to the duties of the hour and produce matter of value and interest to the pharmacist.*

NEW LITERATURE.*

Bacteriology.

The Psychic Life of Micro Organisms.—Alfred Binet. Pages xii., 120. Chicago: Open Court Publishing Company.

La Batteriologia nei suoi rapporti con l'Agricoltura e le Industrie Agrarie.—E. Kramer. Versione Italiana del dott. C. La Marca, con Aggiunte dell' Autore e del Traduttore. Parte I e II. Montecassino. Figurato.

Botany.

Lehrbuch der Botanik.—K. Giesenhagen. München: E. Wolff.

Die Pflanzen des homöopathischen Arzneischatzes.—Bearbeitet medicinisch von v. Villers, botanisch von F. v. Thünen. Dresden: Wm. Baeusch.

A Laboratory Manual in Elementary Biology.—E. R. Boyer. Boston: Heath & Co.

This work is an inductive study in animal

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* Readers desiring any of the works contained in this list can obtain them through B. Westerman & Co., 812 Broadway, Gustav E. Stechert, 810 Broadway, or other foreign booksellers.

and plant morphology and is designed for preparatory and high schools.

Anschauungstafeln für den Unterricht in der Pflanzenkunde.—Pilling und Müller. Braunschweig: Fr. Vieweg und Sohn.

Die wichtigsten ausländischen Culturpflanzen.—Material zu naturgeschichtlichen Unterredungen auf der Oberstufe mehrclassiger Volks und Bürgerschulen. Zugleich eine Erlaüterung zu Göhring-Schmidt: Ausländische Culturpflanzen.—H. Tewes. 2 Aufl. Leipzig: F. E. Wachsmuth.

Pflanzen-Teratologie, systematisch geordnet.—O. Penzig. 2 Bd. Dicotyledones, (Gamopetalæ), Mononocotyledones, Cryptogamœ.

Beiträge zur Kenntniss der Gallenbildungen mit Berucksichtigung des Gerbstoffes.—Max Küstenmacher. [Aus "Pringsheim's Jahrbüchern für wissenschaftliche Botanik."] Berlin, 1894. Gebr. Bornträger. 8vo., 104 pp. Mit 6 Tafèln.

Chemistry.

Notes on Reactions of Salts, and Scheme for the examination of a solution of a single Salt.—Class ot practical chemistry, University of Edinburgh. Thin (Edinbugh): Simpkin.

Roscoe-Schorlemmer's kurzes Lehrbuch der Chemie nach den neuesten Ansichten der Wissenschaft.—H. E. Roscoe u. A. Classen. 10 Aufl. Braunschweig: Fr. Vieweg u. Sohn.

Synopsis of Advanced Chemistry.—W. J. Stainer. London: Clive.

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Experimentalphysik.—von Lommel. 2. Aufl. Leipzig: J. A. Barth.

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THE MOST RECENT WORK.

The New Publication.—*The Pharmaceutical Journal and Transactions* (1894, 380), recently inadvertently credited an article to a certain American publication, in which it appeared as original matter. The editor subsequently learned, however, that this article was original in another American journal, the one having given no credit to the other when it was due. The editor of the *Pharmaceutical Journal and Transactions*, in speaking of his own innocence in the matter, and regret for inadvertently giving credit when not due, says also: "Such venial errors are at times unavoidable in the face of the peculiar system followed by many editors, who seem to prefer to take responsibilities they have not incurred rather than quote the source of their 'original' articles, translations and abstracts. In pharmaceutical journalism we are probably the greatest sufferers by this practice, which is indulged in much too freely by some of our transatlantic contemporaries. Whilst only too pleased to find our subject matter regarded as of sufficient importance to be worthy of more or less extensive reproduction, we venture to submit that it is not too much to expect proper acknowledgment to be made in every instance. In such cases as the one which has given occasion for the publication of this note, apologies are due to those who are misled by the omission to furnish such acknowledgment, no less than to the original publisher of the information. It may occasionally happen, in the pressure of business, that the omission is purely inadvertent, but it is pitiful, to say the least, to see that journals claiming reputation persistently and continually ignore the most elementary notions of courtesy and honesty."

Spike Oil.—One part by volume of spikè oil must give a clear solution with 3 parts of alcohol of 70%, at a temperature of about 20°.—*Schimmel's Report*, Oct., 1894.

Hydrogen Dioxide.—E. L. Patch (*Amer. Pharm. Assoc. Proc.*, 1894).

The statement has been made by different authorities that a remarkable difference exists in the medicinal value of Hydrogen Dioxide and its stability.

Some assert that they get best results from a concentrated solution obtained by evaporating the official 10 volume solution to one-third its volume, producing a 30 volume strength.

Others pronounce such a product as worthless. This has led to a series of experiments.

Using the U. S. P. 1890 process and cold water only, 6,000 Gm. Barium Dioxide yielded an average for three lots of 13,000 Gm. of 10.5 volume solution.

Using an ice bath, the same quantity of material gave an average for three lots of 16,700 Gm. With extra care 17,500 Gm. were obtained. These assayed 10.5 volumes, and were far within the requirements for residue and acidity.

The following table gives the character of these products :

	Volume strength.	Residue on evaporating 10 Cc.	$\frac{N}{10}$ Alkali required to neutralize 10 Cc.
U.S.P.Stand'rd	10.	0.050	1.00
Lot 1	10.4	0.008	.75
2	13.44	0.040	1.00
3	15.34	0.028	1.30
4	12.67	0.005	1.00
5	9.97	0.007	.80
6	10 00	0.018	1.00
7	10.13	0 008	1.00
8	10.75	0 012	1.00
9	11.30	0.008	1.00
10	12.48	0.006	1.00
11	13 38	0.008	1.00
12	10 05	0.011	1.00

The following table gives the assay of several samples of Barium Dioxide :

1.	91.6 per cent.	5.	80 per cent.
2.	76.4 "	6.	82 "
3.	86.8 "	7.	80.4 "
4.	93.6 "	8.	79.6 "

The following table gives the result of examination of market samples :

Commercial.	Volume Strength.	Residue from 10 Cc.	$\frac{N}{10}$ Alkali for 10 Cc.
1	2.47	excess	excess
2	8.80	"	"
3	10.	"	"
4	7.3	"	"
5	8.5	"	"
6	10 8	"	"
7	10 4	"	"
8	9 1	0.040	5.00
9	10 4	0.020	4.00
10	10.7	0.008	1.50
11	10.75	0 008	5.50
12	10 5	0 007	3.00
13	13 3	0 008	2.80
14	10.8	0.005	3.20
15	10.2	0 005	3.40
16	10 3	0 003	3.70
17	11 3	0 005	3.40
18	9 2	0.006	3.20
19	9 2	0.250	3.80
20	9.1	0.008	5.
21	8.5	0.020	3.50
22	9.9	0.015	5 50
23	14.7	0.022	5.
24	7.7	0.022	7.00
25	7.3	———	46.00
26	5.1	excess	excess
27	4.9	"	"
28	7.7	0.020	7 00
29	8 79	0.16	5.00
30	8 9	0.037	7 50

Medicinal.	Volume Strength.	Residue from 10 Cc.	$\frac{N}{10}$ Alkali for 10 Cc.
1	9.5	0.060	2 5
2	11.31	0.009	.8
3	10.86	0.012	.75
4	8 17	0.015	.8
5	9.63	0.018	1 00
6	11.00	0,007	.75
7	12.71	0 021	2 5
8	12.15	0.012	.5
9	12.2	0.005	.6
10	10.15	0.020	1.15

The following results were obtained by evaporation of different samples :

1. Commercial—assaying 8.8 vol., excess of acid. Evaporated at low temperature with constant stirring. 200 Cc. to 130 Cc. assayed 9.1 vol. Continued to 15 Cc. assayed .22 vol.

2. Commercial—assaying 7.5 vol., 200 Cc. to 100 Cc. assayed 9.8 vol. Continued to 60 Cc. assayed 9. vol.

3. Medicinal—assaying 10.86 vol., deficiency of acid. 300 Cc. to 75 Cc. gave 41.66 vol., should be 43.44 vol., loss 1.78 vol.

4. Medicinal—assaying 8.17 vol., 100 Cc. to 26 Cc. assayed 31.2 vol.

5. Medicinal—assaying 9.9 vol , 200 Cc. evaporated to 15 Cc. diluted with distilled water to 50 Cc. assayed 25 vol., loss 14 6 vol. or about 37 per cent.

6. Medicinal—assaying 9.9 vol., 200 Cc. allowed to stand open 36 hours then evaporated to 50 Cc. assayed 26.86 vol., loss 12.74 vol. or about 32 per cent.

7. Medicinal—assaying 9.9 vol., 200 Cc. evaporated quickly to 50 Cc. assayed 34.35 vol., loss 5.25 vol. or about 13 per cent.

A reagent for Morphine.—Lamol recommends uranium acetate as a reagent for the detection of morphine. 0.05 Gm. of morphine giving a distinct reaction. This reagent strikes a red-brown color with a solution of morphine disappearing on addition of an acid. The addition of a small amount of caustic alkali causes an intense red-colored precipitate, while a large excess gives rise to a yellow precipitate. A few drops of the solution to be examined for morphine is placed in a porcelain capsule, to this is added an aqueous solution which contains 0.3 per cent. of uranium acetate and 0.2% of sodium acetate, then evaporated to dryness. The presence of morphine will be shown in the brown to bright yellow-colored rings in the residue, while other alkaloids leave white or pale yellow rings.

V. C.

Scopolamin.—Prof. E. Schmitt has assigned the formula of $C_{17}H_{21}NO_4$ to this alkaloid, which is found in the root of the Scopolia Atropioides, and in the leaves of the Duboisia myropoides, in the seed of the Hyoscyamus Niger and Datura Stramonium, and the root of the Atropa Belladonna. This author has shown that Merck's Hyoscynium hydrobromicum, Ladenburg, consists essentially of Scopolamin. This author was unable to find the alkaloid Hyoscin $C_{17}H_{23}NO_3$ the isomer of Atropine and Hyoscyamine. Merck's Hyoscinum hydroiodicum verum, $C_{17}H_{23}NO_3HI$ is according to Schmitt Scopolamin Hydriodide $C_{17}H_{21}NO_4HI$.

V. C.

Proteid Poisons—Proteid poisons have been obtained from both the vegetable and animal kingdoms. Thus, among those obtained from plants one may mention the proteids obtained from jequirity seeds, the proteid associated with or identical with the ferment papain of the papaw plant, and lupino-toxin from the yellow lupin.

The most important of the animal proteid poisons are snake poisons, the proteids in the serum of the conger eel and other fish, and proteid poisons found in certain spiders. Poisonous proteids are also formed during ordinary digestive processes in the alimentary canal of every one of us from the proteids taken in as food. The peptones and proteoses or albumenoses (intermediate products in the process of hydration of which the terminal product is peptone) are fairly powerful poisons. 0.3 Gramme per kilogramme of body weight injected into the blood will kill a dog, producing a loss of coagulability of the blood, a fall of blood pressure, a stoppage of secretions, and ultimately death by cessation of respiratory activity. Normally animals are protected from this poison by the lining membrane of the alimentary canal, so that no proteose or peptone is found in blood or lymph even during the most active periods of digestion. The cells of this membrane possess many remarkable properties, but one of the most important is this power of regenerating albumen from peptone.

Allied to the albumoses of ordinary gastric activity are the similar products produced by bacteria. The way in which bacteria produces disease has long been a matter of dispute, but the problem appears to be approaching solution. Pathologists have at last turned their attention to the chemical side of the question, and shown that whereas in some cases the poisons produced by the growth of micro-organisms are alkaloidal in nature, in by far the greater number the toxic product is a proteid. The one which is best known, or at least attracted most attention, is the toxalbumose contained in Koch's tuberculin.

The foregoing list is far from complete, but one cannot conclude it without mentioning another class of proteid poisons. These are the nucleo-albumens obtainable by suitable methods from most of the cellular organs of the body. Originally discovered by Woolridge, they were named by him tissue-fibrinogens, because they possess the remarkable power of producing coagulation of the blood within the blood-vessels of a living animal. A very small dose will kill a rabbit or a dog, and death is as a rule produced by extensive clotting within the vessels, especially in the veins. Under certain conditions, however, especially in the dog they produce the opposite result, namely, a loss of coagulability similar to that produced by peptone. Woolridge termed this the "negative phase of coagulation."

A practical outcome of all this work is the discovery of alexines or protective proteids. These appear to belong to the nucelo-albumen class also. In smaller doses they confer immunity on animals to larger doses of similar poisons, and thus the long hidden secret of the *modus operandi* of vaccination and other forms of protective inoculation is at last beginning to be unravelled —*Pharm. Jour. Trans.*, 1894, 376. Extracted from an article on "snake poison," by W. D. Halliburton, in Science Progress, Sept., 1894.

New Remedies.

Antitetraizin.—This is a chinin derivative recommended by Zambeletti (Milan) in the treatment of rheumatic and neuralgic pains, influenza, etc. The dose is 0.2-0.25 Gm.

Cadmium Salicylate.—This is prepared by reacting between molecular quantities of salicylic acid and cadmium carbonate in the presence of water. The salt is soluble in 24 parts of boiling and 68 parts of cold water. It is likewise soluble in alcohol, ether and glycerin.

Calcium Borate is obtained by mixing solutions of borax and calcium chloride. This is employed as an antiseptic wash ; it is likewise administered internally in doses of 0 3-0.4 Gm. in treatment of infantile diarrhœa.

Chloroiodolipol. — A chlorine substitution product of phenol, creosote and guaiacol, recommended by Zambeletti for inhalation in treatment of diseases of the air passages.

Collasin is said to be a solution of soluble gun otton and camphor in acetone. It is employed or the same purposes as collodion.

Traumalol (*Iodocresol*).—This is proposed as substitute for iodoform. It is prepared by dding a solution of iodine in potassium iodide n an emulsion of creosol in water. Traumalol orms an insoluble inodorous reddish colored owder.

Basic Bismuth Tartrate. — [$C_4H_4O_6.2$ Bi $OH)_2$]. To two molecules of bismuth hyroxide made into a paste with water, one nolecule of tartaric acid is added, the product s then evaporated to dryness on a water bath.

Cadmium Salicylate [($C_6H_4OH.$ $COO)_2$ Cd.] -Cadmium hydroxide and salicylic acid are eated together in molecular proportions in the resence of water, until reaction is over, the esulting solution should have a slight acid eaction, adding, if necessary, a little more alicylic acid. The solution is then evaporated nd crystallized. This body forms a crystalline olorless powder, of sweetish astringent taste, oluble in 68 parts of water, more so in alcohol, ther and glycerin. The antiseptic action of his salt is more marked than in the other admium compounds.

Salifebrin or Salicylanilid.—This is a combiation of acetanilid and salicylic acid, patented y Radlauer. It is probably prepared by fusing oth substances together and powdering the esulting mass. Salifebrin forms a white powder which is insoluble in water, and soluble in lcohol. Nothing definite is known concerning ts dose.

Sublimo-phenol.—This is a mixture of mercuic chloride and phenate, obtained by mixing nolecular quantities of potassium phenate and nercuric chloride in aqueous solution, the preipitate formed is at first of a reddish color, hen, finally white ; after washing it is crystalized from alcohol. The crystals melt at 210°C.

Bismuth Subsalicylate.—B. Fischer recommends the following process : one molecule ach of salicylic acid and freshly precipitated bismuth hydroxide are heated together with the necessary amount of water on the water-bath, ilter, collect and dry the residue at 80° to 100° C. on porous tiling.

Lithium Salicylate.—A mixture of 37 parts of lithium carbonate and 138 parts of salicylic cid are warmed together with a little diluted lcohol, until the reaction is over, the resulting product should have a slight acid reaction to itmus, this is then evaporated to dryness.

Salactol.—This is a solution of sodium salicylate and lactate in a 1% hydrogen peroxide solution ; it has commanded considerable notice as a valuable remedy in the treatment of diphtheria. Salactol is applied to the throat by means of a brush every four hours, between times it is used as a gargle, being diluted with an equal volume of water. In case of children or such patients where gargling cannot be resorted to, the vapors of the solution are inhaled. V. C.

NOTES HERE AND THERE.

American Pharmaceutical Association.—Prof. Edward Kremers in *Pharm. Rund.*, 1894, 287.

"The American Pharmaceutical Association at its meeting in Asheville, N. C., in September last, thought it best to ward off any suggestions of mistaken identity with the American Protective Association by changing the customary abbreviation of A. P. A. to A. Ph. A. That the initials might court an odius impression between the two associations possibly did not occur to any member of the Association at the time the action was taken. It certainly did not occur to the writer until very recently. Not that there are any political or dogmatic relationship between the two, but the attention of the writer has recently been very forcibly called to the fact that the American Pharmaceutical Association has offered and still offers *protection* to a class of men that is as odius as the tactics of American Protective Association or of Tammany Hall. This is all the more to be regretted because the American Pharmaceutical Association is not a political, but claims to be a scientific and professional organization, and because the larger interests of the Association itself and of American pharmacy, in general, must suffer from such a policy.

"Since the motto (quantity not quality) has become the guiding principle in the proposals and election of new members, the supports of the mediocre element of the Toms, Dicks and Harrys of so-called pharmacy has been courted, and this same element has found protection in the Association. Not a few of the most eloquent men of American pharmacy, have, in recent years, been conspicuous at the annual meetings of the Association by their absence. On the other hand, the chairman of the various sections have been begging all around for, and greedily accepting, paper upon paper, each one with the ambition of outstripping his former colleague in the *multitude* of papers presented to his section.

When such motives underlie, it can surprise no one that the sessions of the Association are largely taken up with the discussion of papers of questionable merit, and that the proceedings of the Association contain much of doubtful value. In giving so much time to the discussions of such papers, and in printing the same in its proceedings, the Association protects mediocrity and sustains the poor opinion held of American pharmacy abroad.

"The *Pharmaceutische Rundschau* has not infrequently and always truthfully pointed out this and similar fallacies, but on the whole, it stands alone in its generous and fair criticisms, and has been decried as unsympathetic and hypocritical for venturing to plainly express its opinions and convictions. It was somewhat refreshing therefore, to see the editor of the *American Journal of Pharmacy*, (Oct., 1894, p. 494) call the attention of the Committee of Publication to its duty of rejecting worthless papers."

The above remarks of Prof. Kremers are very pertinent and indeed to the point. The Association can and must meet the present condition, of which the author speaks, in only one way and that is by the *hearty co-operation* of those who are able by training and culture coming into the Association and rendering all possible assistance. The hightest tribute paid to the late Prof. John M. Maisch is contained in the closing lines of the memorial to him in the Proceedings for 1893, and is well worthy of repetition here ; " With rare wisdom, and without sacrificing truth, he believed that he could accomplish more good, and serve the best interests of all more devotedly, by endeavoring to guide those who looked up to him as a leader in correct paths, without denouncing them for their inability to realize his ideal." In a political way in New York we are realizing the great lesson of the closing years of the present century, and that is for strong men—men of character and ability—to accept the offices of trust and for good men to support their leaders. If the good men continue in their efforts there will be no Tammany Hall to speak of soon, and so if the able bodied men of American Pharmacy will assist more in the discharge of the affairs of the American Pharmaceutical Association and teach and labor for " quality and not quantity," there can be no grounds for such criticisms.

There seems to be an impression going around that the President of the American Pharmaceutical Association ought not to recommend to the Association measures that he may consider desirable and valuable. It seems to us, on the other hand, impossible for the President of any association to avoid recommending measures (if he has conceived of any) for their adoption. The precedent, instead of being questionable, is in our opinion commendable. Very few Presidents either prepare or have prepared for them addresses other than are the result of research and study. The benefit of this work is manifested in suggestions and recommendations to the body before whom the address is given. We do not believe much in precedent, however. We believe in every man doing what he considers best. No man should lose an opportunity like this for doing his very best. Had the Committee who considered the President's address at the Asheville meeting been fully aware of the importance of " Pharmaceutical Fellowship" to the Association, it is highly probable that measures would have been devised for the establishment of this institution, although there is no question but that they did what they considered best for the financial interests of the Association at that time. The recommendations of President Patch were in consonance with the other portions of his address.

Senior Class Notes.

At meeting held Wednesday, December 12th, 1894, H B Ferguson, Vice-President in chair, the following business was transacted.

Minutes of previous meeting read and accepted.

CLASS PIN.—This matter which was held over from previous meeting was acted upon as follows; " That two of the ten proposed designs be selected, and that one of each of the two be made up in enamel, gold, etc., just as they are to appear as a Class Pin."

Nos. 2 and 7 were finally selected, and are to be designed accordingly and exhibited.

PHARMACY LECTURES.

MOVED, seconded and carried that a resolution be presented to Prof. Coblentz, or the Lecture Committee to have the Pharmacy Lectures delivered in the Lecture Room on account of noise and inability of many of the students to see the work on the blackboard.

Messrs. Morse, Gies and Steinheur were appointed by the chair to act in the matter.

AT a meeting held Wednesday, November 28th, 1894, 5 p. m., J. I. Bailey, President, in the chair, the following business was transacted.

CLASS PIN.—The adoption of a new design

was referred to the following meeting, to be held subject to call.

CLASS FLAG.—Mr. R. Gies on behalf of the Committee, reported that design had been decided upon, which design would cost $1.00 per flag. He stated up to that time 65 flags had already been subscribed for.

GLEE CLUB.—Mr. R. Gies reported that 27 members had been enrolled, that the average attendance was then 17 or more, and that everything promised well.

He also stated that the Committee's work was completed and asked that they be relieved of further duty, which request was granted by consent of the meeting.

The meeting was regularly adjourned.

T. P. HEFFLEY, Sec'y.

DR. HAUBOLD'S lecture on December 12 brought out a large number of members of the senior class, who were conspicuous by each man present bearing one of the new pennants on a cane. After the learned doctor, who places himself on record as having little or no faith in the much vaunted value of pepsin applied as a remedial agent in indigestion, and who places the greatest amount of belief in the value of milk for the same complaint, after he had finished his interesting lecture, the representatives of the class of '95 marched from the College in a body and serenaded the druggists on the Avenue from 66th street and Columbus avenue down Broadway to 23d street.

MESSRS. R. GIES, R. O. Belfry, T. A. Merritt and H. E. Cooley passed the State Board examination on the 30th ult.

A NUMBER of the students of the class of '95 took the City Board's examination on the 12th inst. and at the time of going to press the results had not yet been announced. The successful members will be named in our next issue.

THE committee having in charge the production of the pennant, have after a little difficulty succeeded in presenting to the contributing members a very neat pennant, of a blue color, triangular in shape and bearing a design of the Benzole ring with the college colors and the figures '95 indicating the class. The material is silk.

IN the foot ball game between the L. I. C. H. team and the Coll P. & S. team, the Embryo-Æsculapii of the College of Physicians and Surgeons of New York, after a hard and exciting tussle with their Long Island competitors, were declared victors, much to our delight. It is only fair to add that the Long Island College team has some strong men among them, who made the P. & S. boys work for their honors.

The glee club still continues in a flourishing condition, and we hope will remain so. It takes works to become perfected in anything, this being no exception.

The quizz class is a decided success. The work of Mr. Ferguson as quiz-master, last Friday night, December 14, should be especially commended.

Davey Wells, whose long face for the past week, has been the subject of much anxiety among his friends, has quieted their fears by resuming his usual jolly manner,

Manville had a little 'tash,
With which he used to mash,
And every time he went to eat,
It got mixed up in the hash.

It followed him to the barber shop,
And sinc- then he has wept,
For the barber quickly cut it off
While Manville sweetly slept.

Cruel scissors. Inhuman barber. Sherman's curley locks, alas !

At the meeting of the quintette club last Friday, Braves Engle, Morse, Manville and Cherry were introduced into the mysteries of Fire Damp Lodge, Section 1.

One of our glee club members, who works at a well-known Broadway establishment, while at dinner was noticed by a lady opposite to put three spoonsfuls of sugar in his tea. You must be sweet, she said. I am, he replied. If you don't believe it, try me. Hey ! Sherman. The enthusiasm displayed by the boys in the purchase of flags, speaks well for the various enterprises in which they have embarked.

The glee club was entertained by Mr. and Mrs. Gies, at their pleasant home, on Twenty-eight street, Monday night, December 10.

All report a very pleasant and enjoyable evening. Mrs. Gies, the handsome and charming wife of our musical director, proved to be a charming hostess.

President Bailey's untiring labors in the interest of the class should meet with its hearty co-operation. The outbursts of the three or four toughs which have given the seniors a bad odor for the last two years, are ended it is hoped.

For Burns, use your liniment.
Gies, for Christmas.
Cherry rum for sale.
Oats, not wild, we hope.
Herrings, mum from our college list.

FRANK BANNON,
FRANK CHAMBERS,
Reporters.

Junior Notes.

THE Junior Class held their first meeting Oct. 20th. Mr. Thornhill was elected temporary Chairman and Mr. Cantwell, Secretary. It was decided that each section elect a delegate ; they, with Mr. Thornhill as Chairman, to form a nominating committee. At the next meeting the nominations were presented, but owing to the inclemency of the weather, the election was postponed until Nov. 20th. On this date the election resulted in 126 votes being cast ; the following officers being elected : *President*, S. Thornhill, Wappinger Falls, N. Y.; *Vice-President*, G. H. Carter, Newburgh, N. Y.; *Secretary*, F. H. Finley, 62 W. 34th St., N. Y.; *Treasurer*, G. Norcross, Far Rockaway, L. I.; *Reporter*, J. Y. Cantwell, Davenport, Ia.

THE present Junior Class is the largest that ever entered the college. There being representatives from South America and Europe, as well as from all parts of this country,

THE new college pin which C. M. Rawlins has for sale is quite an improvement on the old, the difference being the letters N. Y. C. P. across the face.

How many Junior students have visited the Students' Club at 129 Lexington avenue? If you have not, you ought to do so.

This club is the only intercollegiate one of the kind in the city, it being made up of 26 colleges, N. Y. C. P. being one of them.

Here it is that the various college students meet. During the winter receptions are given, and the members have many social enjoyments. On November 17th Mrs. Dr. Shrady gave an opening reception to the members and friends of the club. Bishop Potter, Mr. McArthur and Mr. N. M. Thompson made addresses, while eminent musicians, the Columbia Glee Club and the Princeton Quartette, helped entertain the students. Not only are there social enjoyments, but reading room, gymnasium privileges and baths. Many students room in the building. The Secretary, Mr. E. E. Hunt, is a friend of all college men, and sends a cordial invitation to all N. Y. C. P. students to make him a visit at the club.

Prof.—What does ex. mean ?
C.—To carry out,
Prof.—No.
C—Oh ! express.

A favorite query in the Chem. Lab. Shall get you a rattle ?

THE Juniors decided by a vote of the class that school should open January 8th, at eight A. M. Tuesdays work being done in the morning, and Thursdays in the afternoon as usual.

They say C.__is Dichlamydeous.

As qualitative analysis was started last week, we may look for some wonderful discoveries soon.

As soon as we finish physics. which will be sometime in January, we will have our first examination, this will be the only one the Juniors will have until the end of the year.

PROF.—Is HCl an alkali ?
H.—Yes, sir.
PROF.—And how would you make it more alkaline ?
H.—Add more HCl.

ASK C. W. S. how Fl. Ex. of Genatian tastes.

PROF.—How many yards of oil cloth will it take for a room 18x28 ?
F.—Answered, what kind of cloth, Prof. ?

At the last class meeting committees were appointed to select a class yell, and to see about a reception at the Student Club rooms.

A banjo club has been organized, now for a Glee Club.

All communications for Junior column should be addressed to

J. Y. CANTWELL, 261 W. 42d Street.

THE JUNIORS.

A gayer set could ne'er be found
In either town or city,
Always for mischief they are bound,
And such noise !—'Tis a pity.

The lecture room is where they cheer,
And where they are choked with dust.
'Tis strange how the ceilings adhere,
But of course they say it's just.

Their hands are skinless, burnt and fried,
By testing acids or gas,
But of course they never once cried—
Some may, when they fail to pass.

"Pharmacognosy is a snap,"
You'll hear a few of them say,
But don't meet with any mishap
On examination day.

And now they're going to take a rest,
On Christmas turkeys survive ;
But be quite sure that they digest,
And get back in '95.

—G. C. PATRICK.

OFFICIAL OPENING

OF THE COLLEGE OF PHARMACY OF THE CITY OF NEW YORK.

The formal opening of the new college building took place on Friday evening, Dec. 28.

On their arrival, the guests were received by a committee consisting of Messrs. J. N. Hegeman, Chairman; Chas. E. Holzhauer, Dr. Adolph Tscheppe, George Massey, Albert Plaut, Dr. Chas. Rice, Wm. J. Schieffelin, Theodore Louis, Horatio N. Fraser, Herman Graeser, Thos. F. Main.

They were shown to the cloak rooms; the ladies to the committee room on ground floor, where Mrs. Schuyler was in attendance, and the gentlemen to the basement, where provision had been made for them.

As soon as the garments had been removed the guests were ushered to the lecture room, by a committee for that purpose, consisting of the following members of the Alumni Association: Messrs. H. Graeser, C. F. Keale, Wm. A. Hoburg, Jos. R. Wood, A. A. Kesseler, J. H. Wurthman and H. Krueder.

Previous to the beginning of the exercises the band, placed on the upper landing of the lecture room, rendered some excellent numbers, which were highly pleasing to the guests, after which the members of the faculty and special guests were escorted to the platform from H. Rusby's chart room, where they had assembled.

The exercises were then opened with an invocation by the Rev. Madison Peters, D. D.

Mr. Hermon W. Atwood, Chairman of the Building Committee, presented the finished building to the Chairman of the Board of Trustees, Mr. Samuel W. Fairchild with a short address.

In accepting the building, Mr. Fairchild thanked the committee for their earnest and conscientious work, and after a lengthy and very interesting speech introduced Dr. George Shrady, the speaker of the evening, whose remarks were indeed very enjoyable.

Dr. Chas. F. Chandler was then asked to make some remarks on behalf of the faculty, which he did in his usual interesting manner.

This concluding the exercises the guests made their exit through the south doors and inspected the various departments where the respective professors were in attendance, and the Museum where the officers and trustees held a reception, passing from there to the Department of Botany and Materia Medica, where Dr. Rusby and Dr. Jelliffe were in attendance, then to the Department of Pharmacy, where Dr. Coblentz and Mr. Madison explained the curriculum to the guests, and finally the Department of Chemistry, where Drs. Elliot and Ferguson were in attendance.

From here the guests passed down the north staircase, inspecting the Alumni Room, where a presentation had been made by Mr. A. Henning, and where the president, Mr. Herman Graeser, and members of the Executive Board were in attendance.

After this the guests were ushered to the Assembly Rooms and Library on the main floor where a collation was served. The music having been removed from the Lecture Room to the main floor to play during the collation was so exquisite that the younger people could not resist the temptation and a dance was instituted in the library and all present had a merry time.

Editor ALUMNI JOURNAL:

DEAR SIR—A number of the students do not understand the extent of the recognition of the College diploma by the State Board of Pharmacy. Will you kindly publish in the next issue of THE ALUMNI JOURNAL an answer as to whether it is necessary to pass another examination in New York, Kings and Erie Counties, or simply to become registered sufficient.

CLASS OF '95.

This query was handed to K. C. Mahegin, whose reply is as follows:

"The diploma of the College of Pharmacy of the City of New York is recognized in New York State in the counties of New York, Kings and Erie.

Applicants for registration in all parts of the State, whether graduates or not, must be examined by the State Board."

MEETING OF THE TORREY BOTANICAL CLUB IN THE COLLEGE OF PHARMACY

THE regular semi-monthly meeting of the Torrey Botanical Club occurred on Tuesday evening, December 11, in the lecture room of the New York College of Pharmacy by special invitation and proved a very pleasant and successful event, in spite of the extreme inclemency of the weather. About fifty persons were present. The paper of the evening was read by Prof. Rusby on the subject of "Pharmaceutical Botany." The speaker referred to the different points of view from which the two hundred members of the Club viewed the study of botany. Most of them pursued for the recreation and culture which it afforded, quite a number pursued as a pure science, and most of the remainder from the standpoint of the teacher. The speaker was almost alone as one whose professional relations lay entirely with the economical side of the question. He therefore felt that it would be of great interest as well as profit if the other members of the club were to gain some general knowledge of one of the important departments of the latter subject. The development of the science of botany from medical botany was briefly outlined, and the circumstances and changes reviewed which had led subsequently to the separation from medical botany of the branch now known as pharmaceutical botany. Regret was expressed that the former subject had not maintained its position as it properly should, having almost entirely abandoned the field to the latter, which should properly constitute but a collateral branch. The objects of pharmaceutical botany were then stated to be chiefly the identification and selection of vegetable materials used as drugs. These materials were mentioned as being roots, stems, including rhizomes, tubers, bulbs, herbs, twigs and woods, barks, leaves, leaflets, flowers, fruits and parts thereof, seeds, glands, trichomes, excrescences, secretions and excretions. In performing these tasks of identification and selection the pharmaceutical botanist unfortunately rarely has access to complete specimens , and does not often in fact have even such material as the ordinary botanist would deem absolutely essential for the purpose. Seventy-five per cent. probably of the material comes to him in a powdered condition, and a large part of the remainder more or less crushed or broken. At the same time stress was laid upon the great importance which frequently attached to correct results, as matters of life and death, effected some times by active interference, some times by neglect of reatment, was the issue.

Under these circumstances it is clear that special methods have to be resorted to. These These methods were then explained and illustrated by a large number of similar drugs which might be mistaken for one another, the specimens being passed around among the audience lying side by side in boxes. After these had been inspected, pictures were projected upon the screen by the oxy-hydrogen lantern, showing the points of minute structure upon which dependence frequently had to be placed.

The exhibition was not only highly instructive, but was very beautiful, Mr. Madison managing the lantern with unusual care and skill.

After the adjournment, the members, a large number of whom were teachers in public and private schools of the city and vicinity, were invited to inspect the building and teaching methods and apparatus, which they did, a number of them remaining until a late hour.

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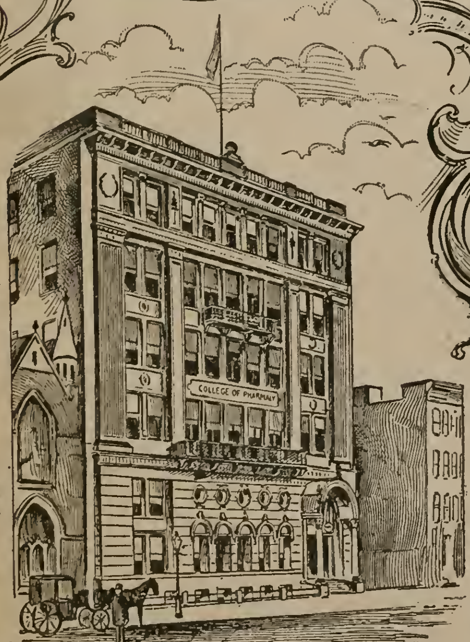

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"THE RISE AND PROGRESS OF PHOTOGRAPHY."

BY PROF. ARTHUR H. ELLIOTT, PH.D., F.C.S.

THE topic of my lecture this evening is one of my old hobbies, so that if I am a little prolix sometimes you must pardon me. It is something in which I have been more or less interested for the last twenty-five years, and, like most of our hobbies, we sometimes drive them to death, to the discomfort of other people.

The fundamental ideas upon which photography is based are very old—older than the Christian era, certainly. They depend upon two facts: First—that light, in passing through a small opening, produces an inverted image in a dark chamber. Imagine, for instance, that you are in a dark chamber, outside of which is an object; that there is in the chamber a small hole a sixteenth or an eighth of an inch in diameter, and that you have in this dark chamber a piece of paper. Upon that paper you will get a picture of the object opposite the hole. That was known a long time ago. The other fact is that certain salts of silver, notably the chloride, iodide and bromide of silver, are sensitive to light and become blackened by light, was known to the Egyptians. The action of light upon colored bodies must have been known to the very earliest observers among men. The bronzing of the human skin under the tropical sun must have been noted by every one; and it is on record, in the most ancient annals of the human race, that men—the fair men from the North—when they went to the tropics, returned with tanned skins. Ptolemy, over two thousand years ago, noted that beeswax was bleached in sunlight, and the old Greeks noted that the gems which we call opal and amethyst lost their colors when exposed to sunshine. These are some of the first and most rudimentary notions upon the actions of light, and we have no definite statements about making pictures without light. The Chinese have a tradition—and they have a great many curious ones that are often founded on facts—that the sun makes pictures upon the ice of lakes and rivers.

A Frenchman, named Fontamen, wrote an imaginary voyage to a strange country, and among other things he said that objects were reflected upon the water and when the water was frozen the images were retained. So this idea of certain surfaces being capable of receiving impressions by means of light was very ancient. There was another Frenchman, named Devique Delaroche, who made a still more curious statement. In 1760 he wrote a book in which his hero is wrecked upon a strange coast, and the spirits of that place showed him how to make pictures, as he called it, "painted by nature." It is not quite sure what he means, but his words are something like these: "You know," says his guide, "that rays of light are reflected from different bodies and form pictures. The spirits have sought to fix these pictures, and have a subtle matter by which these pictures are formed in the twinkling of an eye. They coat canvas with this peculiar matter, and hold it before the object." The manner of holding it is not stated. "The canvas is then removed to a dark place and in an hour the impression is dry and you have a picture, the more precious in that no art can imitate its truthfulness." These words were written one hundred and fifty years ago. This, as far as we know, was purely imagination; yet the idea—the germ of photography—was there. We shall presently see that this flight of fancy on the part of Delaroche was very near the truth, and foretold what has since become possible, and only a very short time after he said it.

As time went on and observations of men became more definite, we obtain records of facts that were noted with regard to the action of light upon certain chemical compounds. You know those old alchemists had queer ideas, one in regard to their elixir of life, and another that they could turn the baser metals into gold. They discovered a material in the silver mines of the Hartz Mountains which they called "luna cornea." The word luna was at that time applied to silver. Luna cornea was horn silver—what we know to-day as silver chloride. They noted that when this was first brought from the mine it was white and that after it had been exposed to the air and the sunlight it turned black, and they also noticed that it was only the surface that turned black—that if they scraped the surface off it was white underneath. They also found that if they kept it in the mine it did not get black. This observation was made about 1550 by Frobrishes, one of the early workers in chemistry; but you must remember that they were not studying the action of light upon this substance. Their sole object was the turning of the baser metals into gold, and therefore they did not pay much attention to this idea, although this fact was placed on record.

Some time after this we learn that a German named Schultze made copies of drawings with a mixture of chalk and silver nitrate spread on a level surface. The time of this is doubtful, but it was probably about the year 1700. He passed the light, as he says, through translucent paper (made translucent with oil or wax), and objects placed upon the paper left a white impression on the mixture of chalk and silver nitrate—or, as he called it, "lunar caustic." This was in about 1700, as I said. About fifty years after this time (and indeed it was a little more, it was seventy years, in 1777) Scheele, the Swedish apothecary's assistant, took up the examination of this horn silver. It seemed to him well worthy of study; and as the result of his work he obtained the first germs that led to the art of photography. But before Scheele could have prosecuted his researches, and before photography could make any important advances, there were two other discoveries in science—and in optics particularly—that had to be made. The first of these was the decomposition of white light, by Sir Isaac Newton, by which he obtained the prismatic colors; that is to say, the colors that we know as violet, indigo, blue, green, and so on down to the red. That was the first step. The next step was the discovery by Baptiste Porter, an Italian, in Naples, which preceded the discovery of Newton (it was about 1590), that a small opening in a dark chamber produced an inverted image on the wall of the chamber. So that between 1590 and 1666 Baptiste Porter and Sir Isaac Newton paved the way for the researches of Scheele upon the action of light upon this simple substance, as they called it, "luna cornea" or chloride of silver. Now Scheele, therefore, at his time, 1777, knew of the discovery of the prismatic colors, or the decomposition of white light by Sir Isaac Newton, and he made the experiment of submitting this horn silver or silver chloride to the action of light after the light had been passed through a prism and he found the light as we know it to consist of violet, indigo, blue, green, yellow, orange and red. Placing the silver chloride in this band of colors, he discovered the important fact that in the red rays the silver chloride received no change—that there was no change made in it. But, as he got along toward the other end of the spectrum, and got into the green and the blue and the indigo and the violet, he found that the color of the silver chloride changed much more rapidly, and he found that the most active in its effect upon the silver chloride were the blue and violet rays. In addition to this fact he found that the light discolored the silver chloride. Scheele still further proved that the silver chloride was decomposed by the light, and that chlorine gas, or, as he called it, dephlogistigated marine acid gas, was produced. He became acquainted with this previously from his experiments on the mineral braunstein with muriatic acid. So that when he perceived the odor of the chlorine from the decomposition of the silver chloride, he recognized the gas at once, and he says: "When this silver chloride turns black it gives out chlorine," and that was a very important fact. At the red end of the spectrum he found there was little or no effect upon the silver chloride. This was the principle of the camera obscura, and the principle of the camera obscura is the the principle of the photographic camera to-day. Practically the photographic camera consists of a dark box, with a hole at one end and at this end there is a place to receive an image. Instead of having a lens there in the front of the camera, as was formerly the practice, it is perfectly possible to get the picture with a small opening, say an eighth or sixteenth of an inch in diameter, and, furthermore, that is the most perfect picture you can get in a camera—a picture without a lens. Now, that is a strange statement, and perhaps in these days it may appear a little wild; but (exhibiting a photo about 5 x 7) there is a picture made with an opening not larger than a pinhole, and it is a good deal better than many of the pictures taken by the amateurs to-day. This opening being so small necessitates a good deal of time in the action of the light upon the sensitive silver salts behind, and that is the object of placing the lens there. By placing the lens here, instead of having a small opening, you make a larger opening which collects the light in the same manner, brings it to the focus and then the rays diverge again and you get the picture. Now, the rays as they pass through the opening without a lens, begin to diverge as soon as they are in the camera, but with a lens there they are brought together first and then cross and then you get the picture. That is the first step, then, in photography, the production of images by the camera obscura—and that is all the photographic camera consists of—a modification of it. Now, when the facts ascertained by Scheele, *i. e.*, the action of light upon silver chloride—turning it black and producing gas (and by the way Scheele never found out what this gas was and to-day it is a matter of controversy and a problem among chemists)—with the facts ascertained by Scheele, in regard to the action of light Thomas Wedgewood and Vueder made pictures, in 1802. These pictures were very peculiar. They spread upon paper and upon glass plates that had some gummy material upon them silver chloride—as a precipitate, and then they set their subjects up, so as to get a profile shadow with a strong light upon the surface. Now, where the light passed, of course they got a black mark upon the silver chloride, but the silhouette of the face was in white. Now, that was very remarkable, because they got some very remarkable pictures of which drawings were made. They were white silhouettes on a black background, but remember that the pictures that were thus made, the white silhouettes (if I may use the term) were made by the action of some light. If you wanted to copy them you had to copy them out of the light ; otherwise the whole mass would get black, and that was the difficulty. In other words, the white impression could only be examined by candle or some other weak light, and they ultimately became shrouded in darkness and were lost—so we have now none of those pictures.

While they were experimenting in England, a man named Niepse, a Frenchman, was at work upon the same subject—the action of light upon various materials, but in a somewhat different direction. In 1813, or probably before that time, he discovered that certain kinds of bitumen were soluble in oil of lavender, and that when you exposed these pieces of bitumen to some light the oil of lavender would not dissolve them any more. He conceived the idea (how, is not on record), but he thought that if he could coat plates with this bitumen and then expose them to light in a camera he could get a picture upon this bitumen, and where the light had acted the bitumen would be insoluble in oil of lavender. Where the light had not acted that he could dissolve it out. He proceeded to do this, and succeeded in getting pictures upon metal plates. He then, afterwards, etched the plates and thus got a perfect drawing or picture. So he used it simply as a means to produce a picture by etching. Now, understand, using the camera, he obtained an impression upon metal plates coated with bitumen. After exposing the plates in the camera he washed them in oil of lavender and then an etching fluid, and cut the impression into the matter and then they were printed. Some of these pictures are still in existence, they say. I have never seen any of them. After a time the plates were cleaned, and by the help of an etcher's tools or an engraver's tools they were cut still deeper and made very good engraving plates ; so that his object was not simply to etch them but to produce plates for engraving.

While this was going on Herschel made an important discovery in 1819, and that was that chloride and bromide and iodide of silver were not soluble when blackened by light. He found that after you had exposed these materials to the light—this silver iodide, bromide or chloride—and had washed all these with hypophosphite of sodium, they would not dissolve. That was important. That made it possible to preserve the silhouette pictures devised or discovered by Wedgewood and Vueder. Therefore, after exposing the plates in the camera, as did Niepse, the Frenchman, he washed them in a solution of hypophosphite of sodium. That took off the chloride of silver that was not acted upon by the light and he preserved the pictures. Some of the first pictures that he made were rather curious. I have not one of his original pictures ; I wish I had, but I have a picture made in the same manner. He took a piece of paper and saturated it with salt (he said that he used Bristol drying paper, which was a peculiar paper, made at that time in England). This was soaked in chloride of sodium or common salt, and then it was dipped and had flowed over it nitrate of silver Therefore he had in the pores of the paper chloride of silver in very intimate contact with the paper. Then he took such objects as ferns and pieces of paper, cut it in various shapes, and laid it on the paper. That produced such an effect as where the objects had laid they had the white impression. If you took this out in the sunlight it would all get black. But he made this important discovery and thus preserved the picture This was the first photograph made. We do that to-day, and produce other pictures with various other compounds, but I will speak of that later.

In the year 1824 we hear of another Frenchman (now, remember this was a long while ago, in 1819, and we had no photographs yet, although you might call that a photograph (exhibiting the fern picture) yet it is not. In the year 1824 we hear of another Frenchman who was a scene-painter at a theatre in Paris, and he had been using the camera obscura to obtain pictures from nature from which to paint his scenery. That is to say he had a tent built something like that (drawing figure on blackboard) with a lens something like that that was part of a right angled prism, and this light coming from the view, the image was formed in here and spread out upon a table from which he could make a drawing. He used that and was much annoyed at the time it took to get those pictures. He was very impatient, like a great many other Frenchmen. He conceived the idea of "fixing these pictures" as he called them. He did not want to have the trouble of drawing them. He said: "If I could only find some way of getting that fixed on the surface without the trouble of drawing it it would be a great convenience." This Frenchman was Louis Daguerre, really the father of photography. Now he worked independently for some time, when he met Niepse, the Niepse that had been working on bitumen and oil of lavender, and they formed a kind of partnership in 1829. Now, remember, 1819 was the time that Sir John Herschel had discovered hypophospite of sodium and its action on these silver compounds. They formed a partnership in order to work out "scene pictures" as they called them. In the year 1833 Niepse died—got tired of the work pretty much, I suppose—and Daguerre continued the work. What his early experiments were we have very doubtful records of. Daguerre did not seem to keep very good records. In the year 1839, little more than fifty years ago, he communicated to the French government a method for making pictures in the camera upon metallic plates. In other words he divulged the secret of the first photographic picture we have—the daguerreotype. This was such a great success and such a wonderful discovery that the French government pensioned Daguerre for his life time, and by an agreement with them the process became public property on August 10th, 1839. Now I have the good fortune to have here to-night the daguerreotype apparatus. This is practically all the paraphernalia of the daguerreotype. First of all was the camera (and you must pardon the condition of it as it is almost forty years old). I know of no other complete set in the United States, so this is rather a relic, and it requires a good deal of care in handling it for it almost falls to pieces. (showing the apparatus). Here is where the lens was put and in here is where the plate holder was put. They first had to fix the lenses in the ordinary way with ground glass. Then they had a plate-holder something like ours, that they put the metallic plate in. Now having fixed it, the next thing to do was to present to the sitter this metallic plate, and I have here one of just such plates. Now, into this plate-holder are fitted "kits" as we call them to hold different sized plates. Unfortunately part of this apparatus is lost; *i. e.*, to say all these little details of kits, but they could all be made out of little pieces of wood. Now, the daguerreotype is this: They take a silver-copper plate (a piece of copper plated with silver. When they first did this, they used to solder upon copper plates a piece of silver, then put it in a press and roll it out. After that time, in latter years when the galvanic battery had been discovered and was in common use, they electroplated it). Now, this particular plate was put into a holder that was held like that. Now the small boy was given one of the buffers or he was put at a wheel that had upon it a backing of felt and on the front of it was chamois leather (it is now long gone on this one—been rubbed off). This plate was then rubbed with a great deal of dexterity and you had to be very careful that you did not scratch it. That was the most important thing about them. It spoilt the picture if you scratched them. They had to be perfectly smooth. As I said, this was sometimes done by holding the plate on a wheel, but the ordinary way was by using one of these buffers. The silver plate was taken out by undoing this screw at the corner. Now, the first thing to do with it, then, is to make it sensitive. It is merely a silver surface now. It was made sensitive by placing it in one of these boxes (showing it) called coating boxes. Now that plate was put into that box (showing the same box), and see there is the lime in the box and it is now probably forty years old, having never been disturbed. In that lime was placed bromine, and it was then covered with a glass cover that fits over this glass trough or dish—it is rather deep. This was then placed with a little pressure—in order to keep the box tight and not let the bromine fumes get all over the studio—and they put the plate in here and pulled this over, so, leaving it there a certain number of minutes, and by action of the bromine vapor it becomes coated with bromide of silver. Then they either put some iodine into this same box or they had an iodine box. After the plate was in there a few minutes, they took it out and put it in there and gave it a dose of bromine. It was found, and by whom I am not sure, that the addition of a little iodine or a small proportion of iodide of silver with iodine of silver gave better effects. So it was then taken out and it was sensitive to light. Now, Daguerre discovered all that. This was then put in the plate holder and exposed in the camera and he got a picture. And it bothered him a great deal, for it faded. If he put that hypophosphite of sodium on it that our friend Herschel discovered, it cleaned the whole picture off. There was not enough of it. So he watched and watched and was weary with making these pictures and having them fade, until he went one day to a closet where he had a lot of these pictures stored, and he was delighted to see that the picture of a certain monument (I think it was) that he had made he thought on that plate some time before, and it was a good picture and a permanent picture. How it came about puzzled him a great deal. In looking around the closet where these pictures were exposed —where these plates were stored—he found that for some reason or other the bottle of mercury had been broken, and he tried almost every imaginable material in the closet, and at last it struck him it might be mercury. Well, he put some mercury on the plate and he ruined it. "Well, no," he says, "it is not mercury but mercury in a very fine state. I wonder if it is the *Vapor of Mercury*?" He tried it and found that it was. That led to the development of the daguerreotype. Then all he did with a plate was to put it into a vessel with a few drops of mercury, and underneath a little spirit lamp. Then he would put the plate in and watch the heat (some now have a thermometer) and he would just pick it up every once in a while to see how it is developing. That process gave to him the first picture, the daguerreotype, and those are to-day the handsomest pictures ever made by photography. I have two or three of them which are partly spoiled, but to-day they far surpass anything we have ever since done in the science of photography. After the mercury process, it was very easy to wash the plate off. The object of the development was this: that where the light had acted there the mercury seemed to take hold and bring out the picture. Where the light had not acted you could dissolve the silver surface off with cyanide of potassium, which was generally used. But, if you will look at this old-fashioned daguerreotype, you will see that you had to look at them in a certain light; otherwise, you could see nothing.

Sometime afterwards a man named Fitsherbert, a Frenchman, conceived the idea of changing this peculiar picture in silver plate into a gold picture. In other words, he put into the plate a little chloride of gold and produced a daguerreotype which can be seen pretty clearly by looking squarely at it.

The beginning of the daguerreotype flourished only a short time. While Daguerre and others were working at the daguerreotype, Fox Talbert, a rich Englishman, took up the subject from another point of view. He conceived the idea of making a negative. Of course, every picture you took by Daguerre's method you had to make a sitting for it. Such are the pictures up in the School of Mines of William Lloyd Garrison and Daniel Webster. They had to sit right down in front of the box, and copies could not be had. That was the trouble with the daguerreotype. You had one picture for every sitting. To make the difference between the positive and negative more clear, I have brought here to show you to-night (producing them) some positives and negatives printed on the same piece of paper. When the picture comes out of the camera and the plate is developing (exhibiting it) that is what it looks like—where the light struck all the light parts of the picture are black, and where the light did not strike all the black parts of the picture are white. If I take the same surface, containing the bromide of silver, iodide of silver or chloride of silver, and place it underneath that and expose it to the sunlight, where the light strikes through it will produce black, just as in the original object, and when I get through I get the positive. So there is a negative and there is a positive from the same picture. Now, that was Fox Talbot's idea. He says "If I can do that, I can make pictures *ad libitum*." With this object in view he coated paper with silver chloride. He exposed it then in the camera, fixed it in a solution of salt—common salt or iodide of potassium—and when he got through the picture was a permanent one, because the iodide of potassium dissolved out the white parts that were not affected by the light. From this negative he obtained other prints.

Now, various modifications of Fox Talbert's process, were brought out, and a man named LaGray. I think (or at least it was just about the time he lived) conceived the idea of making these pictures more transparent by waxing them. That was the first good negative we had. It was a modification of Fox Talbert's idea, only he waxed the paper. Then about the same time it was found that a mixture of chloride of iron and cyanide of potassium, when mixed together were acted upon by light. Herschel discovered this, and that was the way we obtained the blue print, which is far older than the photograph. Sir John Herschel found that a mixture of chloride of iron and cyanide of potassium, when exposed to sunlight made Prussian blue. So that if you take paper and coat it with this mixture and then expose it under a negative you get a blue picture.

The trouble with these paper pictures was that you could not eliminate the grain of the paper, and if you will examine these close enough you will see that they are blurred. This one printed from that particular negative is blurred —very much blurred. These sensitive silver compounds are so sensitive that the grain of the paper produces an impression. Now, in 1848, Niepse, a nephew of the first Niepse, thought it would be a good idea to use glass plates coated with albumen. He took chloride or iodide of silver, mixed it with white of egg, spread it on plates, heated the plates, which, of course, coagulated the albumen, and that fixed his film upon the glass plates. That was quite a step. Now, we had gotten rid of the paper. By the way, I made a little mistake there about the way he got the picture. He got the picture by putting salt in the albumen and then coagulating it, and then he dipped the plate into a solution of silver nitrate and in that way got the precipitate in the film itself. This was important but troublesome and not always successful.

Now, a few years before another discovery was made. Remember that this was in 1848 that Niepse worked with the albumen process. In 1840, Schurben, a Swiss chemist, discovered gum cotton. This gum cotton is a nitrated compound of cotton, made by the action of concentrated sulphuric and nitric acids upon cotton. Sometime afterwards Maynard, a Yankee, in Boston, discovered that this gum cotton was soluble in alcohol, and ether, and then he found that by evaporating the substance he got the thin film o collodion. Scott Archer, an Englishman, conceived the idea of using this film as a vehicle for these particularly sensitive silver salts for photographing. His method was pretty much that which is followed to-day and that is still in use to quite a large extent.

In this process we have this series of operations: First, the plate must be perfectly clean. That is essential. Any little spot upon it will form a nucleus which will spread over the surface of the plate. The plate is then coated with albumen and allowed to dry without heating. It is then flowed with this collodion, and in the collodion is put the chloride, iodide or bromide of silver, which you need. It is generally the chloride, iodide or bromide of silver. This collodion is afterwards dipped into a silver bath, and then we get the sensitized silver surface, very thin and perfectly transparent. It is then ready to go into the camera. It is put into the camera soaking wet with nitrate of silver. It is exposed and then developed with a solution of sulphate of iron with some acetic acid. After it is developed, the developer is washed off, fixed with hypophosphite of sodium, dried, varnished and we get the negative.

Now, the curious part about this wet plate process is that it is slow. The compounds are not very sensitive compared with the modern compounds. In the second place it is essential to use it wet. If you took the plate out of the silver bath where you sensitized it and washed off the nitrate of silver adhering to it and put the plate in the camera you would not get a picture. The silver nitrate is essential to the production of the picture. It acts in this way : Where the light has acted upon the sensitive silver compounds and you proceed to develope the picture, when you mix the sulphate of iron and pour the developer upon the plate, as the iron comes in contact with the nitrate of silver, with which the plate is wet, it produces metallic silver, which adheres to those parts of the picture which have been acted upon by the light. That seems to be the philosophy, because if you wash the nitrate off you cannot develop a picture upon such a plate.

Now, this process of photography revolutionized the daguerreotype, revolutionized photography and the daguerreotype became obsolete. I think it displaced the daguerreotype in three years. This procees was such an advantage—collodion was such a nice substance to work with—that it revolutionized the photography of those days, and the daguerreotype fell out of existence.

Now, when you take into consideration the time that people had to sit for their pictures—five or six minutes—you can conceive how hard it was to keep still. They had such queer contrivances to keep the head straight, they screwed you up in various positions, and this was particularly exasperating where they had to take pictures requiring a good deal of time. Dr. Draper, who took some of these daguerreotypes, and who I believe was the first photographer of these pictures, desired to take a photo of his estimable lady. His studio was in the old University Building in Washington Square. I believe Mrs. Draper had to sit twenty minutes for that picture. In order to produce the best effect he had a tank made in the top of the laboratory so as to produce a blue light. Mrs. Draper was very patient while he was at work with this, and unfortunately, Dr. Colton tells me, the result was two pictures on the same plate. I should think it would. That was the first effort ever made to take the human face with the daguerreotype. Of course, with all that paraphernalia, with that slowness of action, anything that worked within a minute was considered wonderful, and that was practically what happened when Scott Archer discovered collodion.

This wet plate process continued from 1851 to 1871, about twenty years. I have the pleasure of showing you an amateur outfit for this process, used in 1860 to take to the Rocky Mountains (exhibiting it). That is an amateur outfit carried over the Rocky Mountains in 1860 to take pictures. Here is the old tank that carried the water. Here are some of the bottles of chemicals, and the way it was managed was this : This was hooked up, on the end of these sticks. This was the black cloth used as the developing room by the operator. Here is a little window with yellow glass to develop the pictures. The plates and bromide of silver was carried in these two boxes. That was carried on top of the mule and the boxes on the sides of the mule, so that he had a pretty good mule.

Now, to-day we do the same work with that apparatus (exhibiting apparently a Kodak), and a great deal better work it is.

In 1871 a more important revolution took place even than the wet plate process or the daguerreotype. Many efforts had been made to overcome the use of the wet plate—the plate wet with nitrate of silver, and some of the efforts were very successful but usually troublesome. The plate was kept moist in a variety of ways: by honey, by tea, by infusion of tea, by beer, by coffee, and a multitude of all the funniest concoctions you could think of, but the process was destined to fail.

In about 1870 it was conceived that you could make an emulsion of these peculiar compounds of silver—these sensitive silver compounds—that you could make an emulsion that you could pour upon the plate and produce a picture just when you pleased, and it was found that by mixing the chloride that produces the sensitive material in one portion of your collodion and putting nitrate of silver into another portion of the collodion, in certain proportions, you could produce a collodial emulsion. They had to be mixed in just exactly the right proportions, so as not to have an excess of nitrate of silver or an excess of bromide.

But that process failed and only lasted a few years; although I have here one of the plate holders used by such a process.

This was between the time of the wet plate process and the modern dry plate, when they used collodial bromide emulsion. It was a kind of a compromise between the wet plate and the dry plate. In 1871, Dr. R. L. Maddox, of Bath, England, had the idea that he would use gelatine, instead of albumen or collodion, as a vehicle to hold these silver salts upon the glass surface, and he found, among other things, something that surprised him—that when he put the silver salts in to contact with this gelatine they became wonderfully more sensitive than ever before.

The idea is this: That you make a gelatine mixture of a certain strength—the proportions required a certain amount of soft gelatine and a certain amount of hard gelatine. Into that gelatine you pour, with constant stirring; you pour a mixture at the same time—some particular bromide, generally bromide of potassium and nitrate of silver—in a very thin stream and keep it thoroughly stirred up. If you go too fast, you will not get the right result; but the result is, when you get through and do it right, you get a beautiful milky fluid, and that fluid contains bromide of silver in a wonderful state of suspension—very thin—and it remains suspended in this fluid. Now let that set—this cream or "emulsion," as they call it—and you have as a result iodide of silver and iodide of potassium. You let the emulsion set and it produces a jelly, that jelly is then cut up into shreds, rubbed through a sieve or something of that kind to make it thoroughly divided, and washed thoroughly with water. Having done that it can be melted, and if you melt it and heat it to a certain temperature, there does not seem to be any limit to the sensitiveness of the material. If you use it cold it requires a second or two to produce a picture. If you cook it, however, you will find that it will become more and more sensitive to light, until it is actually possible to take a picture of a projectile traveling four hundred metres per second. I have such a picture. The only trouble is that some of the plates made are so sensitive to light that we cannot get a light non-active enough to develop them. Having these bromide plates then in the camera—this sensitive material coated on these glass plates in the camera—you have got to be very careful that the light does not get to them. The consequence is that the plate holders are made with extreme care.

The result of this gelatine-bromide of silver process is this: that we can have plates in packages. We can put these emulsion plates and carry them off where we please, and, what is still more important we can put the emulsion upon very thin material, and I have here (exhibiting them)thin sheets of celluloid upon which this emulsion has been spread and pictures taken. That is not all, either; they can make it still thinner (producing small camera) they can put it on a roll and in this camera is one of those rolls, and in that box I can take a hundred pictures without reloading the instrument. The way it is done, I, when I want to produce a new surface, simply wind the old one off with this winding machine. There is an opening at the front of the camera. Press just below this, so, and you have the picture. Now just wind the film off and you are ready for the next picture. Now pull it again, and this is so easy that some manufacturers say: "You simply push the button and we do the rest for you." That is nonsense, they don't do the "rest" for you. A friend of mine took one of these to Europe, and with it a dozen rolls of film, all of which he used. When he returned he sent them to the manufacturers and I think he got about twelve pictures back. Not every time you press the button is a good picture produced. You have to know a little bit about the science and use a little judgment.

Such is the state of photography today that this material can be spread upon any kind of transparent surface. In the case of plate, they are put in holders like this, generally only two on each side, and slipped into this frame in a dark room, in which no light can be used except one emitted through a deep red chimney. (The professor here exhibited such a chimney.) Then, the material that is used for developing these pictures is somewhat different from the old method. We use organic compounds, alkaline solutions, and organic matters capable of taking up oxygen. These organic materials, in conjunction with some alkali, are capable of taking up oxygen. They produce a disozygenizing action. After dipping, that gives you the negative.

The prints are made in a variety of ways. The facility with which these apparati can be used has led to an enormous variety. You can have an apparatus something like that, or something like this, which is smaller.

In the United States there are to-day probably about ten thousand professional photographers and thirty or forty thousand amateurs, who usually do nothing but spoil plates. To give you an idea of some of the work done, not altogether by professionals, I have picked out from the number of pictures I have a few samples of the work. Here is a picture of a cattle ranch in Colorado. I have one a little larger of a horse race, but this is about as large as they can be made. That will give you an idea of the instantaneous effect. The distance between the foot and the top of the mountains is about twelve miles, so that you can get an idea of the capacity of the camera, of the sensitiveness of these compounds. Here is a Mexican picture which shows the great beauties of the Mexican flora — the cacti. Here is a study "King Lear" made by Buffler, the photographer. That is about as large as you can get. It is a pretty large plate to handle. Then there is another study "The Five O'clock Tea" some ladies at tea, by the same man as "King

Lear." Here is another study, "A Game of Sixty-six." Those are all silver prints, made with chloride of silver, using glass negatives and producing the positives by having the chloride of silver in albumen. The best vehicle to-day for making positive prints is albumen with chloride of silver.

It is found that if you take a mixture of gelatine and bichromate of potassium, and put into the mixture some pigment and expose it under a negative where the light acts, the gelatine is made insoluble and holds the pigment, and where the light does not act the gelatine is still soluble and can be washed away. Here is such a picture and it is very interesting—"In Camp." The shadows in that picture are on the white paper underneath.

Here are a couple of pictures of silver, two Bavarian pictures. This one, of a little girl, is by Einlander of Cologne, instantaneously taken without a head-rest, which is a very difficult piece of work. This is the same idea, instantaneously taken. Here are two pictures very interesting, which were in the exhibition at Chicago. They are pictures in platinum, showing that we are not confined to simply silver salts. We have here in this last picture one of the chlorides of platinum, the platine chloride. It cannot be spoiled in any way. The picture is good as long as the paper is good.

Here is an example of a yacht picture. It is the English yacht Iris. It is a fine picture. The yacht is travelling very fast

Here is a picture on the East River, made by Dr. Habershaw, showing the work of amateurs in this line.

I could tell you a good deal more about this subject, but there is only one other thing I would now like to mention. Some of you, I suppose, have heard a great deal about taking photographs in colors. We are very near it. They have produced in France, Germany and England pictures of the spectrum in the silver salts: that is to say, with the colors of the spectrum. They are very weak and have to be looked at in a certain light. They are the result of interference of the thin films. We are doing something more important. We are learning to make the whole spectrum. For example, we can to-day get just as good an impression upon silver salts with a red light as Scheele did with a violete light in 1774. That leads to what is called ortho-chromatic photography, that is photography that will give us every color in the spectrum. It has been found possible to make pictures in certain colors. A long time ago, the spectrum was separated into three colors, red, yellow and blue of certain kinds.

Now, if you take a picture in a red light of a certain character, and another of the same subject in a yellow light of a certain character, and another in a blue light of a certain character, you have three negatives. You can make three negatives, one of the red light, one of the yellow light and one of the blue light. Now, by taking pigments and printing in a press like a lithographic press, you can make a red positive from the red negative, and a blue positive from the blue negative and a yellow positive from the yellow negative, and in that way you may get three impressions, which is the result in the same colors. You must not stop there, however. There is a certain amount of shadow, and the result of it is that they have to what they call "over-lay," taking the three colors separately and superimposing them in printing. Remember, the red parts of the picture are taken with the red light. That is, suppose you put a red piece of glass in front of your camera, then only the red parts of the picture pass through to the sensitive plate. Then repeat the operation with the blue glass and the yellow glass, and the result will be as above.

Now I hope I have not bored you by any profuse details. I did not intend to. I only tried to interest you in one of the most important inventions of the Nineteenth Century. The steam engine, the telegraph, the telephone and the photograph are four of the grand inventions which the century has produced, and I think every intelligent person should learn something about them. I am afraid that I have had too little time to do the subject justice. You can understand how much more there is behind this superficial view. I only have to thank you for your very kind attention.

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THE ABILITY OF CONSTRUCTION.

AT this stage of the world's history men of ability and even of genius in a certain sense are not rare. The result is that in all of our institutions of learning the requirements become more stringent and by the time graduation arrives we see the survival of only the very best men. We find the same classes of men throughout life that we find in college—we find men of energy and slothfulness, men devoted to pleasures and by nature politicians, men of ability of construction and men of power in criticism. While at College the training to-day is chiefly analytical and the result is that men are prone to examine everything closely and some even learn to take delight in tearing things to pieces. There are some men who are utterly ruined so far as their inward happiness and that of those about them is concerned by their critical tendencies. They do this to the detriment of their own energies and abilities of construction and hence never or but seldom build anything, but employ their days in tearing down what others have built. The critic is necessary and essential in every department of labor where human thought is allowed entrance. Criticisms that are honest always help the builder and are a gain to posterity.

It is questionable if it is desirable for the conscientious young man to encourage in his life a too critical tendency. It is not necessary to look at the bright side of the affairs of life, or even to look upon men charitably, so to speak. It is sufficient for every young man especially to look upon events of life as they are. It is decidedly important for the man of aspiration to look upon life with its duties when he has had sufficient rest and food and exercise. Wrongs may be righted and errors corrected in but two ways: the thoughtful way and the thoughtless way. The thoughtful way is always attendant of health and with a broad minded and large hearted individual. It is not our desire, however, to dwell too long upon the subject in the abstract as we are anxious to reprint the closing words of Senator Henry Cabot Lodge's Phi Beta Kappa oration delivered last June at Harvard College. He said in closing:

"How then is a university to reach the

results we ought to have from its teachings in this country and this period? Some persons may reply that it can be obtained by making the university training more practical. Much has been said on the point first and last, but the theory, which is vague at best, seems to me to have no bearing here. It is not a practical education which we seek in this regard, but a liberal education. Our search now and here is not for an education which shall enable a man to earn his living with the least possible delay; but for a training which shall develop character and mind along certain lines.

"To all her students alike it is Harvard's duty to give that which will send them out from her gates able to understand and to sympathize with the life of the time. This cannot be done by rules or systems or text-books. It can come from the subtile, impalpable, and yet powerful influences which the spirit and atmosphere of the great university can exert upon those within its care. It is not easy to define or classify these influences although we all know their general effect. Nevertheless, it is, I think, possible to get at something sufficiently definite to indicate what is lacking and where the peril lies. It all turns on the spirit which inspires the entire collegiate body, on the mental attitude of the university as a whole. This brings us at once to the danger which I think confronts all our large universities to-day, and which I am sure confronts that university which I know and love best. We are given over too much to the critical spirit and we are educating men to become critics of other men instead of doers of deeds themselves.

"This is all wrong. Criticism is healthful, necessary, and desirable, but it is always abundant and infinitely less important than performance. There is not the slightest risk that the supply of critics will run out, for there are always enough middle-aged failures to keep the ranks full if every other resource should fail. Faith and hope, and belief, enthusiasm, and courage are the qualities to be trained and developed in young men by a liberal education. *Youth is the time for action, not criticism.* A liberal education should encourage the spirit of action, not deaden it. We want the men whom we send out from our universities to count in the battle of life and in the history of their time, and to count more and not less because of their liberal education. They will not count at all, be well assured, if they come out trained only to look coldly and critically on all that is being done in the world and on all who are doing it. We cannot afford to have that type, and it is the true product of that critical spirit which says to its scholars: "See how badly the world is governed; see how covered with dust and sweat the men who are trying to do the world's business, and how many mistakes they make; let us sit here in the shade with Amaryllis and add up the errors of these bruised grimy fellows and point out what they ought to do, while we make no mistakes ourselves by sticking to the safe rule of attempting nothing." This is a very comfortable attitude, but it is one of all others which a university should discourage instead of inculcating. Moreover, with such an attitude of mind towards the world of thought and action is always allied a cultivated indifference than which there is nothing more enervating. * * *

"The time in which we live is full of questions of the deepest moment. There has been during the century just ending the greatest material development ever seen. The condition of the average man has been raised higher than before, and wealth has been piled up beyond the wildest fancy of romance. We have built up a vast social and industrial system, and have carried civilization to the highest point it has ever touched. That system and that civilization are on trial. Grave doubts and perils beset them. Everywhere to-day there is an ominous spirit of unrest. Everywhere is a feeling that all is not well, when health abounds, and none the less dire poverty ranges by its side, when the land is not fully populated and yet the number of unemployed reaches to the millions. I believe we can deal with these doubts and rents successfully, if we will but set ourselves to the great task as we have to the trials and dangers of the past. But the solution will tax to the utmost all the wisdom and courage and learning that the country can provide. What are our universities, with their liberal education to play in the history that is now making and is still to be written? They are the crown and glory of our civilization, but they can readily be set aside if they fall out of sympathy with the vast movements about them. I do not say whether they should seek to resist or to sustain or to guide and control these movements. But if they would not dry up and wither they must at least understand them.

"A great university must be in touch with the world about it, with its hopes, its passions, its troubles, and its strivings. If it is not it must be content.

'For aye to be in the shady cloister mewed,
Chanting faint hymns to the cold, fruitless moon.'

"The university which pretends to give a liberal education must understand the movements about it, see whether the great forces are tending, and justify its existence by breeding men who by its teachings are more able to render the service which humanity is ever seeking."

Professor Fried. Aug. Flückiger died on Dec. 11, 1894, at Berne. He was the foremost pharmacognosist and scientific pharmacist of his time. An extended account of his life and works will appear in a later issue of THE ALUMNI JOURNAL.

NEW LITERATURE.*

Bacteriology.

Mikrophotographischer Atlas der Bakterienkunde.—C. Fraenkel u. R. Pfeiffer. 2 Aufl. 11, u. 12. Lfg. Berlin: August Hirschwald.

Mikrophotographischer Atlas der Bakterienkunde.—Itzgerott u. Niemann, Leipzig: J. A. Barth.

Botany.

Beitrag zur Kenntniss der Bestandtheile von Cnicus benedictus mit hauptsächliche Berücksichtigung des darin enthaltenen bitter schmeckenden Korpers.—Karl Schwander. Inaug.—Diss. Univ. Erglangen.

An examination of the constituents and particularly the better principle of Cnicus benedictus.

Beitrag zur Kenntniss des Bitterstoffes von Citrullus colocynthis.—Rud. Speidel. Inaug,—Dissert. Univ. Erlangen.

Weitere Beiträge zur Cheimischen Kenntniss einiger Bestandtheile aus Secale cornutum.—Hans Zeeh. Inaug.—Diss. Univ. Erlangen.

Uebersicht der Leistungen auf dem Gebiete der Botanik in Russland während des Jahres, 1892.—Zusammengestellt von A. Famintzin u. S. Korshinsky unter Mitwirkung von Anderer. Aus dem Russ. ubers. von F. Th. Köppen. Leipzig: Voss. A review of the history and events in botanical works in Russia during 1892.

Atlas der officinellen Pflanzen.—A. Meyer u. K. Schumann. 1892-1894. Leipzig: A. Felix. Darstellung und Beschreibung der in Arzneibuche für das Deutsche Reich erwähnten Gewächse. Zweite verbesserte Auflage von "Darstellung und Beschreibung sämmtlicher in der Pharmacopœia Borussica aufgefuhrten officinellen Gewächse von O. C. Berg u. C. F. Schmidt."

Chemistry.

A Text-Book of Organic Chemistry.—A. Bernthsen. Translated by G. M'Gowan. 2d Eng. Ed. Revised and Extended by the Author and Translator. London: Blackie.

Chemie médicale.—Corps minéreaux. Corps organiques. L. Garnier. Paris: Rueff et ciè.

Nozioni di Fisicia. Chimica e Mineràlogia ad Uso delle Scuole techniche e delle Preparatorie alle Normal.—M. Borzone. Torino.

* Readers desiring any of the works contained in this list can obtain them through B. Westerman & Co., 812 Broadway, Gustav E. Stechert, 810 Broadway, or other foreign booksellers.

Grundzüge der mathematischen Chemie.—Georg Helm. Leipzig: Wm. Engelmann. The author discusses the transformation of energy by reason of chemical action.

Kurzes Repetitorium der Chemie.—I. Theil Anorganische Chemie. 2. Aufl. Ernst Bryk. Wien: M. Breitenstein,

Grundzüge der Chemie und Mineralogie für den Unterricht an Mittelschulen.—M. Zaengerle. 3. Aufl. Munchen: J. Lindauer.

Hygiene.

Text Book of Hygiene.—G. H. Rohe. Philadelphia: F. A. Davis Co.

A comprehensive treatise on the principles and practice of preventive medicine from an American standpoint.

Materia Medica.

Organic Materia Medica and Pharmacognosy. Illustrated. By Prof. L. E. Sayre: P. Blakiston & Co., Philadelphia.

In these days of degenerate rivalry among educational institutions, and particularly among the different classes of technical schools, when their officers are wont to prefer the very poorest of text-books, written by one of their own number, for the best of them should it emanate from a rival institution, we have become accustomed to looking upon publications of this sort as serving merely, like an electoral vote, to count one among the general collection. It can scarcely be expected that text-books written from such standpoints and with such motives can have much permanent value, and the future educational historian will doubtless look with amazement upon the of trash of this character which has been brought to light during the present era. In the midst of this wearisome train of events it is refreshing to have presented to us a new text-book, whose publication constitutes, as to its main part, a real event in the history of pharmaceutical education.

Prof. Sayre's work on Pharmacognosy has a real reason for existence in its scope, arrangement and execution. It is new and original, and will stand by itself as a prominent American text-book. If it possesses glaring and in some respects fatal defects, it at the same time presents the merit of ingenuity in construction as well as in the selection of subject matter, and it cannot fail to become a much-used reference book, not only by the pharmaceutical profession for whom it is intended but by physicians as well. It is perhaps unfortunate that so many individuals, and nearly all of them students, should have been given a free hand in the working out of the various departments, and that their products have not been in all cases perfectly harmonized by the master. It is also unfortunate that so many statements should have been taken, without investigation, from other authors. A brief scrutiny of the pages will suffice to reveal this composite origin, even if one does not read the acknowledgments of the author in his preface. Doubtless Prof. Sayre, while he has not greatly interfered with the individuality of presentation of these different subjects, has taken pains to verify the accuracy of the facts and conclusions recorded. Should such prove upon closer investigation to be the case, the defect referred to must doubtless be considered as one of style merely.

The appearance of an American work on Pharmacognosy is of so much importance that it is not inappropriate that it be analyzed with some degree of fulness. The book consists of two parts with three appendices. Part 1 is on "Pharmacal Botany," while part 2 is upon "Organic Materia Medica and Pharmacognosy." It is impossible to review this work fairly in the interest of the public as well as of the author without recording the opinion that the eighty-two pages comprising Part 1 should never have been published, if we regard either the reputation of the author or the welfare of students of pharmacy.

Our American text-books on Pharmaceutical Botany, (not "Pharmacal Botany,"as the author unhappily calls it, which would mean the Botany of the Pharmacy, or of the place in which pharmaceutics are practiced,) bears no evidence that any author has yet comprehended the needs of pharmaceutical students in this direction, or has adjusted his instruction so as to accomplish the object for which it was devised. The idea invariably indicated by the writings, even if not intended by the writers, is that as the application of botanical knowledge to the practice of the pharmacy is limited, its teachings may therefore be superficial, indefinite and vague. The true idea it seems to us is, that it should be curtailed and limited only as to the portions of the field covered; but these requisite portions should be taught with a fulness of illustration, a clearness of presentation and a simplicity of style, all the more marked because the student is deprived of the enlightening effect contributed in other cases by those portions which are here necessarily omitted.

As a synopsis, or summary of knowledge, intended to guide the teacher instructed in the subject, these eighty-two pages will answer fairly well; but to enable a student who is proceeding *de novo* to gain a knowledge of structural botany for the purposes of pharmacognosy, we can see nothing but failure. Herein we criticise the book, not specifically the author. Publishers' books are not always authors' books. It is doubtful if any publisher can be found willing to publish as a business enterprise, a perfect text-book of Botany for pharmaceutical students.

When such appears, it will be as a labor of love, by one whose regard for the subject is such as to lead him to donate his time and labor, and whose means enable him to bear the burden of a financially unsuccessful enterprise.

The part of the work under criticism is a mere series of definitions, illustrated in a highly unsuccessful manner, and frequently losing sight of the requirement that a definition must include the whole of the thing defined and nothing else, It is very naive to say: "All organic matter containing a green coloring matter called chlorophyl, belongs to the vegetable kingdom," without directly stating that no other class does, which statement would leave out the fungi, a part of the definition of which is that they contain no such matter. To define Morphology as treating—"Of the organs of plants and their relations to each other," is not to define it at all, as that would include the whole of Organography, and does not even exclude Physiology, except by virtue of the author's preceding clause. Systematic botany, defined as "That division which treats of the arrangement and classification of plants," does not suggest the vital characteristics of that subject. It would be more philosophical to refer to the distinctive characteristics of Phanerogams as the manner in which the embryo is produced within a true seed,than to intimate that the embryo is entirely foreign to cryptogamic reproduction. These definitions, taken from less than two pages of matter, indicate to our mind a lack of the expenditure of time requisite to bring forth a set of new definitions more perfectly in accord with the fullest knowledge of to-day than any list which has yet appeared; and yet when the instruction given in a new text-book is chiefly limited to definitions, that is the very least that should have been attempted.

Some of the morphological definitions are actually at variance with accurate descriptive usage, as that of primary and secondary roots, duration, etc. To call a stem an "axis" and a root an "axis" of a different kind, is to perpetuate a term at the expense of all regard for that accuracy which is the most important element of scientific language. Such subjects as venation are of prime importance to the pharmacist, and so far from restricting the teachings to several of the more important terms presented in ordinary text-books on botany, the classification should be elaborated in its fullest details. Compare the definition of classes, as "Plants resembling one another in some grand leading feature," and of orders or families, as "Plants that very closely resemble each other in some leading particular," with the clear presentation of ranks in class characteristics, given by Agassiz a generation ago, and which should, if anything, have been improved upon in the light of modern knowledge and perfected usage.

The subject of nomenclature, the recent agitation of which has done more to expose and shatter erroneous practices in scientific thought and custom than any other influence, and whose correct apprehension is the very corner-stone of pharmacopœial definition, we do not see anywhere treated.

It is a pleasure to turn from a contemplation so depressing to the spirits of one who has labored hopefully for years to secure a just and rational treatment of his favorite study at the hands of Pharmaceutical educators, to Part II. of Prof. Sayre's book, a work so bright and practical, so replete with new and helpful ideas in the teaching of practical Pharmacognosy, and so full of information, both standard and exceptional, though unhappily marred by many errors, as to secure for it at once a prominent place upon the shelves of the "Handy Book Case."

The principle is here adhered to of making a single volume do duty as a text-book of Pharmacognosy and of "Materia Medica," as the latter term is commonly used. We have never looked upon this method as being practicable, but Prof. Sayre resorts to a most ingenious device never before resorted to, by which it must be admitted that better results have been obtained than have previously been reached. What might be called a "Pharmacognostical Key," or a synopsis of Pharmacognosy, is presented separately in advance of the main body of Part II. Here the drugs are numbered to correspond with the consecutive numbering prominently displayed under the second arrangement, that by natural orders, the proper method for retaining and displaying the natural relationships of active constituents and medicinal properties. The "Pharmacognostical Key" appears to us a failure in its practical workings, owing to indefinite characterization, by reference to taste only of the headings. If a drug is both bitter and aromatic, we have to look for it both in Class I. and Class III. A bifurcating key is here required, or better, we might take a combination of characters for each heading. On the whole, this key, while elaborate and very full, aud subject to great improvement by a few trifling changes, we must regard as inferior to that of Maisch's text-book. Prof. Sayre very sensibly omits all attempt to classify volatile oils, except by indicating their sources.

The arrangement of the matter of the second part is, first, a brief description of the ordinal characters, followed by a list of the drugs belonging to that order, those official in heavy-faced capitals; then the drugs are taken up separately, the official names and synonyms in the important languages presented, the definition, botanical characteristics, sources, related, and similar articles, description of drugs, with the more important characters printed in heavier type, accompanied generally by a picture of the plant and of the drug, gross and structural, important constituents, actious and uses, and a syuopsis of the official preparations. The doses of the drugs are given, but not of the preparations, though the strengths of the latter are stated. An unfortunate feature, as in Part I., is the illustrations. They are not at all uniform in effect. While the method followed has given exceptionally good results in some cases, yet in many others they are very unsatisfactory, and this is more particularly true from a scientific than from an artistic point of view.

Valuable a contribution as is Part II., there is an evident unfamiliarity with, or disregard of, the commercial aspects of drugs. For instance, the important distinctions between Cassia vera and C. lignea, and the subject of Batavian Cassia, a correct understanding of which is a great aid in the economy of the drug store, are entirely omitted. The distinctions between Coto and Paracoto are not clear, and in the facts concerning commercial occurrence are reversed. Mace is not, as described, a "membrane," neither does it "invest the kernel." Moreover, nothing is said about Wild Mace, now so extensively used as an adulterant that it is possible that it constitutes the larger part of commercial Mace. "Reddish brown" boldo leaves are old and worthless. The description of Piper longum is only partly true, according to the variety under consideration, and the individual parts are not "berries." The part rubbed off from Piper album is not correctly described as an "epidermis." The important characteristics distinguishing true from false cubebs is not given.

Appendix "A" is a valuable contribution on the subject of insects injurious to drugs.

Appendix "B" is no less important, it being an account of the contributions of organic chemistry to materia medica.

Appendix "C" treats of "Pharmacal Microscopy" in such a fragmentary and superficial way that it will scarcely be found of service to any one in these days.

H. H. RUSBY.

Pharmacy.

Einführung in die Maassanalyse.—M. Vogtherr. Für junge Pharmaceuten zum Unterricht und zum Selbststudium. Unter Berücksichtigung des Arzneibuches für das deutsche Reich und der Ergänzung desselben durch die ständige Commission für die Bearbeitung dieses Arzneibuches. 2. Aufl. Newied: Heuser's Verlag.

Pharmaceutisk Haandboog for 1895.—E. P. F. Peterson. Kjobenhaven: F Host & Sons.

Photo-Micrography,

See also Bacteriology.

Photo-Micrography—H. van Heurick. Eng. Ed. Re-edited and augmented by the author from the 4th French edition and translated by Wynne E. Baxter. With Illus. London: Crosby, Lockwood & Son.

Photography.

Deutsches Photographen Katender. — K. Schwier. Taschenbuch und Almanach für 1895. 14. Jahr Weimar.

Physics.

Manual of Physico—Chemical Measurements—W. Ostwald. Translated by James Walker. London and New York: Macmillan.

A Laboratory Manual of Physics and Applied Electricty.—E. L. Nichols. 2 vols. London and New York: Macmillan.

Anfangsgründe der Physik mit Einschluss der chemie und Mathematischen Geographie.—K. Koppe. 20. Aufl. Ausgabe B in 2 Lehrgängen. Für höhere Lehranstalten nach den preuss. Lehrplänen von 1892. Bearbeitet von A. Husmann. II. Th.: Hauptlehrgang. Essen: G. D. Baedeker.

Elementi di Fisica ad Uso delle Scuole secondarie.—F. Cintolesi. Livorno.

Thermo Dynamics treated with Elementary Mathematics.—J. Parlseo. London : S. Low & Co.

THE MOST RECENT WORK.

A Seidlitz Powder.—A. Gunn made an examination of some powders and found the blue powder to consist of magnesium sulphate and sodium bicarbonate. The white powder consisted of tartaric acid. Evidently there had been a mistake or else it was a bold attempt to cope with the cutting system and its cheap prices. One wonders that the makers should expect the unusual effect of trying to dissolve the contents of the blue paper to pass unnoticed.—*Pharm. Jour. Trans.*, 1894, 534.

Ointment of Mercuric Nitrate.—C. H. La Wall (*Amer. Jour Pharm., 1894, 525*). The following fats have been suggested as a substitute for the lard oil : Neatsfoot oil, lard, butter, peanut oil, almond oil, caster oil, palm oil, bear's oil, ox marrow, beef suet, stearic acid, petrolatum, and almost all of the other fats from the animal and the vegetable kingdoms, and even one from the mineral kingdom, appear to have been experimented with in the vain hope of finding some fat or oil which would make a good and durable ointment.

Several writers have taken another course and have tried to preserve the products obtained from former processes. One advises keeping the ointment in a jar and covering it with a layer of glycerin to prevent oxidation; others have tried the addition of camphor ; still others have given their attention to the mercurial portion of the ointment, and suggest making the nitrate from the oxide of mercury instead of making it from the metal. Some have even been skeptical as to the reliability of any process, but those who have approximated the truth more nearly are they who advise careful manipulation, especially as regards temperature.

The author employs the official ingredients and quantities and heats the lard oil to 100° C., removes heat, and adds the nitric acid without stirring and reapplies heat when effervescence ceases until all gas is expelled. It is best to use a vessel of six times the capacity of the quantity to be made to allow for the copious effervescence which takes place. When the foregoing mixture has cooled to 40° C., the solution of mercuric nitrate is added and the temperature is raised gradually to 60° C., and maintained until no further evolution of gas is noticed. If it is then agitated until cold, as usual, the resulting product will comply with the requirements of the Pharmacopœia.

Ointment made by the U. S. P. method, which has become spongy, may be remedied by elevating the temperature to 60° C. and cooling with agitation.

Typical Bacilli.—*E. Klein* [*Quart. Jour. Micros. Sci.*, 1894, 1—9 (1 *pl*)] concludes from observations on the bacilli of anthrax diphtheria, and tubercle, that these species are not such typical bacilli as they are usually represented to be. For though under many conditions their morphological characters are those of typical bacilli, yet under others they revert to or assume forms indicating their relationship to Saccharomyces or a still higher mycelia fungus. In the case of anthrax, the typical bacilli may be represented by oval and spherical bodies, some of which may contain vacuoles, and under conditions (early stages of growth on plates composed of beef bouillon, gelatin 10 per cent., pepton 1 per cent., salt 1 per cent.), the colonies are composed of large spindle-shaped, spherical or oval elements in which vacuolation is frequent. Similar appearances are to be observed in colonies of the thrush fungus. From this it is inferred that while *B. anthracis* is a typical bacillus as a pathogenic microbe, yet in its early stages of growth on gelatin it may assume characters having much resemblance to *Saccharomyces mycoderma* or *Oidium* and thus return temporarily to an atavistic stage in its evolutionary history. With regard to *B. diphtheriæ* the author points out that the club-shaped expansions of one or both ends are not to be regarded as due to involution, for both under natural and artificial conditions where there is active growth these expansions will be found, and have moreover a striking resemblance to the ends of growing hyphæ. Their existence, therefore, is only to be explained by their representing a relationship to a mycelial fungus. In the case of the tubercle bacilli, preparations not unfrequently show threads or filaments composed of unequal elements, some of them being conspicuous for knob-shaped expansions, similar to those of diphtheria. Such appearances occur not only in sputum but in artificial cultivations, e. g. glycerin agar after some weeks incubation at 37°. All these preparations behave in the same way as *B. tuberculosis* when treated with appropriate staining reagents; and that they are not involution forms is evident, as the unbranched nature of the filaments and the existence of lateral bulgings prove that they are in an active condition of growth.

Lysidin.—Ladenburg describes a compound obtained in the state of hydrochloride by heating ethylene diamene hypochloride with sodium acetate. The composition of the freebase is $C_4H_8N_2$ and is termed *lysidin*. The aquems solutions dissolve uric acid and the application of lysidin in the treatment of diseases arising from the secretion of uric acid is being investigated. Grawitz describes it as a crystalline body of a light red color, readily soluble in water and possesses a peculiar taste. It is administered in doses from 15 to 80 grains daily, dissolved in carbonic acid-water.—*Deutsche med. Wochenschr.*, 1894, 786.

Gaseous Formaldehyde—R. Cambier and A. Brochet prepare this aldehyde for disinfection in two ways: 1. By the depolymerization of trioxymethylene by heat, and, 2. Direct production by the incomplete combustion of methylic alcohol. Formaldehyde possesses antiseptic properties only when it is in the condition of a gas. On cooling, ordinarily, it is spontaneously polymerized to an inert solid. If it is allowed to cool, in the presence of much air this process does not take place and hence the formaldehyde retains its bactericidal properties. Experiments made at the bacteriological laboratory of Montsouris have enabled the authors to sterilize the ordinary dust of rooms as well as cultivations of various pathogenic micro-organisms.—*Compt. Rend.*, 1894, *No.* 15.

NOTES HERE AND THERE.

Soda Water.—In Byron's "Don Juan" we find the following in Canto II., 81, 186:

Ring for your valet—bid him quickly bring
Some hock and soda water, then you'll know
A pleasure worthy Xerxes, the great king;
For not the best sherbet sublimed with snow,
Nor the first sparkle of the desert spring,
Nor Burgundy, in all its sunset glow,
After long travel, *ennui*, love or slaughter,
Vie with that draught of hock and soda water.

The Essenee of Rose Industry in Turkey.—The *Bulletin du Musée Commercial*, in its issue for September 1st, states that the essence of rose industry in Turkey, which was until quite recently one of the principal resources of Eastern Roumelia and the principality of Bulgaria, has within the last few years shown a decided decline, the falling being the quantities and values of the exports during that period:—1889, 2,767 kilos., valued at 1,542,544 francs; 1890, 3,163 kilos., valued at 1,771,427 francs; 1891, 534 kilos., valued at 317,937 francs; 1892, 439 kilos., valued at 267,379 francs. In 1893 the value of the exports was only 143,185 francs. This decline is due largely to the fact that in France, Germany, and in several other places in Turkey besides Roumelia a development has taken place in the growing of roses, so as to provide to some extent for the requirements of consumption in these places.—*Brit. and Col. Drug.*, 1894, 421.

Alumni Association.

Minutes of the Executive Board meeting held January 9, 1895.

The meeting was called to order at about 8.30 P. M. by the President. There were present Miss K. C. Mahegin and the Messrs. Graeser, Henning, Ehrgott and Hoburg.

On motion, the reading of the Minutes of the last Executive Board meeting was dispensed with.

Reports of Committees:

The Letter-Box Committee reported progress, and that the "box" will be up in a few days.

Motion made and seconded that the Alumni Room Furnishing Committee be discharged with the heartfelt thanks of the association, and that the Secretary notify the chairman of said committee, Mr. Hohenthal, of this action. Motion carried.

The report of the Treasurer was very satisfactory, and was forthwith adopted.

The business manager of the JOURNAL reported it as being in a very flourishing condition, which reassuring report was gladly adopted.

After having duly notified the following gentlemen, they were to-night dropped from membership in the Alumni Association, a motion, which was seconded and carried having been made to that effect, and that the Secretary request the return of their certificates of membership, according to a clause in our Constitution to that effect. These gentlemen are Messrs. George W. Snedeker, A. Zimmerman and A. T. Halsted.

The resignation of W. M. Rheineck was recently received, and since he gave sufficient reason for so doing, his resignation was accepted with regrets.

The resignation of Mr. A. Henning as Business Manager of the JOURNAL was also handed in this evening, and under the existing circumstances it had to be accepted, with the sincerest regrets of the association.

It was then regularly moved and seconded that the salary of the editor of THE ALUMNI JOURNAL be increased on account of three extra issues of the JOURNAL per annum.

After a very interesting discussion of important business for an hour or so, the meeting came to a pleasant termination.

W. A. HOBURG, Jr., Sec'y.

THE following list of names are of persons who have changed their addresses and consequently the Treasurer of THE ALUMNI JOURNAL is unable to supply them with the information that they are entitled to. If these persons or any one knowing of their addresses will communicate with Mr. A. Henning, this end will be attained:

Adam Vogt, 787 8th avenue, city; A. Levy. 125 Grand street, city; G. J. Wolston, Cortland, Cortland Co., N. Y.; H. W. Walp, 536 5th avenue, city; Gustav Katz, Lenox avenue and 125th street, city; Alfred Miller, 537 9th avenue, city; Fred. T. Hartman, 703 3d avenue, Brooklyn, N. Y.; Thos. H. McDonald, Cairo, Ill.; A. J. Van der Bergh, 213 6th avenue, city; C. E. W. Lewin, 106 2d avenue, city; Emil Th. F. Holthusen, 20 Rutger street, city; Emil Buchler, 100 St. Marks Place, city; Frank K. Burr, 821 7th avenue, city; A. W. Moschowitz, 1099 Broadway, city; L. D. Huntoon, Port Oram, N. J.; Chas. E. Stammler, 172 Varick street, city; Chas. H. Everest, 27 West 34th street, city; Edward Stone, 1501 Broadway, city; Fred, Peiter, 301 3d avenue, city; Major C. Brown, 874 Broadway, city; Louis Hess, Scranton, Pa.; A. Zimmerman. 561 5th avenue, city; Otto C. B. Grom, Denver, Col.; Jacobo Alvarado, Paso del Norte, Mexico; G. S. Badger, 52 East 42d street, city; Frank A. M. Schleiff, 242 East 27th street, city,

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"We'll learn the perfect skill,
The nature of each herb to know,
Which cures and which can kill."

College Notes.

MARRIED.—Smith Ely Jelliffe, M. D., to Helena Dewey Leeming, both of Brooklyn, by Rev. Dr. Kelsay, of Brooklyn, assisted by Rev. T. LaFleur, of Montreal, Thursday, Dec. 20th, 1894, In the 6th Ave. Baptist Church, Brooklyn. at 8 P. M.

'94 NOTES.

APROPOS of the New Year, it is seemingly proper that we should endeavor to surpass our former records by carrying out such resolutions that we may deem proper both for the welfare of ourselves and the gratification of our associates.

AT the present time, I think one of the most important resolutions should regard the memory of our Alma Mater. Therefore let me suggest that the bonds of friendship that have hitherto existed, be not cast asunder, but on the contrary, be more tightly strengthened. Let us in the strife and turmoil of commercial life, pause, if but for a moment and think of the pleasant days spent at college, the recollections of which not even time can efface from our memories.

To enable us carry out this resolution, our Alumni Association has extended their characteristic hospitality by inviting us to their monthly lectures, therefore why should we not show our appreciation of their kindly feeling, by taking advantage of the opportunity, and thus not only serving to further make these meetings enthusiastic and successful ones, but also demonstrating to our fraternal friends that sociability is not a lost art among us.

EX-SECY INHOFF is at present in Colorado seeking the high altitude of the Rocky Mts. as a substitute for the many panaceas, usually recommended for obesity. Last reports were to the effect that the trip was not taken in vain.

DESPITE the prevailing rain and cold winds, many of our "Gilded Pharmacists" braved the elements in order to have Prof. Haubold give them a few "pointers" on digestion. It is needless to say that they were liberally rewarded, for, who would not enjoy the pleasure of an "Iodine Sandwich with a test tube of genuine pancreatic juice on the side," handed him, particularly when the latter was the self-sacrifice of a wandering specie of canine.

Our class was represented by Messrs, Race, Burger, Ely, Hutchinson, Struck, Pond, Krueder, Katz, Wurthiman and Stoezer, who did justice to our familiar. Pento! Meta! Boraci!

EX-SEC'Y Linnig has been advised by his physician to drink no more water as its reaction on his cast iron constitution might result in an incrustation commonly known as Rust.

Mose Katz as bright and jovial as ever is still with Messrs. J. N. Hegeman & Co., 3d Ave. and 31st St. He anticipates being present at most if not all of the Alumni lectures this winter.

FRED HILTZ left for Cleveland, Ohio, a few weeks ago. He anticipates entering the Medical University of that city next year; subsequently he will finish in the P. and S. College, this city under the guidance of Harry W. Carter, Ph. D., A. M., of Brooklyn.

JOHN P. WILCOX is located in Plainfield, N. J.

ONE of our most successful graduates is Aug. W. Brater, who together with his brother is conducting a cosy pharmacy on Park Ave., cor. 76th St. Brater is as energetic as ever and devotes no little time in making an exquisite window display, which is the admiration of the neighborhood's fair ones.

ARTHUR BASTEDO is indeed quite a genuis, for besides attending to his duties with Caswell & Massy, he has found sufficient time to dissect several times a week at the P. and S. College, which will be an advantage to him when he commences the study of medicine. Arthur has also joined the Alumni Association and is such an active member that he may be found at all their meetings.

THROUGH the endeavors of J. Remington Wood (with a little bunch of whiskers on his chin), we hope to have a reunion dinner before commencement. His success on former committees of this kind gives us every confidence of his ability to make such an occasion a success at this time.

THOS. E. DAVIES is hospital stewart of the Eighth Battalion, N. G. S. N. Y., and a quite popular one too. At their receptions and drills the Red Cross of his uniform is always conspicuous. He spent two weeks in State camp during the summer, of which his reminiscences are many as well as interesting. Mr. Davies has just met with a severe loss in the death of his Father.

NELSON S. KIRK, PH. G.,
9 E. 59th St.

Senior Class Notes.

D. M. WELLS on returning home one evening found his room in a somewhat disjointed condition. The bed was taken apart, pillows tacked to the wall, and books, clothes, ladies' photos and old suspenders heaped up in artistic fashion on the floor. He thought the place was struck by lightning, but was informed that it was the work of a couple of friends who had called to see him.

The servant girl has a gun loaded. So beware, Cooley.

Wells says home coming is not pleasant when you have to climb through the transom to get into your room.

FOR the Johnson & Johnson excursion Brown is going to have his whiskers trimmed, Manville is having his voice scoured; Joe is going to wear his new white hat; Gifford is going to have his hair cut so as to disguise himself; Morse and his extra eyes will be there too; Clarey says I am going if my fair one does too.

Thum is going to have his trousers pressed and his hair banged.

Sherman is going to put glucose on his mustache to swap for cold sores.

Cooley says, no, thanks, I have had the grip twice this year: no cold sores in mine.

Dalton is going to try and keep awake during the entire trip.

The things which are troubling the students:

First—Is New Brunswick a prohibition town?

Second—Is there to be any acts between the drinks?

Third—How many slices of ham between New Brunswick sandwiches?

Messrs. Steihener. Scharnibon and Koerber have been appointed by section one a committee to furnish sauer kraut for that section while on the excursion.

All the boys they will be there,
Vanderbeck will comb his hair,
Kneuper will flirt with the ladies sweet,
While Ferguson cries, when do we eat?

Roberts will bring in his tambourine,
Watling will sing when he is not seen;
Bricks will be placed in easy reach
In case he is discovered making such a breach.

Flick will make a mash I am sure,
While on that plaster hunting tour:
For who could resist such charming eyes,
When on them Flicky only tries.

Boenke will give a song and dance,
McClellan will go quietly off in a trance,
The Heffley boys will spin some jokes,
Which are rivals in age of the mighty Oaks,

MR. H. E. COOLEY, who had a slight attack of the grip, is around again to the rejoicing of his many friends.

THE action of the class in requiring its candidates for Valedictorian to enter a speaking contest to determine their fitness, meets with the general approval of all its members.

MANVILLE admitted that he was Hazy. How about replacing that H with L.

AN INSTRUCTIVE TRIP.

A VERY entertaining and instructive visit was made by a number of students of the senior class, on Saturday, Jan. 12th, to the Mineral Water Works of Dr. Carl H. Schultz.

The trip was arranged by the Pharmaceutical Club, of 37th East 19th St., represented by Mr. T. B Dean, its corresponding secretary, which seems to be especially active as regards our interest and welfare and extends to us the fostering care of a parental guardian. It is due to this club's hospitality and magnanimity that our Glee Club has thrived so wonderfully.

Mr. Dean kindly introduced us to Mr. Louis Waefelaer, M. E., the assistant chemist of the works (Dr. A. P. Hallock, Ph. D., the chief chemist and Dr. Schultz being away at the time), and Mr. Paul Dimmer, the foreman. These gentlemen, starting at the beginning of the works where the croton water enters by five different mains, and followed the course of the water through each step of the process, whereby the water was filtered, then heated to destroy organic as well as to drive off decomposing and volatile organic matter as well as other impurities and the filtered water there distilled by the most practical and complete apparatus conceivable; then the water was repeatedly subjected to tests, for various impurities, in their admirably equipped chemical laboratory, which is also supplied with a room specially devoted to bacteriological work, and a dark room for spectrum analysis and photographic investigation. Here also are prepared the solutions used in making the various mineral waters and where the finished product of the factory is brought before being sent out in order to be tested and to make doubly certain that it agrees with the label bearing the analysis of contents, which is placed on each siphon of water sent out. Here also we quenched our thirst with the products of the stills of this as well as with the products of the stills of other factories.

The carbonic acid gas used in charging the waters also passes after generation through a set of coolers, mashers and purifiers, to completely remove all impurities, and is stored till required for charging.

The whole establishment, embracing nineteen different departments, employs over 250 men and 100 horses; the fountain, bottle and siphon filling department has a capacity of 50,000 siphons or 10,000 gallons per day. The elaborate machinery of the works is mainly the invention of the proprietor, his deceased son and staff; not the least important among which is the invention of Mr. Paul Dimmer.

Mr. Louis Waefelaer, the assistant chemist, is a young mechanical engineer of high standing and has sole charge of the mechanical department. Every department is scrupulously clean and neat, and the employees think Mr. Schultz is one of the best and most liberal men to work for, for he spares no expense in investigations and experiments calculated to improve the accuracy and purity of the products of his works, and the safeguards against accident to employees are both numerous and well devised. Several other parties will be formed, from the senior class, during the course of the term and will visit and be shown the workings of this "model establishment."

CLASS REPORTERS.

Junior Notes.

IN MEMORIAM.

B. C. MEANEY, entered into rest, Sunday, January 6, 1895, in the 22d year of his age. This brief announcement reminds us of the loss and sorrow to so many near relatives and friends, that after the few weeks that have elapsed since their hearts were wrung with grief. We venture to say something of him whose earthly sojourn is ended.

Possessed of a genial happy temperament, a character so manly, conservative and refined. that professors as well as students rendered to him an involuntary tribute of respect. In the three months that the junior class has been organized, few students have become better known or more popular than Mr. Meaney.

Just before the college closed for the Christmas vacation, he said to a friend, "I think this will be the happiest Christmas I have ever had," and now who that knew him can doubt that this strange prophecy has been fulfilled.

J. Y. C.

CLASS MEETING.

THE meeting was called on Tuesday, January 8 1895, by the death of our classmate, Mr. B. C. Meaney. A motion was made that we send flowers to his late home, which was amended so as to include the drawing up of resolutions of condolence, and sending a copy of them to his parents. Carried.

The meeting then adjourned.

F. H. FINLEY, Sec.

BEFORE vacation it was rumored that our friend and professor, Dr. Jelliffe, was about to become a benedict, and as the rumor has become verified, we, the Class of '96, send to him our hearty congratulations and best wishes for a long and happy life.

THERE is one thing the Juniors should pay more attention to, that is class meetings. If each one who could would come, the difference would quickly be seen. Try it.

THE Juniors in pharmacognosy commenced work with the compound microscope at the beginning of the term.

ON exhibition every Tuesday afternoon, from 4.30 to 5, in Quiz, T.'s hand.

WE are sorry to hear our friend and classmate, Mr. Quickburger, has been hurt, and hope it is nothing serious. He was thrown from a cable car against a post on Tuesday, and was picked up insensible. The car was just making the turn, which it does in a rapid manner, and it is supposed he had no hold.

A GREAT many cases of mustaches have broken out among the Juniors. In most cases, however, it is only a light attack, and not at all serious.

THEY say the back part of the Botany Quiz room was very warm the other day; in fact, some of the boys were nearly roasted.

DID I hand in that joke I heard in Quiz the other day? If not, why not? It would have helped to make the page interesting this month. Two weeks no college. Reporter with one week. He will do the best he can, but every little helps.

REMEMBER, this page is for the Class, not individuals, and every time you help make the Junior page interesting you are doing the Class a favor as well as the reporter.

ALL communications for Junior notes should be addressed to J. Y. CANTWELL,
261 West 42d street.

MEDICINE AND PHARMACY.

BY N. H. MARTIN, F. L. S., F. R. M. S.,
President of the British Pharmaceutical Conference.

(*Continued from December issue.*)

Doctor's dispensing is stated by many to be one of the chief if not the chief cause of the ills from which pharmacy is a sufferer, and demands in more or less dignified terms are made that this iniquity shall cease. I make no apology for the existence of this condition of things. Theoretically it is undoubtedly better that dispensing shall be done by the pharmacist, and prescribing by the medical man, but when we pharmacists claim this as a right, and accuse medicine of unjustly usurping our functions, it is well for us to remind ourselves that medical men, although they may not now as frequently as of old take the degree of L. S. A., are the direct and legitimate successors of the old apothecary and that the dispensing of medicine was their legitimate funtion. So much was this the case that there being a doubt as to whether it was traversed by our own Act of 1868, the short Act of 1869 was passed to preserve the right. Then again it is deep rooted in the habits of the English people to expect the doctor to supply the medicine he has prescribed, and any change can only come about by the slow process of educating the patients and by the exhibition of good will and feeling between medicine and pharmacy. Before it can happen universally there is no doubt that pharmacy must have acquired such a professional standing and education as will enable it to perform its delicate and confidential function with the tact and reserve which is the outcome of prolonged training. The mistake (a very common one) which pharmacy is making, is that it wants the reward before it has made the effort and suitably equipped itself for the service. I exhort the pharmacist of the future to be unremitting in his efforts to raise himself and his calling to a professional status, and then I predict for him that in the natural course the dispensing of medicines will come to him.

Chemist's prescribing is quite as loudly complained of by the doctors, and when I read some of the letters and comments which appear in the medical journals I am almost tempted to fear that for once medicine is thinking more of its share of the pecuniary reward, than caring for suffering humanity. There is, however, I am sorry to say, a great deal too much prescribing by chemists, and some of it is of a most reprehensible kind. I know a case where a chemist treated a man suffering from rodent ulcer of the face for two years, all the time buoying the man up with the hope that it was getting better, and that he would cure it, until the face was so bad, and the ulcer had spread to such an extent that when it came under the notice of the surgeon nothing could be done for the patient. If that chemist had met the man upon the highway, and robbed him, he would have been liable to imprisonment, but having got the man into his shop he not only robbed him of his money, but he rendered it impossible for the man ever again to be restored to health. For the dishonor which such men bring upon pharmacy, and for the irreparable injury which they inflict upon suffering humanity I should like to give them several years of penal servitude. But there are innumerable small accidents, and little ailments to which humanity is liable, which quite legitimately come within the province of pharmacy to treat, and the pharmacist, if he is wise, is a much safer man to treat these than the clergy and the laity, who are ever ready to prescribe for each other upon any and all occasions. The best and wisest exponents of medicine admit this right on the part of pharmacy, and welcome the service which is rendered by it to sufferers. Pharmacy may make some mistakes, but I know it frequently sends patients to medicine long before they or their friends would think seriously enough of the case to do so.

There should be no rivalries or jealousies between medicine and pharmacy, and the better qualfied each of these may be to exercise its own share of the duties devolving upon both, the more will each of them respect the rights and the work of the other.

Before I conclude, one word on the principle upon which remuneration should be based. This is a question of the utmost importance to the English public, as well as to the pharmacists. John Ruskin says, "You do not pay judges large salaries because the same amount of work could not be purchased for a smaller sum, but that you may give them enough to render them superior to the temptation of selling justice." We cannot err in applying this principle to pharmacy, and deciding that the dispensing chemist must be paid at a rate of remuneration which will enable him to get his living honestly and openly, and render him superior to the temptation to increase his profit and his income by tampering, in ever so small a degree, with the quality of the drugs he uses, and with the health, and may be the lives, of dear ones, and of men important to the community. His remuneration should also enable him to devote sufficient time and care to every detail of his responsible work, and eliminate a very real source of danger which is unavoidable if the haste and the bustle of trade methods are adopted by pharmacy.

The Conference has entered upon the fourth decade of its existence, and, possibly, I should have made a better and wiser choice if I had addressed you upon its past achievements, and its future prospects, but the other matters upon which I have touched seemed to me of greater importance. Let me say, however, briefly, that I think the record of this Conference has been eminently an honorable one, and that it has fulfilled, in a high degree, the functions for which it was called into existence. The story is written in the Year Books, and another phase of it is engraved in the hearts and memories of many of us who have been members almost from the beginning, and who have attended a large number of its meetings. It has added to our knowledge, enlarged our experience, and broadened our intellectual grasp of pharmacy; and last, but not least, it has been the means of bringing together, introducing to each other, and cementing friendships between men who practice a common avocation in districts as wide apart as Inverness and Cornwall. In this latter function the excursion on the last day has played no inconsiderable part. Amongst the critics of the Conference there are some persons who affect to sneer at the excursion as if it were sheer frivolity, and was at variance with the avowed scientific objects of the Conference. I beg to differ, and to claim for the excursion day a very high place in the work of the Conference. It affords the opportunity, as no other arrangement could do so well, for men to meet; and I am quite sure that my own experience is by no means singular when I tell you that many, very many, of the best friends I have in pharmacy were first known to me through the opportunity of one of the Conference excursions; and further I could not exaggerate to you the benefit which I have received from the numerous conversations and informal discussions which always takes place on these days. But it is with societies, as with individuals, they tend to decay, and already, more than once we have the alarm: the Conference is on its last legs! I do not believe it, as I feel sure it fufils a purpose in the realm of pharmacy which is too important for the Conference to be left to decay, and if we neglect the trust which has been handed down to us, our successors will revive it. I would ask every member of the Conference to get, at least, one other member to join, and I do not think he can use a stronger argument than that, apart from the opportunity of attending and taking part in this annual scientific gathering of pharmacy, the Year Book, which he will receive, is worth many times the subscription. The Year Book of Pharmacy should find a place on the desk of every chemist and druggist in this land. In it he will find abstracts of papers from a larger number of sources than he can possibly consult for himself, and many of these papers may be of great value to him

There is no occasion to disguise the fact that we do not get as many or possibly as good papers sent to the Conference as we should like, but when we consider the needs of a weekly press and the number of small societies which absorb in the aggregate a large number of papers, our experience need cause us neither surprise nor alarm. I should like, however, to ask many of those who are doing original work and writing papers in connection with pharmacy to consider whether there is any place so suitable for them to be read as at these meetings.

The authors may feel certain of a larger audience to listen to their papers and a far more capable set of men to discuss them than can be found at any other time or place. In provincial towns the papers are read to a few local men, and the discussion is taken part in by fewer still, and even at the monthly meetings at Bloomsbury Square the discussions have a great tendency to fall into the hands of very few men. However capable these men may be, they cannot possibly have the wide and varied experience of the aggregate of the men who attend this Conference. I would, therefore, venture to urge thoughtful pharmacists to contribute papers to this Conference, and I should like them to come in such numbers that we may be compelled to add another day or two to our meeting.

I mentioned just now the friends whom whom we have met at these Conference meetings, and before I close I must briefly allude to those we have lost. The first name that will occur to you, I am sure, is that of our genial botanist, the late Professor Bentley, who was president at Nottingham in 1866 and Dundee in 1867. Many of us knew him first and best at Bloomsbury Square as our dear and honored teacher, but to many others the Conference must have been the means of their meeting him, and by all was he respected and beloved. He reached a good ripe age, and of him it might be said—as of many other men who have lived and been true to themselves and their calling—"He has done his work well and earned his rest." The next, an even greater loss to us as a Conference, because of his younger age and the promise there was in him of greater achievements for pharmacy, is our late treasurer, Mr. R. H. Davies, I, with many others, made his acquaintance through this Conference, and I feel, as I am sure many of you do, that I have lost a personal friend with whom intimacy would have ripened year by year into stronger bonds.

OFFICINAL OR OFFICIAL.

In the *Pharmaceutische Rundschau* for January, 1895, is found an interesting discussion on the use of the words officinal and official by Theodore Husemann, of Göttingen, and Charles Rice, of New York. It would be interesting to our readers to give the views of both of these well-known writers in full. At present, however, we reprint in full the views of Dr. Rice :

"In compliance with a request by the editor of this journal, the writer presents a few facts, as well as his personal views, regarding the use of the words "official" and "officinal" when applied to drugs and medicinal preparations.

It should be stated at the outset that the writer accepts the ordinary derivation of the two words, and the meanings assigned to them in accordance with their origin. Nor does he deny that it has been customary, up to within a few decades, to apply the English word "officinal" quite generally in the sense of "pharmacopœial." Yet, within the memory of most readers of the *Rundschau*, voices arose in favor of a change, the word "official" being proposed to replace "officinal" in the special sense of "pharmacopœial." It is evident that some cause arose which produced the feeling that such a change was necessary and the cause is not far to seek. In those countries in which the exercise of pharmacy is under the control of the government, and where the stock of a pharmacist, so far as it is used in physicians' prescriptions, contains comparitively few remedies besides those directed by the Pharmacopœia, the two meanings of the word "officinal," viz: 1, the original one "pertaining to an 'officina;' pertaining to or kept in a drug store," and, 2, the more modern one, "pharmacopœial; authoritative," practically cover each other. This is particularly the case in Germany, where the word "officinell," and in France, where "officinal" is in general use in the second sense mentioned above. It is different in this country, where the pharmacist is compelled to carry a large stock of non-pharmacopœial preparations, many of which are prescribed by physicians.

The two meanings of the word "offiinal" have two widely differing boundaries. They may be likened to two concentric circles. In the first mentioned sense ("kept in a drug store") the word occupies the area of the larger circle ; in the second sense ("pharmacopœial") usually that of the inner, smaller circle. In some parts of this country the inner circle—to continue the simile—is much smaller in proportion to the outer than in others. In some it may attain an area of perhaps three-fourths or four-fifths of the larger ; in others it may even outgrow the former outer circle. Only in rare cases will the peripheries of the two circles coincide. Since the two meanings long ago ceased to cover each other, the necessity arose to use different words to express the two different meanings, and it was therefore, proposed to employ the closely related word "official" in the sense of "pharmacopœial," and to use the word "officinal" only in the general sense "kept in a drug store," which is, indeed, in accordance with its original meaning and origin. Those who object to the use of "official" in the sense of "pharmacopœial" say that *officialis* means "governmental; pertaining to an office or official, etc." That it is, therefore, correct to say, for instance: "The official preparations for the reception of the President are completed," but incorrect to say: "He made all the official preparations in his own laboratory." There is, however, no danger of any misunderstanding in these two sentences, indeed, much less danger than would be in many sentences containing the word "officinal."

Professor Husemann, in his letter, brings within the space of his discussion the terms "medicamenta magistralia," and "formulæ magistrales." He shows, himself, that while the word *officinalis** was, in more recent times, applied to drugs and preparations of an authoritative character or origin, it was formerly used in its broader sense "what is at any time to be had in a drug store," in which sense it was the opposite of *magistralis* (magistral, or magisterial), or that which is not kept ready made, but has to be prepared or compounded extemporaneously. It will be noticed that there is a much better logical correspondence between the terms.

Medicamenta magistralia = medicines whose composition is fixed or prescribed by the *magister* (a person), that is the attending physician, and

Medicamenta officialia = medicines whose composition is fixed or prescribed by an *official* (a person), that is the Committee of Revision as a body—

than there would be between the former and *medicamenta officinalia*, which term refers to the *shop* and not to the *person* of authority.

* Professor Husemann did not find this word in *Du Cange's Glossarium Mediæ et Infinæ Latinitatis*. It is, however, contained in the latest edition (by Favre; Niort 1883-87), Vol. VI, p. 37.

As to the word "unofficinal," this means properly "not pertaining to, not kept by or dealt in by a pharmacist." If used in this strictly literal sense, however, its scope or applicability will become more and more contracted in the course of time, as it may eventually become difficult to mention articles to which the word may justly apply. It should be abandoned altogether. "Unofficial" much better expresses the idea sought to be conveyed by it. A few examples will show the use and meaning of the several words: Fleming's tincture ure of Aconite is not official (or "Unofficial;" not "unofficinal,") but it is officinal. Tinctura Opii Deodorati is official, and ought to be everywhere officinal.

Concerning the right of any person, or body of men, to coin a new word, or to use one already in existence, for the purpose of expressing a new idea, or removing an ambiguity, there can be no question, provided only that the selected word be appropriate and in harmony with the genius of the language. Of course, its acceptance by the public at large, or by the profession, for the use or benefit of which it was coined or selected, cannot be enforced. Yet, if it is found to answer its purpose, and if its superiority over the term formerly used in place of it is recognized, it will gradually and surely come into general use.

The judgment of the writer is that the employment of the word "official" in the sense of "pharmacopœial" is justifiable on linguistic grounds, and that it is, moreover, fully justified by the condition of pharmacy in this country, where a clear distinction between "all sorts of medicines," and "pharmacopœial" medicines" has become necessary. Of course, the Committee of Revision," which hoped to settle the controversy by an "official" vote, according to which the word "official" was hereafter to be used in place of "officinal," when applied to pharmacopœial preparations or directions (see U. S. Pharm., 1890, p. xxxvi.), did not mean thereby to encroach upon the ordinary meaning of the word, which appears, for instance, on the title page of the Pharmacopœia in the sentence: "Official from January 1, 1890."

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Contents.

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CHEMISTRY IN THE UTILIZATION OF RAW MATERIALS.*

BY PROF. ARTHUR H. ELLIOTT.

Ladies and Gentlemen:

I feel very much in the position of a speaker at a public dinner who has been given a toast and then utterly fails to be in sympathy with his toast. Now, it is exactly my position that I am to talk about waste materials in Chemistry and there is no waste the chemist is not capable of utilizing in some shape or form; but I would rather say I will give you a running commentary upon the applications of Chemistry to the uses of various Raw Materials and the products incidental to their manufacture.

I suppose there is probably no similar area of the earth's surface that is richer in resources fitted to the use and comfort of man as is the United States. When our forefathers came here, they found the land sufficient to sustain themselves and their families by the very simplest methods of agriculture, and when we think this is only about two or three hundred years ago it is not uninteresting to note that the once rich soil of Massachusetts no longer exists, and that it is only by the most careful efforts on the part of the agriculturist that the soil of the New England States is made to give a profitable crop.

When we further note that the profitable areas of agriculture are now located West of the Mississippi and Northwest of that region, we are led to ask the question, what have we done with the soil that so readily sustained and supplied our ancestors, that to-day it is difficult to get a living from it? To those who have studied this question, it is readily answered in the fact that we have taken everything that we could get from it, and put nothing back to take the place of the material we have removed. As most of you are aware, the larger part of the plant life that constitutes the basis of vegetable life is taken from the atmosphere under the influence of sunlight and heat, but there is an underlying basic principle of earthy matter which is taken from the soil and is essential to plant life, just as much as the bones of our own bodies are essential to our lives, in fact the plants could no more live than we do without these mineral substances that

*Lecture delivered under the auspices of the Alumni Association of the College of Pharmacy of the City of New York on Wednesday evening, Feb. 13, 1895.

form in many cases a network or skeleton upon which the vegetable principles are built up into an organic structure, just as our own skeleton forms a structure upon which our organic tissues are sustained. Now, this is so important a matter that the best men of our times have given it most serious attention, and every once in a while they put their thoughts into language and it is sometimes truly startling.

In the United States there is still so much rich land left to us that there is no immediate cause for fear, but in Europe this matter has assumed a more serious aspect and it is only a question of time in the United States when we shall have to face this quesition of improvidence,—for these failures to supply the land with the materials we take from it in order to sustain plant life is nothing more or less than improvidence.

The density of population in England is such that the land there is incapable of supporting the people who reside upon it, and few of us stop to consider that it costs $700,000,000 per year to provide England with food which she cannot raise herself. Now, if this is true to-day, it takes but a very simple calculation to show that fifty years from this time, England will have to pay $2,000,000,000 for food for her population that she cannot raise herself. And it is only a fair presumption, that at the present rate of increase of population in the United States and with our present reckless waste of material, we shall be in a similar position to the England of to-day.

We have several ways of overcoming this difficulty, but the most rational is to follow scientific training and appliances, that we may be maintained in happiness and comfort. To put it in the words of an English scientist we have in fact to make our choice between science and suffering, and it is only by utilizing the gifts of science that we have any hope of maintaining our population in plenty and comfort. Science will do this for us if we will only let her. She may be no fairy-godmother, but she will readily endow those who love and trust her. Since it cannot but be, that innumerable and most important uses remain to be discovered among the materials and objects known to us, as well as those which the progress of science must hereafter disclose. We may conceive the well-grounded expectation not only of happiness in the physical resources of mankind and the consequent improvement of their condition, but of a continual power of penetrating into the arcana of nature and becoming still further acquainted with her secrets.

To give you an idea I have a few figures here of the development of waste in the United States. The total acreage of the United States is 200,000,000 acres under cultivation that gives 225,000,000 tons of crops. The mineral matter of these crops is about 9,200,000 tons and the phosphoric acid which is the most important proportion of the mineral matter amounts to 1,840,000 tons, or about 19 lbs. per acre. Now, this is absolutely taken away from the soil and while part of this material is replaced in the straw and refuse that goes back to the land (and it is thus estimated that about 840,000 tons are thus replaced), yet another amount is replaced by fertilizers about 300,000 tons. We therefore return to the soil only about one-quarter of that which we have taken from it. This condition must stop somewhere or the soil will not continue to bear for us.

The application of Chemistry to the Utilization of Raw Materials is one of the most interesting phases of the science, and there is none that is more important to the people than is found in the case of agriculture. Now, it is only about thirty years ago that this subject was taken up with any amount of interest, but it was then that science took a good hold on it and gave such universal interest to the application of chemical principles, that the farmer can raise two or three blades of grass, or wheat, or corn, where he formerly could only raise one.

Liebig, the great father of Agricultural Chemistry, was ridiculed when he said that Chemistry was the foundation of agriculture. The people of to-day cannot realize the ridicule he had to endure, and it was very annoying to those old farmers that a chemist could sit in his laboratory and tell them what to do, which they only had obtained by practical experience and hard labor,—how to raise potatoes, wheat, or cabbages, and yet to day Liebig's ideas are followed to the letter in all civilized countries. By such studies as this we are shown where sugar is found in other sources than the sugar cane, and when I tell you that the beet root, a tuber that formerly was fed to cattle like turnips, and contained but two or three per cent. of sugar, to-day is cultivated and made to yield three or four times as much of the saccharine juice, you will not be surprised to learn that one-third to one-half of the sugar used in Europe is made from this source.

We have been so prodigal with our resources that we constantly hear the remark "the best is not too good for an American," but a day of reckoning is at hand, and in the West we are gathering flowers of the best bloom from the soil. Our cheap beef and cereals can only be produced for a time. What we take from the soil we must put back again if we are to leave it in a condition to utilize the materials of the atmosphere which produce vegetable substances.

We constantly hear of some young man leaving the farm to come to the city to learn a profession, because his father has had a tough time in making a living for his family. In other words men are leaving the soil for the city, and we constantly hear of a lack of efficient labor to cultivate the ground. This is due to the lack of knowledge in the application of the uses of agriculture and this lack of instruction more especially in our public schools is almost criminal. You will find in many country places people learning music and foreign lauguages who can hardly speak their own language correctly, when every one should be learning the principles of life which surround them. Like every other problem of this kind the path to success is beset with difficulties, but yet, as the Greek philosopher said, "Difficulties are the things that show what men are," and it is the overcoming of these in conjunction with Chemistry that I have chosen as my theme this evening.

Agriculture is only one of the examples of waste in the United States. We waste our food; we waste our nervous energy; we waste our lives in our haste to catch the flying bubble in the sunbeam, and which is gone as soon as we grasp it. What we need is meditation upon the laws of life which surround us.

It is curious that some of the oldest manufacturing industries known to mankind involve the use of alkaline substances, and I have chosen several of these industries as types of the application of Chemistry to the utilization of waste as topics to interest you. I have taken one or two examples from the mineral side of Chemistry and several others from the organic, and if I occasionally give you facts and figures which appear uninteresting, bear with me for a little time and before I am through you will probably be thinking more seriously about them than you have been hitherto. My object is to interest you in the science which I have made my life work and before we leave I hope to feel that you have appreciated these efforts.

To begin now with the technical part of my lecture I will say that one of the earliest industries that we have upon the earth is the fabrication of glass. As early as the time of the ancient Egyptians, some say 3000 years B. C., these people knew how to make glass,—a certain kind of glass,—not the glass we know of in the shape of windows, that is a far more recent acquisition,—not even the glass we know of in our utensils and vials, that is a modern acquisition; the glass of small vials (which by the way were used for the preservation of tears in the tombs), for the formation of artificial gems and amulets, charms and things of this kind,—these were the first and earliest efforts of the Egyptians in this manufacture. Now, the materials used in the manufacture of glass are first, sand, combined with some kind of lime or calcareous substance, and another material, a sample of which I have here, in the form of soda. Now, the earliest alkali that was used in the formation of glass was a natural substance that came out of the earth, and of which we have some very wonderful examples in the United States to day. At Ragtown in Nevada and certain other places are alkali lakes, also some places in Colorado near Carson City show an incrustation upon the shores that is practically a crude carbonate of soda,—a similar material to this was found in Egypt and utilized in these crude efforts in the manufacture of glass.

Glass was introduced into Europe during the Crusades, that is the time that the European nation was at war with the Saracens, and the sand and the alkali were brought from Egypt on purpose to manufacture glass. There is a story going that the Queen of Sheba visited Solomon, and he wished to do something very remarkable to surprise her and he caused her to walk over a transparent pavement where she could see the water running beneath and fish swimming in it. This story is probably a fable.

In fact windows were first used during the second and third centuries; in England York Cathedral had glass windows in 1334 and they cost 12 cents a square foot for the greenest kind of glass, to-day we would not use it in the commonest bottles,—they were very expensive and in ordinary houses oil paper and lattice work were used instead of glass. Now, this glass made in the different ways I have mentioned whether painted glass or glass bottles, has 16 or 17 per cent. of the weight of glass in soda or potash or some alkaline materials of that kind.

After the introduction of glass into Europe, it became very evident that the sending to Egypt for the alkali was an expensive arrangement and the people sought to find some other means of getting alkaline substances; they found that the ashes of certain sea-weeds when leached out gave an alkali,—these ashes were called kelp,—the French calling them Varec, and this earthy material of which I have a small sample here was the next substance used in the manufacture of glass.

There was also raised about this time in Spain and along the shores of the Mediterranean certain plants of the Salsola order, called Saltwort and varieties of this kind; they went under the name of Barilla from the ashes of which was obtained a remarkable amount of alkali. The improvement of the alkali brought from Spain ruined the kelp industry as it was so much better than this kelp or Varec used before and burnt along the coasts of Scotland and also on the coast of Ireland that the industry almost failed. This state of affairs continued up to about the beginning of this century. In 1799 a Frenchman named Leblanc invented the method of obtaining the alkali from common salt. I want to tell you something that may be interesting. We have to-day in the United States glass works running that were started simultaneously with the introduction of the Leblanc alkali,—the Glass works at Glassboro, New Jersey, which were started in the year 1775.

Another industry that involved the use of alkali was a substance used by man to keep himself clean. I must say that the earliest efforts of men to keep themselves clean were very curious and involved the use of juices of certain plants, and one very curious method was the use of the so-called Fuller's earth, a kind of ferruginous earth which was painted upon the skin, and then beaten off again; you were painted, then you brushed yourself after becoming dry, and that cleaned you. Now this curious method of using something to take the dirt off the skin was used as late as the 12th century by the Romans. At the time of the use of this material Pliny tells us that soap was made by the Gauls with fat beechwood ashes. The first factory was at Pompeii and the kettles and utensils were found well preserved when they were excavated. From 7 to 9 per cent. of alkali is used in making soap and is one of the chief articles of commerce to-day.

Soap making as an art was practiced in Italy and Spain in the 8th century and it took five hundred years after that to convert other nations to the use of soap. It was not until the 13th century that it was introduced into France at Marseilles on the shores of the Mediterranean. The Marseilles Castile soap was made of olive oil and soda and potash during the 13th century; along the shores of the Mediterranean were found certain marine plants that gave ashes rich in alkali, and although France produced a great deal of olive oil they found it impossible to raise sufficient to supply her soap manufacture and they afterwards went to Italy, so that Italy and Spain were led to compete with France for the preparation of Castile soap. Spain also continued to develop the growth of salsola or the ashes of the saltwort, the particular plant that gave the alkali necessary to the soap manufacture. The Gei mans were the first to produce soft soap to get hard soap by salting out. When I tell you that at this stage of affairs the alkali for these manufactures both for soap and glass cost twenty times as much as it does to-day, you can see how hard or how expensive it was to keep clean.

Incidentally to the preparation of soap and also in the preparation of some kinds of glass, wood ashes were used, and the ashes were leached out and gave what we term potashes and what we know as carbonate of potash to-day. Sea-weed ashes contain varying amounts of potash, some of them only one-half of one per cent. of potash,—others like the Fumitory contain about 80 per cent. of carbonate of potash. In the early history of this country potashes for the manufacture of soap and glass was a material of export to Europe and was a very important matter, and 16,000 tons of potashes were formerly exported, made from wood ashes. To-day, there might be a great deal more of this material saved if people would take the trouble to collect waste woody matter. As an example take corn cobs. These contain about 1 per cent. of carbonate of potash. There are 1,100 million bushels of corn raised in the United States; these give 14 lbs. of cob to the bushel, which is equal to 7,700,000 tons of cobs, and would give 115,500,000 lbs. or 51,000 tons of carbonate of potash. All this goes to waste.

I said a few minutes ago that ashes and seed-weeds were used in the manufacture of glass, they were also used in the manufacture of soap. Now, before the introduction of barilla or the ashes from saltwort from Spain, this sea-weed industry was important in the manufacture of kelp and was an important industry on the coast of Ireland before the year 1700. In 1730 it was introduced into Scotland by Mr. McLeod as a source of carbonate of soda and gave a product worth $100 per ton. Scotland produced 20,000 tons per annum. Now this material comes from certain sea-weeds which are known under various names; they are Yellow Wrack, Black Wrack. I have some samples of the small varieties. You know what Irish Moss is, and I have here through the kindness of Dr. Jelliffe and Dr. Rusby some samples. Now, there are some mounted samples here, you can see the kind of algæ they are. There is also a certain Euchemia sea-weed, — you know the variety of Agar-Agar, the Japanese material. Then we have a very curious kind of sea-weed, called Laminaria, or the sugar-wrack as it is sometimes called. Here is a small specimen of it very beautifully mounted, and I have here one of those large ones, —it is broken, and this piece should be added on the end here; it is about 8 ft. long. The peculiarity of it is it produces a sweet material which we have learned is manna sugar. Seven per cent. of it is produced by a kind of fermentation. Then there is Fucus, the bladder-wrack, —these are here, all mounted carefully and give you an idea of the kind of plant life which produce this sea-weed. They all produce soda and were the only sources of alkali for making glass and soap.

There are certain giant algæ. Here are some small samples that grow along the coast of Scotland, 1,500 feet or a quarter of a mile long and this d'Urvilleæ is like a tree in the ocean, it has branches 12 or 14 feet long and a trunk a foot in diameter; these are the kind of sea-weeds used in the production of kelp and also of algin. You must not suppose that this kelp that you get is the same in all cases; some varieties give an excess of potash salt and some varieties give an excess of soda. The kelp variety when they wash out will give from 86 to 90 per cent. of salt. Now, in conjunction with the kelp I want to speak of iodine. In getting kelp it was easy to obtain the salts. In 1812 Courtois discovered iodine. He was making potashes in order to make nitrate of potash and he found a certain substance that acted upon his kettles and corroded them,—it gave a violet vapor, and he called it iodine from iodus, a Greek word for violet. The larger part of these sea-weeds give us this iodine,—the one which you can test for yourselves is common Turkey sponge; the sponge contains about 2 per cent. of iodine, and it can be readily detected. Now at the beginning of this century this material was worth about $100 per ton and it was used for soap and glass. Incidentally to the composition of iodine I may say whatever the amount of iodine contained in the ashes of the sea-weed there is 1-10 of bromine in the same material. The larger algæ such as d'Urvilleæ give us very little iodine, but they give potash salts. Laminaria and similar varieties give 10 lbs. of iodine to the ton, common Fucus, Black and Yellow Wrack, like this, give only about 1.3 to 2 lbs. of iodine to the ton. There is a variety called sea-oak, I don't happen to have a sample of it, that gives about 4½ to the ton. The method of burning to ashes in pits, kilns and holes spoils it for iodine.

Now, a gentleman in Scotland took this subject up some years ago,—he made some very remarkable experiments and also some immense improvements in the production of iodine. Mr. E. C. Stanford conceived the idea of submitting the dried algæ to destructive distillation in closed vessels, the same way that we submit soft coal for making gas, and in that manner he obtained a charcoal corresponding to the coke of the gas works, a tar similar to coal tar but of very little value, and also some ammonia. The beauty of this arrangement is that the charcoal contains the whole of the iodine and the sea-weed charcoal after leaching is a good decolorizer. He then tried macerating material of that kind called Laminaria, found along the coasts in such abundance, and he got the iodine in soluble portion, and the insoluble portion he used in making a substance that he called Algin, a glue-like body having practically all the properties of gelatin. Mr. Stanford said : "100 tons of dry Laminaria burnt for kelp will give me 9 tons of salts and 270 lbs. of iodine; if I char it in a retort I get 15 tons of salts and 600 lbs. of iodine, or more than double that from burning, and I get 36 tons of charcoal,—at the same time I get some ammonia. Now, by maceration from the 100 tons I get 68 tons of soluble,—the water extract is 33 tons, giving salts 20 tons and iodine 600 lbs. and the Algin and Angelose."

So, to-day, by an improved method of treatment, instead of being subjected to the careless action of burning, the sea-weed is treated either to destructive distillation or maceration, and a scientific method has been applied to these large growths of sea-weed. But the application of chemistry to the utilization of another waste material threatens the sea-weed industry of Scotland. I refer to the nitre or nitrate of soda beds of Peru. Some industrious chemist analyzed the nitrate of soda as it occurs in the beds in Peru, and found it contained sodium iodate, and it required a good careful analysis to detect it. He then found that if you analyze the mother liquors after you have obtained the nitrate of soda, which is already a commercial product, that they contain 22 per cent. of iodate of sodium—or, to put it in pounds, 3.8 lbs. to the ton of original raw material taken out of the earth. That means about 1.10 to 34.100 per cent. on the commercial nitrate of soda produced, and this would give 2,800,000 lbs. of iodine. Now, the amount of iodine used in the world is about 600,000 lbs., of which France and England produce about one-fifth; the rest of it comes from Peru.

The industry of burning sea-weed that Mr. Stanford has given attention to, and has made his life work alone, has benefited a large number of people living in those rocky islands in the North of England and Scotland. The Algin which I mentioned as a new glue-like substance is something of the character of gelatin ; the principal difference is in the amount of nitrogen it contains, otherwise they appear to be practically the same substances. In the Algin the nitrogen is a little less than 4 per cent., while in the case of gelatin it is 17½ per cent.

The search for alkali to produce soap and glass, and I am still talking about these raw materials (incidentally I spoke of iodine), was kept up because the materials they used were so expensive, and such a material as wool was found to contain certain potash salts. Here is some raw wool; you get raw wool fat from the fleece of the sheep ; you get certain grades and ultimately the pure wool fat that you know is lanolin. Now one-third of the wool on a merino sheep is a mixture of wool fat and a potash soap, it is about one-seventh or 14 per cent. of ordinary wool. A thousand pounds of wool will give 140 to 180 lbs. of this raw wool fat and potash soap ; that means about 70 to 80 lbs. of carbonate of potash. There are 600,000,000 sheep used in the United States ; they are worth $150,000,000 in the shape of wool and mutton. There are 10,000,000 sheep in Buenos Ayres that are boiled for nothing but the tallow and this wool. The total amount of wool grown in the United States is 250,000,000 lbs.; the wool fat is 45,000,000 lbs. and the potash salts are 300,000,000 lbs. from the same material. France utilizes some of this material in the making of potashes by burning it, and in the use of carbon disulphide by extracting the wool fat. In the United States they use gasolin for the latter purpose, and the potash soap is left behind in the fleece, and when washed out with water, contains 6 to 19 per cent. of carbonate of potash. France and Belgium brought this industry to a very high pitch, and made 2,000,000 lbs. of carbonate of potash from wool every year.

Since the production of sugar from the beet root was put in force, a large quantity of molasses is produced ; that they cannot even use on buckwheat cakes because it tastes badly : the first thing they do with it is to utilize the sugar in it ; they do this in the process of fermenting it, and they get a liquid containing from 4 to 5 per cent. of alcohol. The residues in the stills are called Vinasse, and they practically consist of what is left in the beet-root molasses : these are mixed with chalk and then evaporated ; lime sulphate crystallizes out and is separated ; the rest of the liquor is evaporated and incinerated for potash salts.

In Europe there are some 500,000,000 lbs. of molasses made from the beet root every year that have 5½ per cent. of potash in them. After it is taken out and incinerated, it gives a commercial substance that is called Salin, and which contains from 42 to 52 per cent. of potash carbonate, and is very valuable.

So much for utilizing kelp, the potash from wool and the potash from the beet root, all these things were used for making soap and glass. When Leblanc discovered or rather worked out the process of making soda, he took a common material like salt, made salt cake with oil of vitriol. mixed the salt cake with coal and limestone in a furnace, and he produced what is termed black ash, and then from that product by leaching and evaporation he gets this material which is soda-ash. The black-ash contains from 37 to 41 per cent.; that is about the average ratio of carbonate of soda ; it contained a great deal more soda than sea-weed or any natural product ; some of the natural alkali contains more than this, but not much of it is found. To give you an idea of the enormous amounts of these materials used in the United States, I will simply say that the total amount in 1890 was 997,000,000 lbs.; in 1890 only half of these were imported, and to-day the United States is making some show and producing 364,000,000 lbs.

This process of making soda by the Leblanc method went on for a great many years until somebody conceived the idea of making it cheaper than by the method of Leblanc, I refer to the ammonia process invented by Solway. Now, I may say that there is required for the ammonia process very little more capital or rather a little less capital than there is for the Leblanc process. The amount of capital to produce 1 ton of soda by the ammonia process is $37; by the Leblanc process it is $40. The sulphate of ammonia which is the basis of operations in the Solway process is about 4 to 8 per cent. loss on the Soda Ash produced, and with care that can be reduced to 2½ per cent.

When Leblanc made soda from salt, one of the greatest troubles of the manufacturer got to be the expense of taking care of the so-called soda waste. If any of you have ever traveled over the railroad from Liverpool to Manchester, you well know what a delectable spot it is. This is due to the enormous quantities of soda waste (which is practically a sulphide of lime) which is exposed to the atmosphere and gives off sulphuretted hydrogen without any cessation.

Soda waste contains anywhere from 11 to 15 per cent. of sulphur and the total waste in the Lancashire district is 750,000 tons, that is equal to 100,000 tons of sulphur. It costs quite a little money to get rid of it, they not only require land to dump it, but it costs them 25 to 36 cents per ton to put it there. There is practically obtained about 1½ tons of the dry waste for every ton of soda ash made, and you can easily convert them into tons if you are interested; they call it waste because very little of it has been utilized. In the European works if they could remove the sulphur from the waste they would produce 180,000 tons of sulphur per annum, and England could produce 60,000 tons, if they utilized it. The utilization of this waste is becoming quite a subject of interest. One process consists in aerating it and turning the sulphide into a hyposulphite of calcium, and if you remember that hyposulphites give sulphur as a precipitate when treated with acids, you will understand the operation of this process; they say that about ⅓ of the sulphur in the waste is thus saved. Another process consists in treating the waste with air, then passing sulphurous acid into it; there are 14,000 tons of sulphur made this way, but in practical operations the more recent process still consists in turning part of it into sulphuretted hydrogen and part into sulphurous acid and making these act upon one another and deposit sulphur in that way. The sulphur recovered by another method is very interesting; at first sight it would appear that such a material as magnesium chloride would not act like an acid, yet if you treat soda waste with it, you get sulphuretted hydrogen and chloride of calcium, and your chloride of calcium is not lost but you can utilize it in making magnesium chloride again, and then by acting upon more waste get the sulphuretted hydrogen as in the first step of the process. Now, the chief points are: 1st, the magnesium chloride shall have a certain density; 2d, that the carbonic acid to decompose calcium chloride and magnesia formed in the first step shall be under pressure; and the third step is, that the sulphuretted hydrogen produced shall be kept unmixed with air, to aid in the economy of space. This last process is under trial, and bids fair to succeed.

The Solway soda process is a success only in the event of obtaining cheap ammonia. The obtaining of ammonia is an exceedingly important chemical operation.

As you all know sal ammoniac was brought from the East in the early part of the 16th century. There is not much known about it, except that it was made by the Arabs; a Jesuit priest believed it was made in the delta of the Nile.

There are several sources of ammonia in which it is found in small quantities, but there are also large quantities of the materials produced. A ton of coal will give about 70 lbs. of sulphate of ammonia, this is contained in about 30 gallons of gas liquor. Bones give 6 to 7 per cent.; when they are distilled they will give a liquor very much like that obtained from gas. But Vinasse, the still-bottoms from the beet alcohol, gives from 1 to 4 per cent. of ammonium sulphate. As an idea of the amount of this material available, if all the beet-sugar works in Germany would send it where it could be saved, it would yield 15,000 tons of ammonium sulphate per annum.

To give you an idea of the amount derived from coke, there are thirteen million tons of coal used in this country every year for making coke, and you could get 70,000,000 lbs. of sulphate of ammonium from it, that makes twenty-million dollars, and every pound of it is lost. I hear there are ten or twelve coke ovens being erected to save this sulphate of ammonium, and, I believe in New York State. The efforts made in Scotland to utilize the ammonia from the Shale has resulted in a saving of $220,000, and they have only applied the method to about half the works.

Incidental to the manufacture of soap, is the production of glycerin either by alkali or by some other method which we know as saponification. Now, as you already are aware, most of the fats are compounds of fatty acids with glycerin, and the result of saponificaton is to form a salt of the fatty acid or the acid itself, and the glycerin separates. In early times the production of soap was in the form of soft soap or potash soap, this was then mixed with salt, which had the effect of increasing the density of the vat and the soap at the same time was converted from soft soap into hard soap. The first Castile soap was made this way by the French at Marseilles. As a result of this work we get glycerin in the liquids that underlie the hard soap as it floats. If we mix fat with water and make it very hot we can decompose it into glycerin and fatty acid, the fatty acid will separate, and give us glycerin in the water while the fatty acid will float upon it. The method with alkali takes the glycerin into the alkaline solution, and for many years this glycerin was wasted but is now saved. I suppose you would be surprised to hear that in 1893 there were used for the manufacture of dynamite for blasting in the United States 8,000,000 lbs. of glycerin, and there were 16,000,000 lbs. imported for refining and for other uses.

I have a list of the uses of glycerin and I had no idea of the many things to which it can be applied until I collated them. It was used in gas meters at one time to some extent, to keep them from freezing, then it was used in the preservation of skins, the production of leather gloves, for vulcanizing India rubber, and all the various uses in the pharmacy which are familiar to you. The production of soap led to the use of various oils and among other things olive oil, and it was soon noticed that the seeds of the cotton plant gave an oil like that of the olive, but the first method of taking the oil out of the seeds was not a success. It was in Nashua, Mississippi, and the first one who introduced was Mr. Hamilton Couper, who used a wedge press. That was as long ago as 1834 that the idea was conceived of getting cottonseed oil out of the cotton seed.

To give an idea of quantities—15,000 tons of seeds will give you 15,000,000 lbs. of hulls and 10,000,000 lbs. of meal and 4,600,000 lbs. of oil. The meal is worth $88,000 ; the oil, $186,000 ; the lint, $18,000 ; and the total value of the seeds, without taking into consideration the 15,000,000 lbs. of hulls, is $293,353.

At the beginning of my talk I was speaking to you about phosphates in the use of modern methods of agriculture. The production of Bessemer steel in the United States was a matter of selection of the best iron ores of the country, and only those practically free from phosphorous could be used for the production of steel. This was due to the method of manufacture in using a certain lining in the furnaces, the so-called silicious lining. A gentleman by the name of Thomas, who was an enthusiastic student of chemistry, used a basic lining made of lime, and utilized all the iron ores. The best iron ores, free from phosphorous were only about one-tenth of all the iron ores in the country, and only these could be used for making steel.

(*To be Continued.*)

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NEW ELEMENTS.

MORE than a year ago K. J. Bayer reported that he had discovered a new element among the bye-products of red (French) Bauxite. The acid of the metal is a yellowish brown invisible body, which dissolves in water to form an intense gold-yellow solution and on neutralization with ammonia the color is changed to olive green. Many of the reactions were interesting. The spectrum of the new body gives characteristic violet, blue and green lines and it is suggested that Bayer has probably discovered one of the missing elements predicted by Mendeleéff in the nitrogen-phosphorous group. The reactions with reagents it is argued also point to a compound of two metals rather than a new element.

More recently attention has been called to a constituent of the atmosphere which has long been overlooked. In 1894 Lord Raleigh, in a paper read before the Royal Society "On an Anomaly encountered in Determinations of the Density of Nitrogen Gas," showed that nitrogen extracted from chemical compounds is about 0.5 per cent. lighter than "atmospheric nitrogen." When the discrepancy of weights was first encountered attempts were naturally made to explain it by contamination with well known impurities as Hydrogen or as due to the dissociation of nitrogen molecules N_2 into detached atoms. But careful experiments lasting for months demonstrated that "chemical nitrogen" had a density of 2.299 and that "atmospheric nitrogen" possessed a density of 2.310. They then tried the process of diffusion in order to determine if the "atmospheric nitrogen" was pure or a mixture of components of different densities and later they proved that the atmosphere contains a previously unknown gas.

What adds considerable interest to these experiments is the fact that in 1785 Cavendish in a paper on "Experiments on Air" calls attention to the fact that the residue left on the withdrawal of oxygen, water, and carbon dioxide from air is identical with the constituent of nitric acid. He moreover showed that phlogisticated air (nitrogen) as he termed it was not the sole residue after removal of the bodies above named and he had actually experimented by passing the electric spark through a mixture of "phlogisticated" and "dephlogisticated air," to see if there was anything which did not combine with "dephlogisticated air" as he had found "phlogisticated air" did. He did get an uncombinable portion in his wonderful investigation and concludes that if there is any part of the "phlogisticated air" which cannot be made into nitrous acid it is not more than $\frac{1}{120}$ part of the whole.

Prof. Wm. Ramsay and Lord Raleigh have further experimented during the past year and have succeeded in withdrawing nitrogen from air by means of red-hot magnesium. They passed "atmospheric nitrogen" backwards and forwards over red-hot magnesium from one large gas holder to another to obtain a considerable quantity of the heavier gas. In the course of ten days about 1,500 C. c. were collected and transferred gradually to a mercury gas holder, from which the gas was passed over soda-lime, $P_2 O_5$, magnesium at a red heat, copper oxide, soda-lime and $P_2 O_5$ into a second mercury gas holder. The volume was reduced to about 200 C. c. At this point the density was 19.09 and it was examined by means of the spectrum and though showing nitrogen bands, showed many other lines which were not recognizable as belonging to any known element. They have called this element *Argon* from *an*, without and *ergon*, energy. It has refused to combine with any known reagent.

The authors then proved by atmolysis that the new element was present in the air and they at once instituted rather laborious negative experiments and proved thereby that the new element is not derived from nitrogen from chemical sources. They then separated the new element on a large scale from 100 to 150 litres of atmospheric nitrogen and determined the density as compared with hydrogen by several methods and found 19.90 to be probably the figure. This might be fixed as the molecular weight, did not certain considerations had to the supposition that the molecule may be like mercury monatomic, which would make the molecular and therefore atomic weight double the density.

Wm. Crookes examined the spectrum of Argon as seen in a vacuum tube through which the electric spark was passed. Two lines are especially characteristic; they are less refrangible than the red lines of hydrogen or lithium and serve well to identify the gas in this way. Besides these red lines, a bright yellow line, more refrangible than the sodium line recurs as also five bright green lines besides a number of less intensity.

Argon is about 2½ times as soluble in water as nitrogen and possesses approximately the same solubility as oxygen. It is interesting to note that Dr. K. Olszewski of the University of Cracow worked with 300 C. c. of gas prepared by the authors and has obtained the critical temperature, boiling-point, freezing point, densities of the gas and liquid. In comparing the physical constants of argon with so-called permanent gases, *Argon* belongs to the so-called "permanent" gases and as regards difficulty in liquifying it, it occupies the fourth place, viz., between CO and O_2. Its behavior in liquifaction places it nearest to oxygen, but it differs entirely from oxygen in being solidifiable; as is well known, oxygen has not been made to assume a solid state. Its unexpectedly low critical temperature and boiling point seems to have some relation to its unexpectedly simple molecular constitution. For a fuller abstract of this interesting subject, the readers of THE ALUMNI JOURNAL are referred to *Chem. News*, Feb. 1, 1895, p. 51. This work of Raleigh and Ramsay has aroused considerable interest and while there seems to be some doubts as to the existence of this new element, still the character of the men and their well known painstaking labor in this and every line of research they have undertaken bids fair to mark this communication of theirs before the Royal Society as the most remarkable and interesting investigation for years. There is probably no subject so indissolubly connected with the history of chemistry as the earlier investigations on the composition of the atmosphere.

NEW LITERATURE.*

Bacteriology.

Mikrophotographischer Atlas der Bakterienkunde.—G. Itzerott und F. Niemann. Lex. 8. Leipzig: J. A. Barth.

This contains 21 plates, containing 126 microphotographs.

Manualetto per la Preparazione e l'Anilisi chimica del Materiale di Medicatura antisettica. E. Barbi. Siena.

Blood Serum Therapy and Antitoxins.—G. E. Krieger. Chicago: E. H. Cologrove.

Botany.

Grundriss der Botanik, mit bensonderer Berücksichtigung der landwirthschaftlichen Kulturpflanzen. Franz Koseschnik. Leipzig: K. Scholtze.

Flora Brasiliensis.—-E. F. Martins, A. W. Eichler et I. Urban. Enumeratio plantarum in Brasilia hactenus detectarum quas suis aliorumque botanicorum studiis descriptas et methodo naturali digestas, partim illustratas edd. Fasc. 117. Leipzig: F. Fleischer.

List of Pteridophyta and Spermatophyta growing without cultivation in Northeastern North America. Prepared by a committee of the Botanical Club, American Association for the Advancement of Science.

Chemistry.

Kurzes Repetitorium der Chemie zum Gebrauche für Mediciner, Pharmaceuten, Lehramtscandidaten, Chemiker, Landwirthe u. A. Gearbertet nach den Werken und Vorlesungen von Arnold, Bernthsen, Fischer, etc. 2. Aufl. von E. Boyk. I. Anorganische Chemie. Wien: M. Breitenstein.

Traité élémentaire de Chimie.—Métalloïdes. R. Engel. Paris: J. B. Balliére et fils.

An Elementary Course in Organic Pharmaceutical and Medical Chemistry.—F. J. Wulling. New York: J. Wiley & Sons.

Analytical Chemistry.

A Text-Book of Volumetric Analysis.—H. W. Schimps. New York: J. Wiley & Sons.

Analisi volumetrica applicati ai produtti commerciali, e industrialia. P. E. Alessandri. Milano: M. Hoepli.

Reactionen und Reagentien. K. Schneller. 2 Bd. Eichstätt: A. Stillkrauth.

Electro-Chemistry.

Electro-chemie.—Ihre Geschichte und Lehre. W. Ostwald. Leipzig: Veit u. Co.

Inorganic Chemistry.

A Treatise on Chemistry.—H. E. Roscoe and Schorlemmer. London and New York: Macmillan, Vol. I. Non-metallic Elements. New edition, completely revised by H. E. Roscoe, assisted by H. C. Coleman and A. Harden, with 374 illustrations and a portrait of Dalton.

Stereo-Chemistry.

Handbuch der Stereochemie.—C. A. Bischoff, unter Mitwirkung von P. Walden. 2 Band (Schluss). Frankfurt a M.: H. Bechhold.

Chemical-Technology.

Technisch-Chemisches Jahrbuch, 1893-1894.—R. Biedermann. An account of the progress in Chemical-Technology from April, 1893, to April, 1894. Berlin: C. Heymann.

Erdmann-Konigs' Grundriss der allgemeinen Waarenkunde unter Berücksichtigung der Technologie. 12 Aufl. Von ed. Hanansek. Leipzig: J. H. Barth (A. Weiner).

Pharmacy.

Handwörterbuch der Pharmacie.—Herausgegeben von A. Brestowski. 19 Lfg. Leipzig: W. Baumüller. This work is a collaboration by numerous writers, edited by Brestowski and intended for pharmacists, physicians and those interested in medicinal products.

Physics.

Preparatory Physics.—H. J. Hopkins. London and New York: Longmans, Green & Co. A short course in the laboratory.

List of the Chief Memoirs on the Physics of Matter.—R. A. Lehfeldt. Published under the direction of the Physical Society of London.

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* Readers desiring any of the works contained in this list can obtain them through B. Westerman & Co., 812 Broadway. Gustav E. Stechert, 810 Broadway, or other foreign booksellers.

Industrial Photometry.—A. Palaz. From the French by G. W. Patterson, Jr., and M. R. Patterson. New York: D. van Nostrand Co. With special application to electric lighting.

Handbuch der Physik.—A. Winkelmann. 3 Bd. 2. Abth. Breslau: Ed. Trewendt.

Leitfaden der Physik mit Einschluss der einfachsten Lehren der mathematischen Geographie nach der Lehr—und Prüfungsordnung von 1893 für Gymnasien. 1 Bd. 2. Aufl. Leipzig: S. Hirzel.

Photography.

Kalender für Photographie und verwandter Fächer pro 1895. C. F. Hoffmann. Wien: Moritz Perles.

Beiträge zur Kenntniss der photochemischen Wirkung in Lösungen.—M. Roloff. Inaug.—Dissert., Univ. Gottingen.

Therapeutics.

Warner's Therapeutic Reference Book.—Contains the following useful memoranda: Aid in memorizing doses, treatment of asphyxia, poisons and antidotes, posological table, prescription writing, weights and measures, incompatibles and information on many other similar subjects of use to the pharmacist and physician. Published by Wm. R. Warner & Co., 18 Liberty street, New York, and may be obtained by any of the subscribers of THE ALUMNI JOURNAL for 15 cents.

LITERATURE.

PHARMACOPŒIAS IN THE S. A. D. SHEPPARD LIBRARY OF THE MASSACHUSETTS COLLEGE OF PHARMACY.

(Continued from Dec., 1894, issue.)

HOLLAND.

Johannis Schroderi. Doct. Medici. minon reipublicae Maeno-Francofurtan. Physici ordinary. Pharmacopœia. 1665. (Latin.)

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THE MOST RECENT WORK.

Ipecac Root.—The Relative Alkaloidal Value of.—A. R. L. Dohme.

In order to more directly compare the various parts of "fancy" and "wiry" roots of Ipecac, the cortical envelope was removed from the central woody cylinder, above called "Woody Portion," and each assayed separately. The cortex was in each case scraped from the woody central cylinder by means of a knife and the woody cylinders closely examined so as to be certain that no particles of cortex still adhered to them. All were then ground to a No. 80 powder and assayed. The method of Mr. C. C. Keller, of Zurich, was used instead of Lyons' method which had been used last year. *See Proc. A. Ph. A.*, 1893. This was done for two reasons: first, because it gave better results, and second, because it was found to be more expeditious. The method of Keller is quite simple and is being applied by its author to all alkaloidal drugs. It consists in treating the drug directly with ether and chloroform, usually three parts of ether to one of chloroformby weight, shaking well for five minutes, then adding sufficient ammonia water and shaking well for half an hour. Then some water is added to clog the drug powder together and an aliquot part is poured off and at once treated with dilute acid in a separatory funnel. The acid solution is made alkaline with ammonia and extracted with ether chloroform, the chloroform usually in excess to facilitate separation. The extracting fluid is let into a small flask and the ether-chloroform distilled off on a water-bath. By adding a little ether and alcohol, the last portions of chloroform can be successfully removed on the water-bath. The residue, consisting of the alkaloids usually in a good state of purity, is then titrated with acid and alkali, using brazil wood or litmus as an indicator. The following results were obtained:

Cortex of "fancy" root yielded 1.68 per cent. of alkaloids by titration.

Cortex of "wiry" root yielded 3.15 per cent. of alkaloids by titration.

Woody portion of "fancy" root yielded 0.17 per cent. of alkaloids by titration.

Woody portion of "wiry" root yielded 0.50 per cent. of alkaloids by titration.

These roots were picked from the same sample of ipecac root, which contained both varieties in about equal quantity.

This verifies the results obtained last year and justifies the conclusion that the so-called "wiry" root, *i. e.*, the upper part of the root which free quently is in part a stem, contains more alkaloid than the lower or annulated part. The explanation of this fact is easily given. The cork cells and cortical parenchyma adjacent to them ar the seat of the alkaloids. A piece of "fancy" root weighs more than a piece of "wiry" root of the same size, because of the excess of starch in the former. It hence takes three pieces of the same length of "wiry" root to make up the same weight as two pieces of "fancy" root. The percentage of outer bark, *i. e.*, cork cells and adjoining cortical parenchyma is in consequence greater in case of the "wiry" than in case of the "fancy" root, which is only another way of saying that the percentage of alkaloids is greater in the former than in the latter. This also explains why so much more alkaloid was found in the comparative cortex assays in the "wiry" than in the "fancy" root; for given the same weight of both, there was more wood removed wh en the cortex was scraped from the woody cylinder in case of the "wiry" than in case of the "fancy" root, and it required all the more of the "wiry" cortex to make up this loss, since the percentage of wood in the "wiry" is about three times that in the "fancy" root. This is equivalent to an addition af alkaloid, since the cortex is the seat of the latter. –*A. Ph. A. Proc.*, 1894.

Preparation of Culture Media.—J. L. Smith (*Brit. Med. Jour.*, 1894, 1177) points out the difficulty bacteriologists have to contend with in the fact that the composition of many of the media used for cultivations of pathogenic microbes differs so widely from that of the blood and other fluids found in the animal tissues. He describes a method by which medica can be prepared directly from these fluids by a process which reduces the difficulties of manipulation to a minimum.

Break up the white of a hen's egg with an egg-beater till it loses its consistency; add 40 per cent. of water and mix well; pass the mixture through muslin to remove any shreds of insoluble material; add 0.1 per cent. of caustic soda, and solidify in the autoclave. With a little care in clearing it a jelly of egg-white can be obtained which closely resembles gelatin in consistency. Substances like glucose can be added if desired.

A large variety of bacteria have been found to grow on this medium with great readiness.

Aliphatic Acids of Lanolin.—By J. de Sauctis (*Gazzetta* 24, I, 14-28). Lanolin was treated with hot sodium ethoxide solution, and the sodium salts deposited were then extracted with ether to remove basic compounds. The acids not volatile in a current of steam were found to be cerotic, palmitic, normal caproic and oleic acids. Those volatile in a current of steam were stearic, isovaleric, and normal butyric acids. The acids were separated by means of their lead salts and anylized quantitatively.

Persea gratissima Gaert.—The distillation of 2 kilos of the leaves from Genoa yielded 0.5 per cent. of a pale greenish oil, showing the following constants: Sp. gr 0 9607, optical rotation $+1° 50'$ nD at $18.2° = 1.5164$. In odor and taste the oil almost exactly resembles *estragon oil.* It does not contain anethol. Its high Sp. gr. and its refractive index, taken in conjunction with its odor and taste indicated a fairly pure methylchavicol, a body which has been shown to be present in oils of estragon and anise bark. An attempt to convert a portion of the oil into anethol by means of caustic potash unfortunately miscarried through the bursting of the vessel employed in the operation. The small quantity of oil remaining was iodized with permanganate of potassium and an acid obtained melting at 183° and showing all of the properties of anisic acid. It is therefore probable that the principal constituent of the oil of the leaves of Persea gratissima Gärt is *methylchavicoe*, an isomer of anethol of a distince anise like odor Prof. Flückiger called the attention of Messrs. Schimmel & Co. to the anise like odor of the leaves of this plant. —*Schimmel's Report*, *Oct.* 1894, 69.

Pure d-Coniine.—By A. Ladenburg (*Ber. d. Chem. Ges.*, 27, 858-859). Pure coniine boils at 166-167° and has a specific rotation equal to $[a]_D = + 15.6°$. This number is identical with that given by Schiff (Ann. der Chem. 166,94), whichh as been mistaken by Landolt for the angle of rotation and used by him for the calculation of the specific rotation.

The platinochloride of this substance is completely soluble in a mixture of alcohol and ether. When its alcoholic or aqueous solution is evaporated, it solidifies at once on cooling, whereas the platinochloride of the impure material generally remains oily for some time.

Aq. Menth ?—J. H. Heaf revives the question as to what should be dispensed for Aqua Menthæ. It was the opinion of the members of the London Chemists' Assistants' Association that "aqua menthæ" should be added as a synonym for "aqua menthæ piperitæ."—*Brit. and Col. Drug.*, 1875, 130.

Pill Coatings.—The relative merits of the coatings were considered by H. Dyson, *Chem. and Drug.*, 1895, 210.

Sulphate of iron pills were taken, and the point of disintegration tested by ferricyanide of of potassium present in the water. Those coated with silver gave ppt. in 22 minutes; with sandarach in about 25 minutes; with tolu about the same as last; with "pearl" coating in an hour and a half; with gelatine in 1 minute, 10 secs. Gelatine was thus the best, and the author scouted the objection raised to it as a coating on the score of the heat used in making the coating. Pearl coating was bad, as the pills had to be made as hard as possible. He recommended a one in three solution of gelatine for the coating. Dyson's recommendation of gelatine-coated pills is not agreed with altogether. Cascara sagrada and aloes were mentioned as ingredients in a pill unsuited to gelatine coating, and his verdict on the effect of heat in making gelatine solution was challenged.

Pine Tar.—A. Renard finds (*Compt. rend.*, 1894, No. 25) that the proportion of guaiacol in the creosote of pine is intermediate between that of the beech and the oak.

Oil of Cananga.—A. Reichler (*Bull. Soc. Chem.; Chem. News*, 1895, 65). The density of this oil at 21° is 0.9058 and the index of refraction n = 1.49655. Its laevo-rotation $[a]_D = - 28.5°$. Its composition is C, 85.68; H, 11.81; O, 2 51. Oil of Cananga has a great resemblance to oil of ylang-ylang, but it is clearly distinguished from the latter by containing a much larger proportion of sesqui-terpene.

Tests in Urinalysis.—In a paper upon "Albuminaria in Nervous Diseases" (*Am. Jour. Med. Sci.*, Oct. 1894), prepared by L. C. Gray and A. Zimmerman we find the following useful summary of chemical methods employed in urinalysis:

MILLARD'S AND TANRET'S TESTS AS ALBUMIN REAGENTS.

Tanret's.

Potassium iodide	3.32	grammes.
Mercury bichloride	1.35	"
Acetic acid	20	c.c.
Distilled water	q. s. 100	"

Millard's.

Carbolic acid	fʒij.
Glac. acetic acid	ʒvij.
Solut. potassa	ʒxxij.

ALBUMIN. (*Serum albumin, serum or paraglobulin, nucleo-albumin from bile, mucin from bile, mucin from mucous membrane.*)

Clarifying.—To about one ounce of the urine add about 60 grains of powdered French chalk, shake together, pour upon a four-ply wetted paper filter; throw away the first portion of the filtrate; return the following portions until the urine passes perfectly clear. When the specimen is in an advanced state of mucus fermentation, in which the mucus is so minutely subdivided by the increased number of bacteria that it cannot be clarified by the above method, then the addition of caustic potassa or soda to strong alkaline reaction without heat, followed by filtration through a wetted double paper filter, will clarify it. It will be necessary to return the filtrate several times before it passes perfectly clear.

The filtered specimen is divided into three-quarter inch test tubes, filling them about one-third full. To the first add 15 drops of Tanret's test; to the second 15 drops of Millard's test; to the third 15 drops of acetic acid. The reaction should be acid in all the tubes. Heat the three tubes to the boiling point, and while the contents are hot hold them up to a good light, with a strip of black paper or card-board a short distance back of them, about half the way up to the level of the fluids, and note the results. Set aside for thirty minutes, and again heat to the boiling point and note the results a second time. It is important that this length of time elapse before noting the last result, as minute quantities of albumin require this length of time for complete precipitation. The results should be noted directly after heating to the boiling-point, as one of the reagents precipitates all the alkaloids, peptones, and ptomaïnes, the other only a few of them, the precipitates of these bodies being retained in solution while hot; consequently they do not interfere with the albumin reaction.

The tube to which the acetic acid has been added is best held between the tubes containing the other reagents, any change in reaction being more easily perceptible. The acetic acid is used n addition to the reagents to detect soluble and dissolved mucin, combined acids of oleoresins, combined fatty acids, and other bodies yielding precipitates in acid media. The albumin reagents all being used in acid media, form precipitates when such substances are present; thus the acetic acid prevents any errors which may otherwise arise.

If albumin be present there will be an increased cloudiness or precipitate in the tubes to which the Millard's and Tanret's tests have been added. When very faint traces are present the opalescence produced, being distributed throughout the liquid, is more easily perceptible than the results obtained by applying the zone or contact test; the reagents being free from color, and the urine also deprived of considerable coloring matter by filtration through the French chalk, gives greater delicacy to the reaction.

When the specimen is acid and the reaction by Millard's test is more decided than that by Tanret's and acetic acid, being least by Tanret's, it shows the presence of mucin from bile and the nucleo-albumin from bile. This mucin appears to be the only soluble form of mucin found in acid urine, and with and with it is always to be found the nucleo albumin. the mucin from the mucous membrane being soluble only in alkaline urine. The reason that Millard's test gives this increased reaction is that it is a more delicate reagent for mucin than either acetic acid or Tanret's test.

When the reaction is more decided in the tube containing the acetic acid than it is in the tubes to which the Tanret's and Millard's tests been added, and no foreign bodies are precipitable by acetic acid, it shows the presence of serum or para-globulin.

When albumin serum alone is present, the reaction is indicated in the tubes contanining the Millard's and Tanret's tests, acetic acid giving no reaction unless mucin be present, as in alkaline urine or in specimens which have been treated with alkali for clarification, when the source is the mucous membrane, or in acid specimens when it is derived from the bile. When mucin is present in solution from either source the Millard's test always gives more increased reaction than the Tanret's test or acetic acid, being much more decided in the tubes containing the acetic acid and the Millard's test.

When any of the other forms of albumin are present with the serum albumin, the specimen is best treated with one-fourth its volume of glacial acetic acid, heated to boiling, set aside for one hour, then filtered through French chalk as above directed. This separates mucin from bile and mucous membrane, serum-globulin, and foreign substances, there being retained in solution serum-albumin and the nucleo-albumin from bile, and these may readily be differentiated by adding ferrocyanide of potassa to the acetic acid solution, without applying heat; the ferrocyanide being a more delicate reagent for the nucleo-albumin than either Tanret's or Millard's tests, yields a heavier reaction.

Sugar.

Water, 1 drachm; copper solution, 10 drops; alkaline tartrate, 10 drops; heat to boiling, continue to heat for one minute; if no change has taken place it shows the solution to be reliable. Add now 10 drops of the urine, heat again to boiling, continue the heating for one minute; set aside for ten minutes; if no reaction by separating suboxide of copper, it shows the sugar to be present below 0.10 per cent.

To show the presence of less than 0.10 per cent. sugar in urine, it is necessary to use the indigo-carmine test, consisting of two separate solutions; a 0.2 per cent. solution of sodium indigo sulphate in acidulated distilled water in the one, and the other a 25 per cent. aqueous solution of crystallized sodium carbonate, used by adding 5 drops of the sodium-indigo sulphate solution to a drachm of the sodium carbonate solution, heat to boiling, when the solution will acquire a green color. Add now 10 drops of the urine, heat again to boiling, and keep the fluid as near this temperature as possible without ebullition for one minute, by holding the tube in the flame withdrawing and successively replacing it at short intervals. If sugar is present, the color will pass from green to violet, purple, red, and finally straw-color, which remains without further change in color, the latter color being the indication for the presence of sugar. By shaking the tube to admit oxygen of the air and cool the fluid, the colors will return in the inverse order to that which they appeared. By this method urine containing 0.10 per cent. sugar will change the test to a red, while 0.02 per cent. changes it slowly to the straw-color the greater the proportion of sugar the more rapid will be the change to yellow, and from the degree of rapidity with which this change in color takes place, the proportion of sugar may be approximately estimated.

Uric Acid.

Taking 0.01 per cent. as normal standard.

To a definite portion of the filtrate from the phosphate test, add a concentrated solution of nitrate of silver until the mixture becomes deep gray or black, set aside for fifteen minutes; add half a volume of stronger water of ammonia, set aside, allow precipitate to subside, and pour off as much of the clear liquid as possible; again add an equal volume of stronger water of ammonia to the residue mixture; set aside for half an hour and note bulk of the precipitate and compare it with a standard volume or bulk obtained as an average from several specimens containing the above amount.

The uric acid is precipitated as silver urate.

If urates or free uric acid have separated as a precipitate, they are re dissolved by adding a slight excess of solution of caustic soda to the specimen previously well shaken, diluting with half a volume of water, making neutral with dilute nitric acid; then proceed to precipitate the phosphoric acid as directed under phosphates. Keep the volume of the fluid double that of the urine.

Meat diet very acid by acid phosphates crystallizes uric acid and retains the oxalate of calcium in solution.

Carbohydrate diet, faint acid by acid phosphates, sometimes alkaline by alkaline phosphates crystallizes oxalate calcium and retains uric acid in solution.

The acidity of the urine is reduced by the acid fermentation (lactic and butyric) of the carbohydrates, forming lactates and butyrates, which like citrates and acetates when administered, reduce the acidity of the urine. And these acids (lactic and butyric), like some of the constituents of meat under impaired oxidation, instead of being oxidized to carbonic acid as they are normally, yield intermediate products of oxidation, as oxalic acid for example.

With few exceptions, as the proportion of uric acid increases, the indican reaction becomes more intense.

Indican.

Jaffe's Test.

To concentrated hydrochloric acid (ʒj) add a minute quantity of chlorinated lime; then add one-quarter of the volume of the urine; if the chlorinated lime is added to excess the color will be destroyed, if not in sufficient quantity the reaction will be faint. With few exceptions, the indican is increased as the uric acid rises in proportion.

Urobilin.

100 c.c. of urine, shaken with 50 c.c. ether, the ether separated, evaporated without heat, the residue dissolved in alcohol and examined by micro-spectroscope.

Oxalate Calcium.

Taking 0.005 per cent. as a normal standard.

100 to 200 c.c. of the urine previously well shaken, add from 5 to 10 c.c. of a 25 per cent. solution of calcium chloride, add ammonia to alkaline reaction, shake well, neutralize by acetic acid, set aside for twenty-four hours; separate precipitate by filtration, wash with water, wash with hot solution of soda, then again with water, until the filtrate shows no perceptiple reduction with permanganate of potassium; allow to drain, dissolve the residue in dilute sulphuric acid, washing the filter carefully with the dilute acid, heat the filtrate to near boiling-point, and titrate with $\frac{1}{10}$ permanganate; each, c.c.=0.0054 calcium oxalate.

Bile.

Huppert's Method.

To 2 ounces of urine add about 2 drachms of milk of lime—shake well—separate precipitate by filtration, transfer to test-tube, add alcohol and concentrated sulphuric acid; upon heating, the alcohol acquires a green-yellow color.

Phosphates.

Taking 0.20 per cent. as a normal standard.

Dilute the urine with an equal volume of water; to one-half ounce of the mixture add two drops of a 25 per cent. solution of magnesium sulphate, then four drops of stronger water of ammonia; shake well, then set aside for half an hour, note bulk of the precipitate, and compare it with a standard volume or bulk obtained as an average from several specimens containing the above proportion.

The phosphoric acid is precipitated as ammonio-magnesium phosphate.

If a portion of the phosphates have separated from solution in alkaline specimens, they should be re-dissolved in nitric acid, then made neutral by caustic soda, before proceeding as above.

Urea.

Estimated by the hypobromite method in a nitrometer.

Solutions.

Potassium bromide	. .	125 grammes.
Bromine .	. . . . .	125 "
Water sufficient to make	.	1000 c.c.
Caustic soda .	. . . .	250 grammes.
Water sufficient to make	.	1000 c.c.

Used by mixing equal volumes.

The accompanying table is calculated from the quantity of urea, taking 400 to 500 grains daily as a normal standard.

The Relation of Urea to Specific Gravity.

Sp. grav.	% Urea.	Spec. grav.	% Urea.
1.010	1.00	1.024	1.95
1.012	1.20	1.025	2.00
1.014	1.35	1.026	2.05
1.016	1.50	1.027	2.10
1.018	1.65	1.028	2.15
1.020	1.75	1.029	2.20
1.022	1.85	1.030	2.25
1.023	1.90		

Quantity of urine for twenty-four hours, 90 to 48 fluid-ounces, taking 400 to 500 grains as the normal daily quantity.

Quinine Solvents.—The inconvenience and possible objection to adding sulphuric acid to quinine sulphate, for use in aqueous solution, is noted by Crousel in *L'Union Pharmaceutique*, 1894, who has found a substitute for the acid in tartaric and citric acids, which are already used for preparing solutions of mercuric chloride for subcutaneous injection. These acids agree better with the digestive fluids; they are, besides, habitually ingested in the form of fermented beverages (wine, cider). They thus constitute eligible solvents of quinine salts, and even of most other alkaloids that are but little or not at all soluble in neutral liquids; and they will be of special advantage, it is maintained, in hypodermatic injections, owing to their very feeble action on the constituents of the blood. The proportions necessary to render 0.5 Gm. of quinine sulphate soluble in 60 Gm. of distilled water are: tartaric acid, 10 Cgm.; citric acid, 30 Cgm.

A case is reported in the *Indian Medical Reporter*, in which a Hindoo woman took 10 grains of strychnine hydrochlorate as a poison. Her stomach was vigorously washed out with solution of permanganate of potash and repeated injections of chloral and potassium bromide were given per rectum. She recovered, having taken 220 grains of chloral and 240 grains of the bromide.—*Brit. and Col. Drug.*

OBITUARY.

FRIEDRICH AUGUST FLÜCKIGER.

BY EDWARD SCHAER.

The death on December 11, at Berne, at the age of 66, of Dr. Friedrich August Flückiger—an Emeritus Professor of the University of Strasburg and one of the honorary members of the Society—is an event which will produce throughout the entire world, in pharmaceutical circles where science is valued, the deepest regret and the greatest sympathy. Since there is no doubt that at a subsequent period a complete biography of this prominent authority and investigator will be published in some German journal, only a short sketch of his life and partial recognition of his scientific achievements will be attempted on the present occasion.

F. A. Flückiger was born on May 15, 1828, at Langenthal, a small village in the Canton of Berne. The son of a merchant, he received an education partly in his native country, partly in Berlin, at a commercial institute very celebrated at that time, and he was intended for a pharmaceutical career. He passed through the whole pharmaceutical curriculum, having been placed as a pupil, in the year 1847, with an apotheker in Solothurn. He was then engaged for a short time in France, Germany and Switzerland, as an assistant, concluding his pharmaceutical studies in the year 1851–52 at Heidelburg, where, in the position of chemical assistant to Professor Delffs, he obtained the degree of Doctor of Philosophy by means of a dissertation upon the fluorine compounds of antimony, which was distinguished by the care and precision of the work.

In the following year he worked in Paris with the well-known chemist, Wurtz, and after adding to his knowledge in London, began, in 1853, his career as a practical apotheker and part proprietor of a pharmacy in the small town of Burgdorf, near Berne. There he prosecuted his occupation until 1860, together with incidental scientific and literary studies, and then took the position of manager of the State pharmacy in the town of Berne, to which place he transferred his residence. He occupied this position—with which several other officials (for instance, the members of the Sanitary College and the Pharmaceutical Examiners), were connected, and at the same time that of forensic chemist to the Canton of Berne, until 1873.

A year after taking this new position in Berne he began to give public lectures on pharmaceutical subjects, especially pharmacognosy, as tutor at the University of Berne, and in 1870 he was elected extraordinary professor in recognition of his academic activity.

In 1873 he accepted the very complimentary invitation to take the professorship of pharmacy and directorship of the pharmaceutical institute at the newly established University of Strasburg, where he continued for nearly twenty years as an ornament of its mathematical and natural science faculty, and where his death is now lamented as a great loss. With the greatest success and indefatigable loyalty he continued his labors as teacher, investigator and author until 1892, when, at the age of sixty-four, he resigned, with the object of spending the evening of his life in the undisturbed quiet of literary work in the chief town of his native canton, after having devoted the best years of his life to the academic representation and promotion of his calling.

At the invitation of a friend he visited New York during this year, returning from there with many pleasant and instructive recollections at the commencement of October. Very soon afterwards indications of a complaint, which had no doubt long been latent, manifested themselves and in a very short time terminated his life.

Flückiger's scientific achievements and merits cannot of course be sufficiently acknowledged in a short sketch of his life, but only mentioned in a cursory manner. Indefatigable industry in scientific investigations was a characteristic of his work, assisted as it was by remarkable powers of memory and an astonishing acquaintance with all departments of literature relating to pharmaceutical and natural science. This is the key to an almost astonishing many-sidedness which enabled him without the least danger of superficiality to carry out important work in all departments of his calling and in almost equal degree to cultivate pharmacognosy, pharmaceutical chemistry and the history of chemistry and of drugs, with such success that, independently of his larger writings, upwards of 300 memoirs have been contributed by him to pharmaceutical literature on those subjects.

For a powerful stimulus in promoting his scientific calling he was, no doubt, indebted to his intimate participation in the construction of the first Pharmacopœia Helvetica while residing at Burgdorf. This he had to carry out as President of the Swiss Apotheker-Verein from 1857 to 1866. He was also engaged as chief editor of the second edition of the Pharmacopœia Helvetica, 1872. The preliminary work, experiments, observations and literary studies necessary for this purpose may be regarded as the basis of his "Lehrbuch der Pharmakognosie des Pflanzenreiches," carried out in Berne, the first edition of which was published in 1867 by Gaertner, at Berlin, and acquired for him at once a universal reputation and well earned recognition. That work, the second and third editions of which appeared in 1883 and 1891, founded a new epoch in the science and study of pharmacognosy, one of the most eminent representatives of which Flückiger was generally acknowledged to be.

Of still greater interest to all English-speaking pharmacists was "Pharmacographia," published in 1875 conjointly with Daniel Hanbury. In conjunction with that distinguished representative of English pharmacy Flückiger continued for many years a joint work, which led to the production of a book which is not only generally valued throughout England and America, but was also of importance in regard to all the subsequent publications by Flückiger upon the subject of pharmacognosy. After the death of Hanbury in 1878 the second edition, revised by Flückiger, was published by Macmillan. During the same year appeared the first edition of his "Pharmaceutical Chemistry," which treated in a masterly monographic manner of the more important pharmaceutical chemicals, and contained an abundance of original observations by himself. The second edition of this work was published in 1888. As supplementary to his "Lehrbuch der Pharmakognosie," Flückiger published in 1873 the "Grundlagen der pharmaceutischen Waarenkunde," of which a second edition appeared, in which Professor Tschirch assisted, and where the anatomical botanical relations indispensable to the study of pharmacognosy were treated of. Since the relatively large extent of Flückiger's "Pharmakognosie" rendered that work less suitable for the use of students, he reproduced its quintessence in a more compact form as a small handbook, the "Grundriss der Pharmakognosie," which was intended for use by students attending lectures. This book. which soon became popular throughout German-speaking countries, was published in 1884, and in 1892 a second edition appeared, not long before the death of the author.

One of the last literary productions of this pharmaceutical author was the work entitled "Reactions," published in 1892, in which the chief chemical reactions of the more important organic substances used in medicine and pharmacy are described, and an inconceivably large number of original observations by the author are recorded. This was in part a fruit of his labors as member of the Pharmacopœia Committee of the German Empire. Passing over Flückiger's historical writings, it may be mentioned that he proved himself a master of style in numerous essays, accounts of travels, and other literary productions. His way of writing made all his productions in the highest degree attractive.

In concluding this brief notice, it may be said that Flückiger gave evidence of a combination of unusual natural faculties, with a great store of carefully acquired knowledge and untiring industry, giving rise to unique literary productions. No one can be compared with him or any one placed before him as having contributed so largely to scientific pharmacy. Switzerland, his native land, will long continue to include him among her most eminent scientific men. Honor to his memory.—*Pharm. Jour. Trans.*, 1894, 538.

A New Subject for a Degree Examination. —The *Unio Médicate* states that the Tailors' Union of Gratz, in Styria, has addressed to the rector magnificus of the University a request that in future no student shall be accorded the diploma of doctor unless he can show evidence that he has paid his tailor entirely.—*Brit. and Col. Drug.*

FERROPYRIN.—This is an orange red powder, a compound of ferric chloride and antipyrin. Its composition is $F_2Cl_63(C_{11}H_{12}N_2O)$. It is easily soluble in cold water. It is given in doses of 7 grains in febrile ailments.

THE COLLEGE OF PHARMACY OF THE CITY OF NEW YORK.*

BY PROF. H. H. RUSBY, M. D.

Following out the idea of the division of labor presented in our opening paragraphs, we find the present duties of the pharmacist to be as follows, omitting the extra-professional, or so-called commercial, side of his business, and also that portion, now in its infancy, which is very vaguely spoken of as "advanced pharmacy: (1.) To obtain the crude materials from which his medicinal preparations are to be manufactured; (2) to make a judicious selection from among such materials, or to make similar selection from among such preparations as are offered to him by manufacturers; (3) to properly preserve and store such materials and preparations until required; (4) to interpret the directions of the physician as expressed in prescriptions; (5) to correct the physician's mistakes so presented; (6) to carry out those instructions; (7) to take professional action in emergencies, the most extreme cases being those in which he is compelled to fill the place of the physician in grave cases, where no physician is to be had. The primary but not the sole object of the College of Pharmacy is to fit the student for performing these seven duties.

Most of the professional work of the pharmacist is directed and limited by an official guide known as the "United States Pharmacopœia." This book is decennially revised by a large committee of pharmacists and physicians, appointed for this purpose by a national convention of delegates from our colleges, principal societies, and certain other bodies of pharmacy and medicine. It fixes the official titles and recognized synonyms, defines the identity, gives descriptions for identification and selection of *materia medica*, and directions for making such articles and preparations as the pharmacist is supposed to make for himself. The articles thus treated in the Pharmacopœia are known in the profession and in the law as "official." The work does not assume, except in the form of some of the more important reference-tables, to give scientific instruction. This the student is expected to gain at the school of pharmacy.

It will thus be seen that the pharmacy school has its field of labor well marked out for it by the carefully framed directions of the entire medical fraternity of the nation. The honesty and faithfulness with which this work is performed by the different schools varies from almost zero to a high degree of perfection. Unfortunately, however, the graduates of all schools stand in the eye of the law, and too often in the estimation of the public and a great part of the medical profession, practically upon one level.

Of the articles of the official *materia medica* 175 consists of plants or parts of plants, in which latter are not here included the 139 substances extracted from plants—while 207 are substances of inorganic origin. Articles of the third, and many of those of the second class, are obtained from manufacturers of chemicals. The natural effects of our tariff system is to enable the home manufacturer to offer pecuniary temptations to the pharmacist to content himself with an inferior article, thus largely depriving the former of the stimulus of competition as to quality, because the most of such stimulus, as relates to this class of articles, originates abroad. This is apparently one reason why foreign chemicals are in general superior to those of domestic make. But among both there is considerable variation as to purity. It will thus be seen that the pharmacist requires a very extensive, accurate, and practical knowledge of chemistry and closely related physics, of which he is required to make constant use in testing purity and quality.

(To be continued.)

*From the Univ. Magazine.

College Notes.

'94 NOTES.

'TWAS indeed a pleasure to again listen to a lecture from Prof. Elliott, particularly when such an interesting subject as Chemistry in the Utilization of Waste Materials was chosen. His familiarity on this subject enabled him to discuss it to some length with compaiative ease, he detailed explanation of the utilization of soda waste was surprising as well as interesting. The mention of the Glassboro, N. J., glass works as the first of their kind in this country was undoubtedly an intentional tribute to Jersey, in fact the Doctor always seemed to take pleasure in casting aside those notorious mosquito stories and revealing the Empire's sister State in a true light. The poem in his finalé was exceptionally good and well merited the applause it received at the hands of an enthusiastic audience.

THE presence of ex-Pres. Ehrgott, ex-Sec'y Wurthman, Messrs. Bastedo, Clarke, Krueder, Herold, Burgher, Auerbach and Geisler invoked a compliment to our class by Pres. Graeser, who said their presence and fidelity to our Alma Mater was an excellent example to the undergraduates.

MR. ALFRED H. MASON, Chairman of the New York section of the Society of Chemical Industry, to whom the success of our Seabury & Johnson excursion was mainly due, was among Dr. Elliott's interested audience.

I WOULD not be surprised to learn that the "monologue artist" of this class was suffering from a cold, for after the lecture and during our short sojourn in an adjacent Teutonic café where culmbacher was on draught, George Burgher persisted in sitting in the draft (draught).

ANOTHER '94 man has "gone to law" after serving many (happy?) years in the retail trade. He has decided to cast his lot with the legal profession. I refer to Herold, our only Junior successful in beard raising. Hieronious has joined the Alumni Association, as has also Frolich and Geisler.

I HAVE to note a new departure. Geo. C. Frolich, our genial classmate from "The Land of the Midnight Sun," and incidentally the proprietor of a flourishing pharmacy in Mamaroneck, N. Y., has forsaken his bachelorhood to assume the role of a Benedict. To our fortunate brother a liberal amount of '94's good wishes are extended, reserving of course q. s. for emergencies, as at very short notice there may be "others."

JOHN D. CASE, the defeated candidate for Secretary in the '93-'94 campaign and subsequently one of our most popular men, is located at Sommerville, N. J.

GEO. W. SIMRELL is practicing the profession at Fort Hamilton, N. Y. Notwithstanding the long journey George has promised Race to attend the next lecture.

I SAW Otto Maryx a short time ago during his visit to this city. He is no longer in New Haven, having recently accepted a position in Derby, Conn., with S. W. Smith & Co.

A GENTLE REMINDER,—The Alumni Association extends to you an invitation to attend Dr. Pellew's lecture on the History of Poisons, to be delivered Wednesday evening, March 13. A synopsis of interesting cases of the last decade will probably be given.

NELSON S. KIRK, Ph. G.

9 E. 59th St.

Senior Class Notes.

THE excursion to Johnson & Johnson turned out to be a great success

From the departure of the ferry boat to the return of the excursionists, it proved to be a day of triumph and pleasure long to be remembered by the class of '95.

A goodly number of the boys met at No. 129 West Fifteenth street, and went in a body to the elevated station on 14th street, where, luckily, they found a car two-thirds empty, which they immediatedly appropriated to their own use. Harding and Davis were favored by finding seats beside a young lady of prepossessing appearance, and tried to outdo each other in their attentions upon her.

During the above episode, Ferguson tried to appropriate a 77 style derby to himself, which he found tangled up in one of the car lamps, but was baffled by the timely arrival of the train guard, who threatened to obstruct his vision, and otherwise disarrange his facial expression if he interfered with it again, which he did not. What use our vice-president intended to make of this very interesting article is not known, but it is surmised that he intended using it on his farm at Little Falls as a scarecrow.

The ethyl, methyl and so forth, which rung out at short intervals in the car, seemed to paralize the nerves of the other occupants, one of whom was heard to remark as the boys left the car: "If they own this train, its d—— n poor property."

The boys presented a fine appearance with pennants, flying as they marched down Cortlandt street to the ferry, being the object of much attention from the many hundreds of pedestrians. who hourly throng this busy thoroughfare.

At the ferry, their ranks were swelled by many others, among whom were Quiz Master Madison. Leaving here at 9 A. M. the trip across the river was soon made, and in the special car provided for that purpose, the class of '95 was soon bowling towards New Brunswick. The many songs and jests that were rendered by Messrs. Kerr, Zeh, Chambers, Brencke and others, shortened the journey so that New Brunswick was reached before many of them realized it.

They were met by Mr. Jas. Rogers, and escorted by him to the factory, where after passing through the office, they began the rounds of this most interesting establishment.

Many of the boys were loath to leave the office, being contented to stay there and exchange smiles with the pretty typewriter.

The shipping room was first visited, and the number of employees with the amount of goods in the process of packing, gave us an idea of the enormity of the institution.

The plaster room, where the gums are ground, cleaned, mixed and spread, was inspected very closely by the students, (the female operators most, the male operators less, and the plasters least).

It is said that this firm can make 15,000 plasters per day, or 5,000,000 per year, somewhat faster than the boys in the laboratory, whose finished products resemble the rolling prairie of the West.

The cotton room was next visited with its mechanical arrangements for bleaching, boiling and dying.

The automatic machines where the cotton is started and kept moving until the product is ready for use, were inspected very closely by the boys.

We were told that it took the product of 15 to 20 acres of a cotton plantation to supply this factory for a single day. they consuming 4,000 pounds per day, or 1,500,000 pounds per year.

The number of acres of rye necessary to quench the thirst of the excursionists has not as yet been estimated.

About this time it was noticed that Messrs. Kerr and Zeh were absent. A hasty search revealed the fact that they were singing love songs on the floor below, surrounded by the ladies of that department.

Shortly after Ferguson was coming down stairs and thinking the inspection of the works was completed, was heard to make the following remark: "Is this all we have seen."

Miss Werner's room with its many pretty lady operators was next visited. It was here noticed that they had a flag of the class hanging up and wore our class colors.

The gauzes and plasters were lost sight of entirely in this room, nothing but the girls were considered. Lavalaye, Sherman, Morse, Gifford and Ferguson were only prevailed upon to leave by the entreaty of Superintendent Ritter, and it was only justice for him to state that this was one of his busy days.

His duty seemed to be to keep the line of procession entire, but the deserters from the line in the female department particularly tried him to his utmost. The antiseptic department came next and was viewed with unusual interest, as were also Miss Denman's and the printing department.

It was here that Lavalaye and Gifford by a liberal use of the firm's labels succeeded in disguising themselves. It would be a careful observer who could find evidence enough from their appearance on that day, to connect them with anyone of the five branches of the human family.

Darwin would himself despair
Bite his tongue and tear his hair,
Before he could consistently
Place them in Chiko's Family.

The box room was next visited where the thousands of boxes used by the firm are manufactured. The quickness of some of the lady operators in this department was marvelous.

If they could show the same capacity for house work, they surely will make excellent wives, (that is unless they made their boxing ability tell against their husbands).

The felt and isinglass plaster room was next inspected, and lastly, the chemical laboratory, where are made the Papoid and Kola preparations, which are well known to the pharmacist.

The tour of the works being now complete, the class was taken to the Mansion House, where as guests of the Johnson & Johnson Co., they were served with an inviting spread, including Vina Kolofla of the firm's own manufacture.

Toasts were offered by Messrs. J. W. Johnson, James Rogers, F. B. Kilmer, W. H. Ritter and A. J. Stephens on bel alf of the Johnson & Johnson Co., and were responded to by Prof. Coblentz, Quiz Master Madison, and Messrs. Bailey, Chambers, Kerr, Ferguson, Zeh, Lavalaye, Gies, Crooks and Bannon on behalf of the college.

There was also singing by the class, all combining to make the day one of that will remain engraved upon our memory for many years.

With a few hours to spare, the boys under the guidance of Mr. Ayres, took in about all the objects of interests in the city, including the handsome gymnasium of Rutgers college.

The high school was viewed, and as soon as the ladies were sighted, the boys would line up single file, and salute them as they passed.

Occasional stops were made to enable the fatigued to brace up on soda water and hot lemonade, and the march resumed.

Train time drawing near, everyone moved toward the depot (or was helped), and soon were being whisked along in the direction of New York.

As a climax, a theatre party of 30 or 40 was quickly formed, and seats for the "Twentieth Century Girl" contracted for by telegraph.

The play proved to be something of a disappointment, and they were all thankful after the performance that they were living in the Nineteenth century.

Then boys for J. and J. a cheer,
In competition they have no fear;
Their goods are known to be the peer,
And their employees to us very dear.

A VISIT TO MESSRS. E. R. SQUIBBS & SON.

Another interesting visit by the class of '95 was made to Messrs. E. R. Squibbs & Son's manufactory, on Dougherty street, Brooklyn, on Friday, February 15, 1895. In addition to the large number of hilarious boys present, Miss Mahony and Miss ———— honored us with their presence. This was more than they did for us on our visit to J. & J's. A party of the boys made a tour of search for belated members and found Ogden lost in one of the side doors—I mean side streets of Brooklyn. On their return they were received in the spacious court by Quiz Master Madison, and in squads they were shown through the labyrinth of departments of Dr. Squibb's establishment, and models of neatness they are too.

Here was the preparation of methyl acetate, he new and very cheap solvent; there the preparation of extract of ergot; here, the dark solution which finally would yield for us our pure white potassii et sodii tartras; there, the perfection of absolute alcohol; here, the great block-tin-lined tanks containing concentrated solutions of potassii chloras and ammonii chloridium; then the preparation of the bismuths next claimed our attention. We saw the argols of the wine casks, but missed the wine. The carbonate of ammonia separated from its carbonate by the circular saw was a novel sight, and the girls who bottled it received not a small share of our attention.

But by far the most attractive spot, at least, for Lavalaye, Zeh, Gifford, Manville and some others,

"Was at the lair,
Where tenderly smiled
Two maidens fair,
Their time beguiled."

In fact, I know not which was the more interesting, the sealing of the cases of ether, or the maidens faces? I saw the boys watching the one almost as much as the other; the faces predominating. But, alas! we had to leave them.

"A vison of the past,
Too sweet to last."

The march from the manufactory across the bridge was a matter of much concern for the Brooklyn Police, but the way they were saluted made them swell with pride, and chased the shadows of anxiety away to make room for those of smiles. How easily one's vanity is tickled! When Hegeman's store was reached, he was given a rousing reception, as was also Atwood's. Then a wild rush was made for Dennett's, whose walls echoed to the cry of, "Iso-Neo-Paraffin, Morphine, Codeine, Narceine, Ethyl, Methyl, Aldehyde, N. Y. C. P. '95"

A neat march was stolen on the management of Keith's Fourteenth street theatre. In groups of three and at intervals of half a block apart, the whole party gained entrance to the theatre, and to the suprise of the liveried attendants, their presence soon became apparent. This too, was left in time to be present at Dr. Elliott's lecture.

Miss Mahony and her kind friend did not accompany the boys in their protracted march, neither did Prof. Coblentz nor Mr. Madison, but no significance is to be attached to this.

INGESTOL is the name given a remedy which is recommended in acute and chronic complaints of the stomach and intestines and in seasickness. It is a slightly opalescent, light citron yellow aqueous solution which is said to contain the sulphates of magnesium, sodium and potassium, sodium chloride, alcohol, ether and iron.

NOTES.

BROWN on anthelmintic.—A medicine designed to obviate the growth of parasitical organisms.

COMMITTEE on valedictorian reported on the following names:—Chambers, Gies, Kerr, Zeh, Manville, Murray, Sharnikow, Wells, Vanderbeek, Smith and Bjorkwall.

THE committee having in charge the revision of the constitution made their report and it was accepted with a few changes.

MORSE received a letter postmarked New Brunswick, and signed by May. So much for the excursion.

THE report of Mr. Gies, as chairman of the flag committee, was accepted, and the committee discharged with thanks.

LET'S get to work, boys, and stop antagonizing each other. We are all working for the same object, namely, the glory of the class.

A DESIGN, submitted by Mr. Coles, was accepted as the class pin for '95. It was the work of Mr. Braxmar, of Cortlandt street.

LET us hope that in addition to class valedictorians we will have a class prophet, historian and poet. Other colleges of pharmacy have—why not we?

SINCE the excursion Joe looks blue,
Kerr has a sad look on his face too.
Gus says I am married, it affected me not,
While Ferguson says I feel bad a lot.

Wells pretended to just watch them work.
Keep your eye on this youth, he's as sly as a turk.
Davis is quiet and don't make much noise,
But when he gets out he is one of the boys!

Hilliard of Jersey, of fly-speck fame,
And his companion, Fred Sherman by name,
Took in the sights of the fair Jersey town,
As also did our whiskered friend, Mr. Brown.

Steinbroar was there, and his neighbors declare
That his end of the table was cleaned off for fair.
Fleck was there, and the girls all agree
That he is slicker than goose grease in Jaunary.

Zeh was there, as the records all show—
No, not the police records, fellow-students, ah, no!
Some fair one on Will made an impression deep,
As he talks of her lovingly while he is asleep.

CLASS REPORTERS.

AT a meeting held Wednesday, February 6, '95, the following business was transacted—J. I. Bailey, President, in the chair:

Revision of Constitution—Moved, seconded and carried, that a committee of four be appointed to revise the Constitution. . . . That they provide in this for the appointment of an Executive Committee, to be made up equally from members of Sections 1 and 2, and that the duties of this committee be clearly defined.

G. E. MANVILLE, Sec. 1.
D. E. BROWN, "
J. B. CARTER, Sec. 2.
C. C. HEFFLEY, "
Committee.

Class Pin—Moved, seconded and carried that in addition to the original design selected two new ones be exhibited; that they be numbered respectively 1, 2 and 3.

After exhibition to the class designs were voted on, resulting in the choice of No. 2.

Following gentlemen were chosen to obtain estimates for manufacture:

B. A. GIFFORD,
F. S. MOORE,
H. E. COOLEY,
Committee.

Class Cry—Moved, seconded and carried that an additional Class Cry by adopted as follows:

Iso-Neo-Paraffine,
Morphine-Codeine-Narceine,
Methyl-Ethyl-Aldehyde,
N. Y. C. P.-95,
Boomerang-Boomerang-Sis-Boom Bah!

Class Photograph—Moved, seconded and carried that committee be appointed to take up this matter.

D. M. WELLS,
H. B. FERGUSON.
T. S. BOYD.
Committee.

Class Valedictorian—Moved, seconded and carried that two members from each section be appointed to consider this matter.

F. P. BANNON,
R. C. WATLING,
G. F. SARTORIUS,
T. P. HEFFLEY,
Committee.

On motion, adjourned.

THOMAS P. HEFFLEY, Sec'y.

AT a special meeting held Wednesday evening, February 13, 1885, the following action was taken regarding the matter of Commencement:

Moved, seconded and carried that in order to meet the expenses necessarily attending a Commencement, as many as possible of the students contribute the sum of Ten Dollars; that such amount be paid to the Class Treasurer, who shall give his receipt for same, and that the treasurer transfer all such funds to the Chairman of the Lecture Committee, H. W. Atwood, who shall have charge of the matter.

No further business coming up, on motion, meeting adjourned.

THOMAS P. HEFFLEY, Sec'y.

P. S.—This meeting was held at the request of Mr. Atwood, and we take this means of expressing to him our thanks for his kindness in the way of advice, etc., and the pleasant manner in which he stated matters.

We would urge upon the students the importance of contributing as early as possible, and feel sure all will do their utmost in every respect to make the occasion one that will do credit to a college such as ours, unequaled as it is. '95 has unusual opportunities.

THE CRY OF THE SENIORS.

Do you hear the Seniors weeping, O my brother,
Ere examination comes with all its fears?
They are leaning their *young* heads against each other.
Even that cannot drive away their tears.
April day, with all its sun and all its showers,
Draweth nigh, but for them they have no charm,
For they fear that the roots and withered flowers,
With rhizomes and barks, will work them harm.
O the poor Seniors! O my brothers!
They are weeping bitterly—
They are weeping and wailing with each other
In the country of the free.

Do you question the poor Seniors of their sorrow,
Why their sodium chl ride tears are falling so.
They will tell you that they would like to borrow
The brains of some Professor ere they go
To meet the carbo-hydrates and their kindred,
Propenyl methyl, diphenylamine;
They would rather face amyl ethyl-hydroxide,
Or propenyl nitrates, known as ni'ro-glycerine.
The poor, poor Seniors! Oh, my brothers
Are weeping and wailing as they stand
Moaning and bemoaning with each other
In this bright and happy land.

Why, oh why did Lavoisier and Scheele
Work, and toil and strive with all their might and main
To find that elements unite in fixed proportions,
And gave atomic weights to tax the brain.
The law of Avogadro and Guy Lussac,
Basic compounds and the meta salts they fear—
Not to speak of basic acids, neutral oxides
Do you wonder the poor Seniors feel so queer?
Oh, the poor poor Seniors! Oh, my brothers,
They are weeping bitterly—
They are weeping in the springtime with each other
In this country of the free.

The poor Seniors are trying, O my brothers,
Not to mix alkalies with alkaloids,
Ferrous salts with any oxidizing agent,
NH_3 or chlorine with iodides;
With volumetric analysis they are struggling;
Gravimetric analysis makes them moan;
Then pile on solubilities and equivalents.
I think they have come to weep and moan,
The poor, poor Seniors. Oh, my brothers
Are struggling and striving as they stand
To keep their young heads above the water
In this bright and happy land.

By one of the "Poor, poor Seniors" of the Class of '95 of the N. Y. C. P.

Junior Notes.

ALTHOUGH nothing of especial interest has occurred among the Jr.'s this month in the way of class meetings, examinations or small incidents, there has been a gradual and very noticeable advance made in the work. Physics was finished and Physiology begun, the examination in the former being postponed until the end of the term. In the Pharmaceutical Laboratory a new and interesting line of work tending more toward Chemistry has been taken up. While in the Chemical Laboratory the work in unknowns among the metals is puzzling and interesting to all. In Botany and Pharmacognosy there has also been an advance, especially in the atter, where the study of cells and cellular structure with the compound microscope has proved of the greatest assistance and interest.

A NEW society has been organized. Our Secretary, Mr. F., was initiated the evening of the 11th with great ceremony. J. W. S. took the second degree a little later the same evening. For particulars inquire of the Class Secretary.

DEFINITIONS, QUESTIONS AND FACTS.

H.—Medicated waters are medicines which contain an unknown substance.

I WOULD like to know how many meters there are in one oz.? Also the shape and size of the numerical plan of a flower.

ALTHOUGH assured of the fact J. M— still has his doubts about a certain Prof. having feathers.

X.—Plants are divided into two great kingdoms—Organic and Inorganic.

D. B.—Would like to know why the study of plants entombed in the earth's crust is not fossil Botany.

CLASS REPORTER.

WHILE some workmen were digging recently among the ruined temples of Upper Egypt they unearthed an iron box containing a metal plate, which two scientists who have reputations at stake declare to be a camera and lens.—*Brit. and Col. Drug., 1894, 193.*

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A CRITICAL STUDY OF BETTENDORF'S TEST AND ITS MODIFICATIONS.*

By DR. CHAS. O. CURTMAN.
Chairman of Research Committee B.

A NUMBER of experiments have been made for the purpose of ascertaining the conditions most favorable to the result of the test for arsenic by stannous chloride (Bettendorf's test and its modifications).

The inquiry was directed to the following points:

1. The limit of sensitiveness of the test in its various modifications.

2. The best proportion of reagent to specimen.

3. The influence of the use of metallic tin together with the stannous chloride.

4. The influence of the presence of other substances in the specimen tested.

I. LIMIT OF SENSITIVENESS.

The following reagents were used:

a. The solution directed for Bettendorf's test by the U. S. P., consisting of a saturated solution of pure stannous chloride in pure concentrated hydrochloric acid. The specific gravity of this solution was = 1.467.

b. Metallic tin, perfectly pure, in thin cylinders, from which shavings of about 0.1 Gm. were taken as needed.

c. Stannous chloride solution prepared according to the German "Arzneibuch" by saturating a mixture of 5 parts of crystals of stannous chloride and 1 part of hydrochloric acid with dry hydrochloric acid gas. The specific gravity was = 1.912.

All the materials used were previously tested for absence of arsenic by Gutzeit's test, so as to exclude any fallacies arising from the introduction of even small traces of arsenic by the reagent, which might cumulate with those in the specimen.

It is easy enough to procure pure metallic tin, but impossible to obtain from local dealers hydrochloric acid sufficiently free from arsenic to stand Gutzeit's test for one hour; so that I had to distill from purified sulphuric acid and pure sodium chlorid the hydrochloric acid required for the preparation of the reagents.

A number of specimens of arsenic solution were made, containing free trioxide, sodium metarsenite and sodium arsenate in such proportion that each set corresponded exactly to an equal amount of As.

They were: *Arsenic trioxide* (As_2O_3 = 197.68), of which 1.31062 Gm. contain 1 Gm. of As.

* Report No. 1 of Research Committee B, of the Committee of Revision of the U. S. P., 1890.

Sodium metarsenite ($Na As O_2 = 129.82$) of which 1.7332 Gm. contain 1 Gm. of As.

Sodium arsenate, U. S. P. ($Na_2H As O_4 + 7 H_2O = 311.46$), of which 4,51834 Gm. contain 1 Gm. of As.

The solutions used for experiments contained from 0.5 Gm. to 0.01 Gm. of As.

Of these 1 Cc. was used for each trial and the amount of reagent mixed with this varied from 1 Cc. to 3 Cc., so as to correspond with the limits prescribed in the pharmacopœial tests. When metallic tin was added to the reagent 1 Cc. each of the specimen and the stannous chloride solution was used. In some cases of doubt a ten-fold quantity (10.30 Cc. etc.) was used to obtain sufficient material for colorimetic comparison.

A uniform application of heat was effected, whenever needed, by imbedding the series of test tubes under observation to an equal depth into a sandbath, heated to about 80° C.

Whenever comparisons of color became necessary to decide whether a deeper color had been produced than that of the unaffected reagent (as was especially necessary with the yellowish solution of the German Pharmacopœia, or whether a greater or less intensity of color characterized the reaction, narrow graduated cylinders of 10 cubic centimetres capacity were used in a dark box, with light reflected from beneath, or occasionally, for still greater accuracy, a pair of Hehner's colorimeter cylinders of 100 Cc. capacity, also placed for observation into a dark box, admitting from beneath light reflected upward by a plate of milk glass, placed at an angle of 45°.

With the aid of these appliances the following results were obtained :

a. With the U. S. P. solution of stannous chloride, of specific gravity 1.467, 1 Cc. of each of the three specimens, containing 0.5 Mgm. of As was mixed in the different proportions stated below, and kept at ordinary temperature for one hour.

With 1 Cc. of reagent a sharp reaction had taken place at the end of the hour.

With 2 Cc. of reagent the reaction was obtained earlier and was more intense at the end of one hour.

With 3 Cc. of the reagent the reaction was still more speedy and at the end of the hour more intense.

No difference could be noticed either in time or intensity between arsenic in the state of trioxid or pentoxid.

When the test tubes were arranged exactly as before, but placed in hot sand, the time was somewhat shortened, and a slight increase of intensity noticed in all of the specimens.

b. When 1 Cc. of the U. S. P. solution was used with 1 Cc. of solutions containing 0.5 Mgm. of As and a small piece of metallic tin added, and heat applied, the reaction was almost instantaneous, and in 3 minutes very sharp, unmistakable coloration appeared, which continued to increase in intensity for about 10 or 15 minutes, but was not notably darker at the end of the hour. No difference appeared in the different solutions containing arsenite or arsenate.

c. When from 1 to 3 Cc. of the stannous chloride solution of the German pharmacopœia was used with 1 Cc. of the solutions containing 0.5 Mgm. of As, there was a slight darkening of the color in a few minutes, which continued to increase to the end of the hour, No difference was perceivable between the arsenous and the arsenic preparations. At 15 minutes, the specimens treated by the U. S. P. solution and metallic tin showed a much greater intensity of color, but toward the end of the hour there was but little difference perceptible between the color of the specimens treated with 3 Cc. of the

German reagent, without heat, and that treated with 1 Cc. of the U. S. P. reagent, metallic tin and heat. The specimens containing less than 2.5 Cc. of reagent showed a less intense color.

These experiments were repeated with the three solutions containing 0.5 Mgm. As in 1 Cc. and resulted as follows:

a. With the U. S. P. solution of $Sn Cl_2$:—

1 Cc. of reagent gave no reaction during 45 minutes, then gradual coloration began. If heat be applied the reaction begins in 18 minutes, and at the end of one hour is slightly more intense than when treated without heat.

1.5 Cc. of reagent: reaction slightly more rapid and intense than with 1 Cc.

2.0 Cc. of reagent: still more rapid and intense, both with or without heating.

2.5 Cc. of $Sn Cl_2$: reaction begins in 15 minutes at air temperature, in less than 5 minutes when heated.

3.0 Cc. of $Sn Cl_2$: reaction slightly less intense than with 2.5 Cc., both hot and cold.

3.5 Cc. of reagent: a still further slight decrease in intensity.

No difference could be observed in the reaction of $As_2 O_3$ and $As_2 O_5$; the sodium metarsenite appeared to be very slightly more colored than $As_2 O_3$.

b. With 1 Cc. of U. S. P. solution and a small piece of metallic tin, at a temperature of about 80° C., 1 Cc. of the solution containing 0.05 Mgm. of As began showing a brownish color at 15 minutes. At 35 minutes the reaction was quite sharp and continued to grow slowly in intensity to the end of the hour.

No difference was perceptible between $As_2 O_3$ and $As_2 O_5$.

c. 3 Cc. of the solution of the *Arzneibuch*, mixed with 1 Cc. of the solutions containing 0.05 Mgm. of As began showing a feeble reaction at 35 minutes, and at the end of the hour, showed a plain reaction, as compared with the unchanged solution, but did not equal in intensity the reaction produced by the addition of metallic tin.

On repeating the experiments with solutions containing 0.03 Mgm. of As in 1 Cc. a feeble reaction resulted from the use of stannous chloride and metallic tin at the end of an hour, but even after standing over night, the other methods gave such a faint reaction that it required close inspection in the colorimeter to perceive the change. A solution containing 0.02 Mgm. of arsenic failed to show any reaction. So I think that *for practical purposes*, the utmost limit of reaction is reached at 0.03 Mgm. of As in 1 Cc. and that the method employing metallic tin and heat is to be preferred, where the presence of antimony or bismuth does not forbid its use. Even the addition of pure concentrated sulphuric acid, which was recommended when the test was first introduced, has not yielded to me any substantial advantage in detecting the presence of arsenic in the greater dilutions.

2. THE BEST PROPORTION OF REAGENT TO SPECIMEN.

In the foregoing experiments and a number of others conducted for that purpose, it was observed that both with the U. S. P. solution (without the use of metalic tin) and with that of the German Pharmacopœia, the greatest intensity of color obtained after an hour's reaction occurred when 1 Cc. of the arsenical solution was mixed with 2.5 Cc. of the reagent. Between 3 Cc. and 2 Cc. of the German solution hardly any difference could be found. But with the pale U. S. P. solution a very slight difference appeared in favor of 2 Cc. as against 3 Cc. Heat did not appear to affect the proportion needed.

When metallic tin was added it seemed

to be best to use equal volumes of specimen and reagent, although the variable amount of dark coatings of reduced arsenic adhering to the tin prevented an accurate comparison.

3. INFLUENCE OF THE USE OF METALLIC TIN TOGETHER WITH STANNOUS CHLORIDE.

When metallic tin is heated with pure concentrated hydrochloric acid, a copious evolution of hydrogen results. When heated with the saturated solution of stannous chloride in hydrochloric acid, the evolution of hydrogen is but scant. When arsenic is mixed with the solution, the evolution of gas is perceptible, but very feeble. Very little arsine appears to be evolved, for a paper cap with a drop of acidulated silver nitrate does not show any evidence of reduction by $As\ H_3$ for over 15 minutes, and even at the end of an hour but a very faint arsenic reaction is seen. To ascertain whether any of the arsine formed, would react with the stannous chloride and thus hasten the reduction of As, I arranged a small apparatus in which a copious current of arsin mixed with hydrogen was generated, and, after passing through a bottle filled with dry cotton, was permitted to bubble through stannous chlorid solution of the U. S P. After more than an hour's time, not a trace of coloration could be detected.

So that after arsine has once been formed, it is not again decomposed by stannous chloride. Hence the prompt action of metallic tin must depend upon the nascent hydrogen, which aids the stannous chloride in reducing the trioxide and pentoxide.

But however satisfactory the action of metallic tin in accellerating and intensifying the reduction of arsenic, it cannot be employed to detect arsenic in preparations of bismuth or antimony. For the metallic tin reduces both of those metals and precipitates them from their solution as black flocculi, which aggregate into small granular lumps. There could be a distinction made between the firm flocculi of Sb or Bi and the finely divided brown particles of arsenic, but it would hardly be safe to trust to this appearance for a sufficient evidence of the presence of arsenic, and the preparations of Bi and Sb must be tested without the aid of metallic tin.

A number of specimens of pure bismuth and antimony salts were tested with the U. S. P. and the German solution of stannous chloride in various proportions. But neither at ordinary temperature, nor when heated did the least coloring occur.

4. INFLUENCE OF THE PRESENCE OF OTHER SUBSTANCES IN THE SPECIMEN TESTED.

The preceding experiments were made with a solution of either arsenic trioxide or sodium arsenite or arsenate in water, other substances being absent. But in testing various chemicals for traces of arsenic there are different conditions, as the arsenic forms only a very small portion of the mixture. In the U. S. P. the Bettendorf test is directed for 11 preparations: For hydrobromic, hydrochloric, phosphoric and sulphuric acid, 1 Cc. of the acid is to be tested by mixing with 1 Cc. of the reagent, adding a small piece of tinfoil and heating. In case of magnesium sulphate 1 Gm. of the dry substances is to be shaken with 3 Cc. of the reagent, metallic tin is then to be added and an hour allowed for the appearance of the reaction; sodium phosphate and pyrophosphate are treated in like manner, but heat applied and 15 minutes time given.

In case of antimony and potassium tartrate, antimony oxide, bismuth subcarbonate and bismuth subnitrate, it was intended to test with stannous chloride alone for an hour, but by an unfortunate misunderstanding of the transcriber, tin-foil was directed to be added, which will reduce Bi and Sn as well as As.

To find whether any of the chemicals directed to be tested by the stannous chloride method could influence the detection of arsenic, specimens were prepared containing the pure chemicals, shown to be free from arsenic by other tests, and with these small portions of arsenic were mixed, and the tests compared with those in which arsenic was present in equal amount without admixture with the chemicals.

In no case could any difference in the intensity of the test be made out, nor were the differences in the time of the occurrence of the coloration sufficiently great or regular to justify the assumption that the reaction was impeded or accelerated by the presence of other salts.

The Aldehyde from Oil of Lemon Grass.—P. Barbier. When geranaldehyde is treated with chromic acid mixture at a low temperature, it yields formic and acetic acids and a methylhexyleneketonecarboxylic acid, $C_8H_3O.COOH$, which yields iodoform when mixed with potassium iodide and sodium hypobromide. This acid would seem to be identical with the oily acid obtained by Tiemann and Semmler; which yielded methyl hexylene ketone when distilled. When oxidized by means of boiling chromic acid mixture, geranalehyde yields carbonic anhydride, acetone, acetic acid, and terebic acid, $C_7H_{12}O_5$. When boiled with three times its weight of glacial acetic acid for twenty-four hours, geranaldehyde is converted into cymene. It would follow from these reactions that geranaldehyde has the constitution $CH_2.CMe\ CH_2.CH_2.C.(COH){:}CMe_2$, and not that ascribed to it by Tiemann and Semmler. Its conversion into cymene can be explained by assuming that the acetic acid first acts as a hydrating and afterwards as a dehydrating agent.—*Compt. rend.*, 1894, 1050.

Meythyl Acetate is a solvent of remarkable powers and in many cases can be used as a substitute for ether. E. R. Squibb is experimenting to manufacture this product in large quantities from wood spirit and at a proportionally small cost.—*Ephemeris*, 1625.

CHEMISTRY IN THE UTILIZATION OF RAW MATERIALS.

BY PROF. ARTHUR H. ELLIOTT.

(*Continued from March issue.*)

But Thomas found out by a series of careful experiments that in the steel manufactured with lime, the lime took the phosphorus out of the material when it was being melted and formed a slag rich in phosphoric acid and which is utilized as a fertilizer, and to-day there is not an iron ore that will not make good steel by the Thomas process. This means cheaper steel, makes it possible to build bridges and railroads with much more safety. It is a factor of safety, to lessen the loss of life and should lessen the premiums on life insurance.

I have already gone over quite a number of processes of manufacture and could give you illustrations of the utilization of raw materials from many more, but I won't exceed the time allotted to me too much.

I want to make a few general remarks. I fear that I have been too prodigal with figures and that in my own person have been an example of waste, of one wasting time. But I hope not and I believe you have been interested.

Waste in many cases leads to nuisance and people demand improvement with regard to nuisances. Improvement in this direction is always profitable in the long run ; the products are found to be valuable when they are applied to new uses, and the elements of pollution of air and water have often been found sources of wealth, when properly taken care of. The English law says with regard to the sulphurous acid escaping from chimneys of chemical works, the air shall be sent out containing not more than five grains of sulphurous acid to the cubic foot, and the methods in practice have been so perfected that this rule is no hardship and to-day it is rare to find a factory that will exceed one grain to the cubic foot and the average output is 0.78 grain. Take the question of hydrochloric acid, in early times this was found to kill all the vegetation around the works. Then the manufacturer ran water down the chimneys and into the streams, and he was compelled to stop this. He said he would have to close up his works, but he learned to convert the acid in chlorine and make bleaching powder and he sends it all over the world to bleach linen and cotton, a positive source of revenue and not waste.

"Economy is wealth" is an old saying. Wealth has its source in the application of the mind to nature. Should not then all men be rich? Men are urged by their ideas to acquire command over nature; cultivated labor drives out brute labor. A good man of business knows the adjustment of cause and effect; for every effort there is a perfect cause. Good luck to him is tenacity of purpose. Open the doors to talent and virtue, they will do themselves justice and property will not be in bad hands.

Every man moving to this city with purchasable skill in him gives every other man's labor a new worth. The true citizen merchant has but one rule, *absorb* and *invest*, don't *hoard*. He must be a capitalist. The scraps and filings must be gathered together again and placed in the crucible, the gas and smoke and dust must be burned, and earnings must not go to increase expense, but back to capital again.

In this great city surrounded by the triumphs of science and engineering, you, whose rivers are ploughed by the ocean greyhounds, you know well that in the achievements of science there is not only beauty but power. She has not only revealed the wonders of the infinite space with innumerable worlds, infinite time peopled by unnumbered existences, infinite organisms hitherto invisible, but she is an Archangel of Mercy devoting herself to the service of man. Science labors not to increase the power of despots, but to extend human happiness, economize human effort, extinguish human pain. She has enlisted the sunbeam to paint for us the faces of those we love; she has enabled us to talk and hear the voices of those dear to us though separated by miles of distance; she has given us the means to hush the sufferer under the surgeon's knife, she points to our railroads, steamships and telegraphs, our electric lights, not as the results of the degradation of mankind or the toil of slaves, but as the rewards of pleasant days and years studying her methods of working and filling our hearts with the pleasure of the acquisition of knowledge.

All is waste and worthless, till
Arrives the wise selecting will
And out of slime and chaos, wit
Draws the threads of fair and fit.
Then temples rose, and towns, and marts
The shop of toil, the hall of arts,
Then flew the sail across the seas
To feed the North from tropic trees;
The storm wind wove, the torrent span
Where they were bid, the rivers ran;
New slaves fulfilled the poet's dream,
Galvanic wire, strong shouldered steam.

Relation between Depression of the Freezing Point and Osmotic Pressure of Solutions.—C. Dieterici. In answer to Arrhenius, the author admits the greater accuracy of Juhlin's observations on the vapor pressure of ice and water at temperatures below 0° as compared with those of Fischer, but still maintains that no strict proportionality exists between the depression of the freezing point and the osmotic pressure of solutions. The theoretical relationship existing between these two quantities is deduced, and it is shown that the assumption hitherto made, that the heat of dilution of dilute solutions is so small that it may be neglected, is incorrect.—*Amer. Phys. Chem.*, 1894, 263.

Hemalbumin is much recommended in cases of chlorosis. It has an acid taste, is very soluble in water, beer and wine, and contains all the elements of blood, such as hæmatin, hæmoglobin. Iodosuccinimide is a substitue for iodoform. Its name at once demonstrates its composition.

THE Alumni Journal

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FELLOWSHIPS AND THE COLLEGE OF PHARMACY OF THE CITY OF NEW YORK.

THE readers of THE ALUMNI JOURNAL have been repeatedly informed of the progress and evolution in pharmaceutical education. The October issue of THE ALUMNI JOURNAL may be said to contain the salient features upon which important decisions for pharmaceutical progress depend There can be hardly a question but that few of the institutions teaching pharmacy are fairly and squarely meeting the points at issue and are building their structures in consonance with the demands of the times. Neither lengthening the curriculum merely nor the addition of Post Graduate courses will remove the element that is like a parasite infesting the drug business to day, and without any professional honor obtaining the very life and sustenance of the men educated in our schools of pharmacy. The evils perpetrated by some members of Boards of Pharmacy giving certificates for nostrums and also some manufacturers connected with colleges of pharmacy frequently resorting to all kinds of shameful practices in order to make money for themselves are well known to the readers of THE ALUMNI JOURNAL. There is a condition in pharmacy to-day as, if not more odious possibly, than was the Tammany in politics. And we are in need of as great a reorganization in pharmacy as was instituted a few months ago in politics.

We again call attention to one of the most interesting phases of pharmaceutical education, as manifested in our Western colleges affiliated with the State Universities in providing Pharmaceutical Fellowships. In the November issue of THE ALUMNI JOURNAL we called attention to the Pharmaceutical Fellowship for three years endorsed by the School of Pharmacy of the University of Wisconsin. We now learn that the School of Pharmacy of the University of Michigan, Ann Arbor, has received a gift of a "Fellowship of Pharmaceutical Chemistry and Pharmacology," entitling some worthy student to devote two years to original research. It seems so strange that the idea which was originated here in the East and so strongly supported in the East should mature only in the

West. When will we in the East awake out of our lethargy and see that the sons and daughters are ascending the hilltops carrying the hopes of pharmaceutical education? When will we see that in laboring for the things that glitter we are securing the things that must soon vanish? When will we learn that quality is more desirable than quantity and that requirements which bring numbers are not likely to develop efficient men?

There is probably no city in the world where so much wealth is concentrated as in New York City, and there is probably no place where such generosity is shown in the support of institutions of education as in New York City. It is highly probable that if the College of Pharmacy of the City of New York really wanted a Pharmaceutical Fellowship, that her Board of Trustees and others would be able without much difficulty to secure a fund of a thousand dollars annually and so be able to provide two fellowships annually for able and deserving students. If the Trustees doubt this then there is no question (for very able educators have repeatedly called attention to this) that it would be far more profitable for the College of Pharmacy of the City of New York to provide a fellowship with its prize money rather than divide it among the prize men. The hundred dollar prize is very insufficient for further study to any of the prize students, and the writer is never aware of any prize student of any institution that used the money either for the benefit of his alma mater or his profession, but he has seen it repeatedly bestowed upon "the falsely ambitious student" and "superficial student," whose only merits were their ability to cram so many lectures or do in a similar manner a certain amount of practical work.

A fellowship in the College of Pharmacy of the City of New York would return in many times its value to the institution in the course of ten years and would be of far more lasting value to the college and her students than all the prize money, which is unquestionably wasted so far as its object is concerned. Some may commend prizes as being an incentive to the class for study. This motive is a wrong one and is at the least a weak commendation. The arguments in favor of Pharmaceutical Fellowships are well known to the readers of THE ALUMNI JOURNAL for they have been well presented by Prof. Kremers and Prof. Patch in these columns. The requirements for a fellowship have been ably prepared by E. L. Patch in his recommendation to the American Pharmaceutical Association last September, and we reprint them again, with some modifications, as showing along what lines requirements should be based:

THE CANDIDATE.

First.—He must be an honor graduate (not necessarily a number one man) of the College of Pharmacy of the City of New York.

Second.—He must pass a good physical examination.

Third.—He must be free from the impairment caused by indulgence in the use of tobacco, alcoholic beverages or any other vice that hinders the highest possible physical development and the severest training of the body and mind.

Fourth.—He shall present to the Examining Board an original paper involving the results of personal observation or experience in some department of investigation of value to pharmacy. This paper shall be published if considered worthy.

Fifth.—He shall pass a satisfactory examination in Mathematics, Geography, American History, Botany, Theoretical Pharmacy, Chemistry, and Latin of Pharmacy and Medicine.

CHARACTER OF TRAINING.

The successful candidate shall be instructed in some desirable school or schools or university where he may secure, during three years, the highest training in synthetic chemistry, plant analysis and manufacturing pharmaceutical processes. He shall submit to this college an annual report embracing a resumé of the year's instruction and the methods of instruction employed and at intervals during the three years' course shall present an outline of methods employed and facilities enjoyed in teaching pharmacy.

He shall also submit annually a resumé of all original work personally performed during the year, in suitable form for publication.

Any failure to meet the responsibilities of the fellowship may because for his recall and substitution for another candidate.

When his work is finished he shall give at least two years to instruction in some college of pharmacy (if such position offers, as it undoubtedly will), and present each year for two years an original paper for publication.

NEW LITERATURE.*

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Field, Foresl and Garden Botany. A. Gray. Revised by Prof. L. H. Bailey. This work is specially suited to the analysis of cultivated plants.

Laboratory Exercises in Botany, designed for the use of colleges and other schools in which botany is taught by laboratory methods. By Edson S. Bastin. Illustrated. Philadelphia: 1895.

The Medicinal Plants of Tennessee.—Exhibiting their commercial value, with an analytical key, descriptions in aid of their recognition and notes relating to their distribution, time and mode of collection and preparation for the drug market. Arranged and published under the direction of T. F. P. Allison. By A. Gattinger, 1894. Franc M. Paul. Printed for the State.

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Medizinische Chemie in Anwendung auf gerichtliche, sanitäts polizeiliche und hygienische Untersuchungen, sowie auf Prüfung der Arzneipräparate. Ein Handbuch für Aerzte, Sanitätsbeamte und Studirende. 2te, vielfach verbesserte und vermehrte Auflage. Wien u. Leipzig: Urban u. Schwarzenberg.

Manuale di Chimica clinica: analisi delle urine e ricambio materiale, compilato dall dott.—E. Reale. Neapel: Giovanni Boeri.

Ausführliches Lehrbuch der pharmaceutischen Chemie.—E. Schmidt. 2. Band. Organ. Chemie. 3. Aufl. 1. Abth. Braunschweig: F. Vieweg u. Sohn.

A Text-Book of Volumetric Analysis with special reference to the volumetric processes of the Pharmacopœia of the United States, designed for the use of pharmacists and pharmaceutical students, by Henry W. Schimpf. New York: John Wiley and Sons, 1894.

Text-Book of Medical and Pharmaceutical Chemistry.—By Elias H. Bartley. Third edition, revised and enlarged. With eighty-four illustrations. Philadelphia: P. Blakiston, Son & Co.

Agenda du Chimiste pour 1895.—Paris: Hachette et Cie.

Leçons de Chimie à l'Usage des élèves de Mathématique spéciales.—2. Ed. H. Gauthier et G. Charpy. Paris: Gauthier Villars et Fils.

A Text-Book of Chemistry. S. P. Sadtler and Henry Trimble. Phila.: J. B. Lippincott Company.

This is a compendious work of 950 pages and intended for the use of pharmaceutical and medical students. Part I, treats of Elementary Physics which for the ground covered is well executed. Part II, deals with the Chemistry of the Non-Metals and contains an excellent

*Readers desiring any of the works contained in this list can obtain them through B. Westerman & Co., 812 Broadway; Gustav E. Stechert, 810 Broadway, or other foreign booksellers.

chapter on chemical reactions and equations, laws of combination by weight and volume, etc. It also contains many practical exercises for the use of the student in the store or laboratory. The Non-Metals as well as Metals in chapter III are considered as regards history, occurrence and formation, preparation, properties, uses, detection with an account of the official preparations and all necessary information relating thereto. Part IV, treats of Organic Chemistry containing an introductory chapter also chapters devoted to open-chain or aliphatic hydrocarbons, derivatives of the same, closed chain groups with less than six carbon atoms, closed chain or aromatic compounds, aromatic compounds containing one nucleus, aromatic compounds with more than one nucleus, alkaloids and ptomaines, the terpenes and their derivatives; glucosides, bitter and neutral principles and tissue forming substances or proteid matter. Part V is a consideration of analytical chemistry (qualitative and quantitative) and pharmaceutical assaying.

The merits of this book are apparent from beginning to end. It is difficult to say just what portion is better than another. The matter is put clearly, logically and in a most assimilative manner. The paper, printing and binding are in character with the reading matter, and while it is seldom that THE ALUMNI JOURNAL recommends a book to its readers we feel safe in saying that as a book on medical and pharmaceutical chemistry there is no book published anywhere so replete and of so great value either to the pharmacist or physician as this addition to literature. We wish so much that other authors would examine and study this book and then they would understand why their books cannot be recommended and why they must fail absolutely. On the other hand, this work of Sadtler and Trimble is a real contribution to the professions of pharmacy and medicine and no one, probably, concerned in these professions ought to be without it.

Organic Chemistry.

Organic Chemistry.—W. H. Perkin and F. S. Kippling. 8. London : W. and R. Chambers.

Pharmacy.

Kommentar zum Nachtrag zum Arzneibuche für das Deutsche Reich. — Hager, Fischer, u. Hartwich. 3. Ausgabe. Berlin : J. Springer.

Jahresbericht der Pharmacie für 1893 u. 1894. — Heinrich Bechurts. Gottingen : Vandenhoeck u. Ruprecht.

The Law of the Apothecary, a compendium of both the common and statutory laws governing druggists and chemists in Massachusetts, Maine, New Hampshire, Vermont, Rhode Island and Connecticut, by George Howard Fall.

It consists of five sections or chapters. First, Civil Liability ; second, Criminal Liability ; third, Pharmacy Boards ; fourth, Liquor Laws ; fifth, Pharmacy Laws of those States.

Physics.

An Introduction to the Study of Electricity.—L. Cummings. With numerous examples. 4th Ed. with corrections and additions. New York : Macmillan.

The Student's Text-Book of Electricity.—H. H. Noad. With an introduction and additional chapters by W. H. Preece. London : Crosby, Lockwood and Son.

Ueber die Beziehung hochgradiger Quecksitberthermometer aus Jenaer Glas 59[111] auf das Luftthermometer zwischen 300 u. 509°. — A. Mahlke. Inaug.-Dissert. Gottingen ; Vandenhöck u. Ruprecht.

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Terapeutisk repepthandbog fo grundvalen af den nor diska landernas farmakopëer.—S. Ribbling. 12°. Lund : C. W. K. Gleerup.

Secret Nostrums and Systems of Medicine.—A book of formulas. Compiled by Charles W. Oleson. Fifth edition revised and enlarged. Chicago : Oleson & Co.

It contains descriptions of the composition of some 353 patent medicines and gives detailed explanations of a number of widely advertised and baneful systems of quackery.

LITERATURE.

DISPENSATORIES IN THE S. A. D. SHEPPARD LIBRARY, BOSTON COLLEGE OF PHARMACY

(*Continued from March, 1895, issue.*)

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The same. 3 ed. Philadelphia, 1836.
The same. 4 ed. Philadelphia, 1839.
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The same. 7 ed. Philadelphia. 1847.
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American Dispensatory, containing the operations of pharmacy, etc., adapted to the practice of medicine and pharmacy. (J. R. Coxe,) Philadelphia, 1806.

The same. 3 ed. Philadelphia, 1814.
The same. 4 ed. Philadelphia, 1818.
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The same. 6 ed. Philadelphia, 1825.
The same. 8 ed. Philadelphia, 1830.
The same. 9 ed. Philadelphia, 1831.

The New American Dispensatory, comprising a system of pharmacy and materia medica, etc. Philadelphia, 1839.

Thacher (*J.*) *The American New Dispensatory.* Boston, 1810.

The same. 2 ed. Boston, 1813.
The same. 3 ed. Boston, 1817.
The same. 4 ed. Boston, 1821.

Eclectic Dispensatory of the United States. (King and Newton.) Cincinnati, 1852.

The same. Philadelphia, 1827.

A Dispensatory or Commentary on the Pharmacopœias of Great Britain and the United States. (Christison.) Philadelphia, 1848

New (*The*) *Dispensatory.* Containing the elements of pharmacy, the materia medica and the preparation of the new London and Edinburgh Pharmacopœias. London, 1770.

The same. (Lewis.) London, 1781.

A Complete English Dispensatory. In four parts. (John Quincy.) London, 1719.

The same. 11 ed. London, 1739.
The same. 12 ed. London, 1749.
The same. 13 ed. London, 1761.
The same. 15 ed. London, 1782.
The same. (Colborne.) London, 1756.

Dispensatory of the Rayal College of Physicians of London. (Pemberton.) London, 1746.

The same. London, 1760.

New English Dispensatory. (J. Alletrue.(?) London, 1733.

London Dispensatory. A practical synopsis of materia medica, pharmacy and therapeutics. (Thomson.) London, 1830.

The same. London, 1831.
The same. London, 1824.
The same. London, 1826.

The Edinburgh New Dispensatory. Edinburgh, 1786.

The same. Edinburgh, 1790.
The same. 3 ed. Edinburgh, 1791.
The same. 5 ed. Edinburgh, 1792.
The same. Philadelphia, 1794.
The same. Boston, 1796.
The same. (A. Duncan.) Edinburgh, 1803.
The same. (A. Duncan.) Edinburgh, 1804.
The same. (A. Duncan.) Boston, 1805.
The same. (J. Dyckman.) New York, 1818.
The same. (A. Duncan.) 10 ed. Edinburgh, 1822.
The same. (A Duncan.) 11 ed. Edinburgh, 1826.
The same. Edinburgh, 1830.

New Universal English Dispensatory. (R. James.) 3 ed. London, 1764.

Bengal Dispensatory. (O'Shaughnessy.) Calcutta, 1842,

Culpeper's English Family Physician; or, Medical Herbal. Enlarged. (J. Hamilton.)Vols. I. and II. London, 1792.

Salmon's English Physician; or, the Druggist's Shop Opened. 1690.

Supplement to the New London Dispensatory. (Salmon.) 1688.

Treatise on the Materia Medica. Intended as a sequel to the Pharmacopœia of the United States. Boston, 1822. (Bigelow.)

A Translation of the London Dispensatory. (Culpeper.) London, 1649.

A New Dispensatory. Compiled at the command of His Royal Highness the Duke, for the use of the military hospital abroad. London, 1749.

L'officine au Repertoire General De Pharmacie Practique. (Darvanet.) Paris, 1867.

Commentar zur Pharmakopoe fur das Konigreich Bayern. (Schwarzenbach and Henkel.) Wurzburg, 1858.

Kommentar zu der Preussinchen, Sächsischen, Hannoverischen, Hamburgischen und Schleswig-Holsteinchen (Hager.) Lissa, 1857.

Commentar zur Preussischen Pharmacopoe (Mohr.) Braunschweig, 1863.

Hennig's Commentar und Wörterbuch zu allen Pharmacopœn. Dresden.

Dispensatorium Electorale Hassiacum. Marburgi, 1775.

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1. *Luminare Majus.* (By) Manlius (Joh. Jac.) de Boses. Fol. 1528. Lugduni, apud Antonium Blanchard. With this bound (2) Luardus (Paulus) *Thesaurus Aromatariorum.*

1. The Greater Luminary. An excellent work, most necessary to all physicians and spice dealers (the druggists of that time).

2. The Treasury of Spice Dealers. Not less useful and necessary. An alphabetical index of both simple and compound medicines is appended at the end of each work.

THE MOST RECENT WORK.

Sandalwood Oil Pills.—Calmel (*Apoth. Zeit.*, 1894) recommends: Melt 4 Gms. of rosin and add 5 Gms. of the oil previously ground with ½ Gm. magnesia. Mix well and when cold divide into pills.

Aromatin.—According to Schweissinger, this powder which is said to be the aromatic extractive of the hop, is coarsely powdered gentian root. *Apoth. Zeit.*, 1894, 519.

Pepsin Wine.—This preparation is official in the German Pharmacopoeia, glycerin being employed as a preservative. In the second edition of that work the formula was as follows: Pepsin, 50 Gm.; glycerin, 50 Gm.; water 50 Gm.; acid hydrochloric, 5 Gm.; white wine, 1845 Gm. That in the later edition, however, is different, being: pepsin, 24 parts; glycerin, 20; acid hydrochloric, 3; water, 20; syrup, 92; tinct. aurant, 2; sherry wine, 839, or enough to make 1000 parts. The first four ingredients are directed to be mixed together and allowed to stand eight days. Filtration is then performed, and the other ingredients are added. Schmiedeberg objects to the addition of glycerin as being injurious, and other writers have objected to the use of wine, alleging that the alcohol present might hinder the action of the ferment, though no satisfactory evidence appears to have been produced on either of these points. The addition of syrup is strongly recommended by several of these individuals, but a writer in the *Bull. Pharm. de Bruxelles* suggests that the proportion of syrup should never exceed 20 per cent. as it may check the digestive action of the pepsin, Vulpius having shown that whereas albumin 10 Gm. may be digested in one hour by pepsin 0.10 Gm. in the presence of hydrochloric acid; 10 drops, diluted with water, 100 Gm., the addition of sugar, 10 Gm. prolongs the period of digestion one to five hours. The presence of alcohol, 1 Gm., or sweet wine, 4 Gm., prolonged the period to one hour and twenty minutes only.—*Pharm. Jour. Trans.*

Chromic Acid and Cocaine Hydrochlorate.—James McBain on the dispensing of the following prescription:

℞	Acid. chromic. - - -	4 Grs.
	Cocain. hydrochlor - -	7 "
	Aquæ - - - - - -	℥ ii

Solve.

The acid was dissolved in ℥i. of water, and the cocaine hydrochlorate in the other ℥i. of water. On mixing the two solutions the whole became thick from the separation of an orange-yellow precipitate. The action seems similar to that of the United States Pharmacopæia test, in which, on adding 5 Cc. of a 5 per cent. solution of chromic acid, to 5 C.c. of a 2 per cent. solution of cocaine hydrochlorate, a yellow precipitate is produced, which re-dissolves on shaking, and again separates as a permanent precipitate on the addition of 1 C.c. of hydrochloric acid. In this case the precipitate did not re dissolve on shaking, and the alkaloidal salt on examination was found to be slightly acid. On applying to the prescriber, he said the cocaine could be omitted, as it was intended to mitigate the pain produced by chromic acid, applied as a caustic.

Mr. Hill said this was somewhat analogous to the use of cocaine along with nitric acid. Perhaps the object of the prescriber could have been attained by applying a solution of cocaine first, and after giving time for the production of local anæthesia, apply the chromic acid solution.—*Brit. and Col. Drug.*, 1893, 132.

Chrysarobin.—C. Ed. Sage finds that if the powders are quite dry and are kept away from the light they do not materially change in color, even when wrapped in paper only; neither do they alter much when damp if they are placed in bottles and securely corked; but if they are moist and are left exposed to the air they soon begin to assume a darker color.

The samples examined consisted of lumps of crude chrysarobin of a pale yellow color, mixed with wood, powder and moisture. The figures comprise the results of the following estimations:

1. Moisture: The loss after drying the powdered drug for 12 hours at 100°C was taken to represent this factor. 2. Ash: This was estimated by igniting 2 Gms. of the previously powdered drug 3. Chrysarobin. By this is meant the product obtained by extracting with boiling benzol or chloroform; this was also estimated in 2 Gms. of the previously dried powdered drug.

1. The average amount of moisture found in 72 samples was 12.7 per cent.; the lowest figure obtained being 1.7 per cent. and the highest 39.7 per cent. Three of the samples contained over 30 per cent. of moisture, 11 between 20 and

30 per cent. 53 between 5 and 20 per cent., aud only five below 5 per cent.

2. The average amount of ash yielded was found to be 26.9 per cent., the lowest figure obtained being 0.8 per cent.; the highest, however, reached 65.6 per cent. Twelve samples yielded over 40 per cent. of ash, 27 between 30 and 40 per cent., 11 between 20 and 30 per cent., 14 between 5 and 20 per cent., and eight less than 5 per cent., of which two yielded less than 1 per cent.

In the results obtained by E. J. Millard, when examining some samples of araroba a short time ago, it is stated that the ash varied from 9 16 per cent. to 21.6 per cent., and in a previous paper by the same author, the ash in one instance was found to be 28.6 per cent.

Upon examination of the ash it was found to be of a gritty nature, and composed principally of silica and a small proportion of ferric oxide and aluminia. From this, therefore, he draws the very unsatisfactory conclusion that araroba is largely adulterated with sand.

3. The chrysarobin figures obtained were as follows: Average percentage, 25.7 per cent., the highest yield being 73.25 per cent., and the lowest 2.65 per cent (the sample yielding this small amount of chrysarobin contained 6.27 per cent. moisture, 65 6 per cent. ash, and a large amount of wood). Of these results, 10 samples yielded over 50 per cent., seven between 40 and 50 per cent., three between 30 and 40 per cent., 16 between 20 and 30 per cent, 25 between 10 aud 20 per cent., and 11 less than 10 per cent. The average yield of chrysarobin is a very low one compared with that obtained by Attfield in his original investigation, and also considerably lower than that obtained more recently by Duncan, and it tends to show that araroba is not only wilfully adulterated but is very carelessly collected.

The chief use for araroba in England is for preparing chrysarobin and the so-called chrysophanic acid. From the examination of many trade samples of this latter substance he finds it is nothing more or less than the chrysarobin as specified by the British Pharmacopœia, and containing only small proportions of chrysophanic acid.

Chrysophanic acid has a definite chemical composition, and can be obtained from many other sources besides araroba; therefore it would be much more satisfactory if the name were reserved for the true substance, and not applied to chrysarobin. Evidently araroba is extensively adulterated aud carelessly collected; aud the application of the proper names should be made to the different products of *Andira araroba*, and that araroba or goa powder should be reserved to designate the crude drug; chrysarobin, the product obtained by solvents from araroba; and chrysophanic acid, the product obtained either by the oxidation of chrysarobin or from other sources, and having the formula $C_{15}H_{10}O_4$.—*Brit. and Col. Drug.*, Jan. 18, 1895.

Crystallization of Syrup. — Carles (*Rép de Pharm.*, 1894, 539), says that syrups will either keep intact as the case with syrups of chloral, cherry-laurel, etc., or they will ferment as in the case of syrups of ipecac, opium, violets, fruit syrups, etc.; or they will crystallize, and then, as they have, so to speak, lost part of their sugar, are considered easily liable to alteration. This idea is, however, found to be incorrect. Carle's experience is that syrup can easily be supersaturated with sugar, and that when left at rest and in a cooler place than that in which they were prepared, they deposit the excess of sugar and return to their normal state and leave properly saturated syrup. In the author's experience this is the sole cause of the phenomenon of separation of the crystals in such cases.

Approximative Determination of Albumin in Urine.—In cases where it is not essential that the determination of albumin in urine should be very exact, Rössler recommends a volumetric method which can be carried out very readily, and give results that are comparable. Into a test tube containing a mixture of 5 C.c. of acetic acid and two or three drops of potassium ferrocyanide solution (1 to 10), the urine to be tested is poured through a funnel, so as to form a layer on the surface. When albumin is present a white zone is formed, which is proportionate in thickness to the amount of albumin, and the indication thus afforded in from ten to thirty minutes may be taken as a measure of the relative proportion of albumin in the urine.—*Apoth. Zeit.*, 1894, 563.

Test for Chlorides.—Villiers and Fayolle find that a still more delicate test than the one they recently proposed for chlorides consists in substituting orthotoluidin for the aniline previously recommended. A sharp reaction is then obtained with less than 1/10 Mgm. of chlorine, a fine blue coloration resulting, and changing to a reddish-violet on the application of heat or cold. The reaction is, however, not sharply defined from that given by bromides under similar conditions, unless aniline also be present. The following formula is therefore given for the reagent:—Colorless, saturated, aqueous solution of anilin, 100 C.c.; saturated, aqueous solution of orthotoluidin, 20 C. c.; glacial acetic acid, 30 C.c. On using this reagent, any bromides and iodides present are acted upon by the anilin, forming white or colorless compounds, and the action of the orthotoluidin on the chlorides present is not obscured.—*Pharm. Jour. Trans.*, 1894, 71; from *Comp. rend.*, cxviii., 1413.

Crystallized Aluminium Carbide.—H. Moissan has prepared, by the aid of his electric furnace, a crystallized compound of carbon and aluminium, represented by the formula C_3Al_4. The compound occurs in the form of fine, transparent, yellow crystals, attaining a diameter of 5Mm. to 6 Mm. in some instances. Their density is 2.36, and the compound requires the highest temperature of the electric arc for decomposition. It possesses very marked reducing properties, and slowly decomposes water at the ordinary temperature, methane, CH_4, being evolved.—*Comp. rend.*, cxix. 16.; *P. J. Tr.*

Iodides of Narceine.—G. B. Frankforter describes these compounds. The blue iodide, $(C_{23}H_{27}NO_8)_3I_2+3H_2O$, is formed when narceine is treated with an aqueous solution of iodine. Also, by treating crystals of narceine direct with iodine, indigo-blue crystals are formed, which retain the same crystalline form as the narceine. On heating these crystals they change from fine long prismatic needles to short irregular ones. The blue crystals are slightly soluble in water, soluble with difficulty in alcohol quite insoluble in ether or chloroform, and melt at 176°–177°. The red iodide, $(C_{23}H_{27}NO_8)_3I$, is formed by treating narceine with an alcoholic solution of iodine, the greyish-blue product changing to red and losing its crystalline form on standing in the air or gently heating. It melts at 181°, and is insoluble in water, alcohol, or ether. Both iodides are transformed into narceine by carefully neutralizing with sodium hydroxide. In the presence of an alkali no iodide is formed from narceine.—*Journ. Am. Chem. Soc.*, 1894, 361.

Micro-chemistry of Albuminoids. — De Wevre concludes an exhaustive communication on the methods employed in micro-chemical researches on the albuminoids, by stating that these compounds cannot be localized by any single reagent, a combination being required always. He recommends that sections should be boiled first in water, and then in absolute alcohol, before adding reagents. The best o these for the purpose, arranged in the order o their sensibility, are iodized potassium iodide or an aqueous solution of eosine; Millon's reagent; picric, xanthoproteic, or phosphomolybdic acid and Guezda's reaction; Piotrowski's biruet reaction; Reichel and Mikosch's reaction. If all these reagents act, after treatment of the sections with boiling water and alcohol, it is safe to conclude that proteid substances are present. In Guezda's reaction a concentrated solution of nickel sulphate saturated with ammonia turns yellow or blue with proteid matters, the blue changing to orange yellow on adding caustic potash. Reichel and Mikosch's method is to add to the substance under examination about twenty drops of an alcoholic solution of benzaldehyde, followed by an excess of sulphuric acid diluted with its own water, and containing traces of ferric sulphate. An intense blue coloration is thus imparted to albuminoids. Absolute alcohol is recommended as the best coagulating medium; and the xanthoproteic reaction is said to be very good for sieve tubes, in place of eosine. It is stated also that the albuminoid reactions of sieve tubes are not always very intense, and that a large quantity of proteid substances occurs in the growing points of roots and in the laticiferous tubes of various plants, notably *Carica papaya.*—*Pharm. Jour. Trans.*, 1894, 71; from *Journ de Pharm. d'Anvers*, 1., 209.

Acids of Beeswax. — T. Marie describes a method for the extraction of the free acids in beeswax, which gives good results if it is applied to mixtures of acids, so long as bodies belonging to other organic series are absent. Beeswax, when treated by boiling alcohol, yields to this solvent not only the free acids present, but also hydrocarbons, oleic compounds, coloring matters and myricin, which are difficult to separate properly. The method adopted for obtaining the acids free from these other substances is as follows: After the wax has been treated by the boiling alcohol the greater part of the latter is subsequently distilled. The cooled and crystalline residue is then squeezed to separate oleic compounds and coloring matters, after which the solid cake is melted, washed repeatedly with boiling water and further decolorized by charcoal and filtration through paper. The slightly yellow mass thus obtained melts at 70°. This, after being heated with potash and lime, is cooled, powdered and mixed with a large quantity of water, which is then heated to ebulition. Dilute hydrochloric acid is then added to neutralize the alkali and the free acids of the wax combine with the soluble calcium salts in the mixture to form insoluble compounds. The latter are separated, washed and dried, then treated with boiling alcohol and benzin to remove neutral substances, and decomposed. The acids thus isolated, after crystalization from alcohol, which removes a small quantity of palmitic acid formed from the myricin, melt at 79°-80°. By further treatment, with methylic alcohol, cerotic acid is dissolved out, ond on crystallizing is found to melt at 76°, the melting point being raised to 77°5 after a single crystallization from ethylic alcohol. The residue melts at 78°, and contains melissic acid, described as identical with that extracted from carnauba wax by Story Maskelyne and Pieverling. Crude cerotic acid is said to contain from 30 to 40 per cent. of analogous acids, and Marie announced his intention of further studying the pure compound and its derivatives.—*Pharm. Jour. Trans.*, 1894, 172, from *Comp. rend.*, cxix., 428.

Essence of Pelargonium.—Barbier and Bouveault assert that Bertram and Gildmeister are wrong in concluding that the lemonol of *Andropogon schœnanthus*, the alcohol of essence of pelargonium, and the rhodinol of otto of rose are identical. The alcohol provisionally termed the rhodinol of pelargonium possesses a strong odor of roses, has a density of 0.8866, and is associated with another compound, greatly resembling licareol. Altogether, it is found that the essence of pelargonium contains six different substances, the rhodinol-like alcohol predominating. The constitution of this alcohol is considered in a subsequent paper by the same authors.–*Comp. rend.*, cxix., 281 and 337 *P. J. T.*

Sensitive Copper Reaction. — P. Sabatier, whilst experimenting with the bromide and other compounds of copper, noted that a very intense coloration was produced on dissolving a little of the bromide in concentrated hydrobromic acid. The color is due to the formation of a purple hydrated compound, and he bases on its formation a very sensitive test for copper salts, since it is quite appreciable when a single drop of an aqueous solution of a copper salt, containing one part of copper in 30,000, is added to a cubic centimetre of colorless, concentrated hydrobromic acid. The delicacy of the reaction is somewhat impaired by the presence of free bromine, the color of which masks the lilac tint, but on healing the liquid to ebullition the latter becomes apparent as the bromine is driven off. If desired the concentrated hydrobromic acid may be replaced by potassium bromide in a saturated solution of orthophosphoric acid. On adding a drop of a copper solution to this, heating to 100°, and then cooling, the coloration is distinctly visible, its intensity depending on the proportion of copper present.—*Pharm. Jour. Trans*, 1894, 172; *Bull. de la Soc. Chim. de Paris* [3], xi., 683.

Iodides of Mercury.—Berthelot refers to the two isomeric forms of iodide of mercury—red and yellow—and remarks that without doubt, on the condensation of the vapor of the compound, the yellow iodide is directly formed, but contact with the least trace of the red iodide suffices for the conversion of the whole into the more permanent state. It must be considered, therefore, that the yellow iodide is only stable at the temperature at which the vapor condenses. On cooling to the ordinary temperature it becomes so unstable that contact with the normal crystals is sufficient to determine the transformation of the yellow into the red compound.—*Pharm. Jour. Trans.*, 1894, 172; *Bull. de la Soc. Chim. de Paris* [3], xi., 748.

Citric Acid in Milk.—L. Vaudin shows that citric acid exists in cows' milk in the form of an alkaline citrate, which serves to keep in solution the calcium phosphate ; and that the alkaline citrates and phosphates and calcium phosphate are present in the liquid in proportions which are relatively definite. Cows' milk contains from 1.0 to 1.5 Gm. of citric acid per litre, and mares' milk from 60 to 80 Cgm. per litre. Vaudin is of opinion that the acid is formed in the mammary gland at the expense of the lactose, and that the citrogenic function of the gland, variable in different species, assures the partial solubility of the calcium phosphate contained in the milk.—(*Ibid.*); *Ann. de l'inst. Pasteur*, viii., 502.

Starch of Cacao.—E. S. Bastin finds that the starch grains in different varieties of cacao—Ariba, Tabasco, Surinam, Bahia, Machalle, Grenada, Trinidad, Maracaybo, Java, and Caracas—are essentially alike, and agree with the following general description : — Grains spherical, or nearly so, when simple ; hilum central, usually quite distinct and sometimes fissured ; fissure simple and straight, or curved, angular, or stellate ; one or two usually distinct lines about the hilum, but no other marks on the grain, some of which may be compound Though closely resembling each other, the starches of the cacaos are quite unlike those of drugs generally, and sufficiently characteristic to be distinguished from starches added as adulterants. The grains seem to vary from 1μ to 10μ in diameter and they show a structure that is very distinct for such minute structures. —*Amer. Journ. Pharm.*, 1894, 369.

Tussol.—The preparation introduced under this name as a remedy for coughs is a saline compound of antipyrine and mandelic acid ($C_8H_8O_3$). It is stated to be very much more effectual than antipyrine. For children under one year the dose is from one third of a grain to a grain and a half two or three times a day ; for children over four years, seven grains several times in the day.—*Pharm Centralh*,, 1894, 532.

Purity of Flour and Yeast.—M. Rondelet proposes to examine flour and yeast for mineral matters by a process akin to those employed in microbiology. A little of the suspected material is placed on a slide, and one or two drops of an aqueous solution of anilin and alcoholic fuchsin solution are then added, and followed by an equal quantity of tincture of iodine and distilled water. On applying a cover glass and examining, the cellulose appears reddish-brown and starchy matter black ; but any mineral matter present will be yellowish, like the background of the preparation. The addition of a drop of water clears the preparation, crystals appearing with their normal tint and sharply defined. It is stated that in less than five minutes it is thus possible to decide whether flour contains plaster, barium sulphate, china clay, etc.-*Journ. de Pharm. d'Anvers*, l., 363 (*P.J. T*)

Filtration of Water.—P. Miquel publishes the results of a series of experiments bearing upon the sterilization of water by filtration, performed with a modified arrangement of the Chamberland bougie. The space between the bougie and its enclosing case was filled with coarse sand, and before the water was admitted it was passed through a cylinder, 0.10 M. long, which contained a layer of fine sand, 0.07 M. thick, and another of animal charcoal, 0.03 M. thick. The water was sterilized at 100° C. prior to the experiments, and for purposes of comparison a second Chamberland bougies was used in the ordinary way, the filtered products from the two being tested side by side. Whilst the filter enveloped in sand delivered water showing no trace of bacteria until the twelfth day, when 60 per C.c. were present, that passing through the other was found to contain 20 per C.c. on the second day, and the number increased rapidly subsequently. Again, whilst the flow of water from the naked bougie was reduced to half by the fifth day, that from the sand-enclosed one had increased on the fifteenth day to double what it was on the first.—*Journ. de Pharm. et de chim.*, [5], 1894, 129. (*P. J. Tr.*)

Carissa Ovata.—A variety of this somewhat rare plant (var. *stolonifera*, F. M. Bailey) has been subjected to examination by T. L. Bancroft, of Brisbane. He has extracted from the plant a crystalline principle which is very bitter, and is apparently a glucoside. The crystals are very soluble in water, less so in dilute spirit, slightly soluble in absolute alcohol, and insoluble in ether or chloroform. Strong sulphuric acid gives no coloration with the crystals, but ammonia gives a yellow color. Auric chloride and tannin give slight precipitates with the solution of the crystals, but mercuric chloride gives none, nor does potassio-iodide of mercury. The crystals are deliquescent, and when exposed in a thin layer to the air for a few days they assume a green color. They reduce an alkaline solution of cupric oxide. At first Bancroft suspected that this principle might be identical with ouabain, since the genus *Carissa* is closely allied to *Acokanthera*, and the alcoholic extract of the bark rapidly killed frogs when subcutaneously injected, the heart stopping in systole and the muscles being pale and paralyzed. He now believes, however, that it is quite distinct chemically. Bancroft suggests that the allied species, *C. xylopicron*, which is used in the urinary organs, might be worth a trial in Europe, the Brisbane plant being scarce.—*Pharm. Jour. Tran.*, 1894, 253.

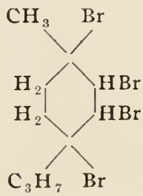
Thermophilic Bacteria. — A. Macfayden and F. R. Blaxall have made experiments with a view to studying the range of temperature at which it is possible for bacteria to grow. After inoculating agar-agar with garden soil, they found that an abundant growth of bacteria was obtained at the comparatively high temperature of 60°-65°C. To such organisms the term "thermophilic bacteria" is applied. They are widely distributed in nature, being found in fæces sewage, Thames water and mud, surface soil, and soil at a depth of five feet. Dust from the streets invariably contains them, and they are also present in sea water. In fact, they may almost be termed ubiquitous. About twenty different forms of thermophilic bacilli, have been isolated all, with one exception, being spore-bearing organisms. They will not grow at or below blood heat. Some liquefied gelatin, others did not. A number of them curdled milk, and one converted starch into sugar. In broth and agar cultures putrefactive decomposition took place, iodol and sulphuretted hydrogen being produced. The organisms also produced an active decomposition of meat and blood alumin, and several of them produced a fermentation of cellulose. They are said to exercise perfectly all the functions common to saprophytic organisms at 60° to 65° C., that is to say, at a temperature which is usually fatal to the life of cell protoplasm.—*British Med. Journ.*, 1894, 644.

Novel Hydrocarbon in Fir Tar—A. Renard describes a novel hydrocarbon occurring amongst the products of distillation of fir tar, which is probably a member of the aromatic series. When purified it is a colorless liquid, boiling at 254°–257°. Its density at 0°C. equals 0.9419, its refractive index is 1.507, and it is without action on polarized light. Its analysis and vapor density indicate its formula as $C_{14}H_{22}$. Exposed to air it becomes brown in color, but hydrochloric acid does not affect it. With bromine it forms colorless crystals of a tetrabromide derivative, $C_{14}H_{18}Br_4$, and an unstable bibromide, $C_{14}H_{22}Br_2$, may also be prepared. A nitro-derivative, $C_{13}H_{21}NO_2$, is formed by the action of fuming nitric acid upon an acetic solution of the hydrocarbon, and a sulphonic derivative by the action of sulphuric acid. The latter when separated, distilled, and otherwise purified, yields about 15 to 20 per cent. of a saturated hydrocarbon that boils at about 250°–253°, corresponds to the formula $C_{14}H_{26}$, and is unaffected by the strongest acids. The sulphonic acid remaining in solution may be separated by precipitating it as an ammoniacal salt, which is very soluble in water. The acid also forms an insoluble barium salt $(C_{14}H_{21}SO_4)_2Ba$. The last reaction noted of the hydrocarbon, $C_{14}H_{22}$ is the very marked blue coloration produced on treating it with a mixture of sulphuric acid and alcohol. This, according to Maquenne, is characteristic of the aromatic hydrides. The partial transformation of the new compound, when treated with sulphuric acid, into a saturated hydrocarbon may be compared with the transformation of heptinene, C_7H_{12}, into toluene hexahydride, and it may possibly be correct to regard it as bi-heptinyl, $C_7H_{11}—C_7H_{11}$, or bi-tolyl octo-hydride $(H_4—C_7H_7)—C_7H_7—H_4)$. This formula also accords with the transformation of the compound into a saturated hydrocarbon or bi-tolyl dodecahydride $(H_6—C_7H_7)—(C_7H_7—H_6)$, by fixation of four atoms of hydrogen.—*Pharm. Jour. Trans.*, 1894, 354; *Comp. rend.*, cxix., 625.

Constitution of Limonene. — Wallach has determined the constitution of limonene from the following considerations :—Limonene reacts with bromine, forming limonene tetrabromide which is decomposed by sodium methylate thus :—

$$C_{10}H_{16}Br_4+3NaOCH_3=C_{10}H_{14}BrOCH_3 +3NaBr+2CH_3OH.$$

The product can be made to yield the methyl ether of carvol by treatment with silver acetate and acetic acid, and by treatment with hydrobromic acid dipentene tetrabromide results. Since carvol and dipentene can be obtained from limonene tetrabromide, that compound must have one of the three following formulæ :—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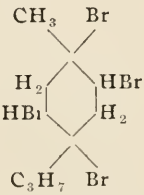
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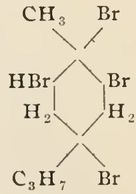
III.

The third is considered an unlikely configuration from analogy. By acting on I. with sodium methylate, no product could result which would yield carvol or dipentene derivatives on treatment with silver acetate or hydrobromic acid. But II. would yield the ether, and is capable of forming carvol ether and dipentene tetrabromide. Now terpineol yields a tribromide of known composition, and the three bromine atoms in its formula are in the same position as those presupposed for limonene tetrabromide, whilst the compound yields carvol ether by proper treatment, identical with carvol ether obtained from limonene. Thus the formulæ for limonene tetrabromide and limonene are confirmed.—*Ann. der Chem.* 281, p. 127. (*P. J. Tr*)

Localization of Alkaloids in Plants.—In a paper in the *Bulletin* of the Belgian Microscopical Society (1894), M. Clautriau describes the mode of distribution of the alkaloids in a variety of plants, which he arranges under five types, viz.:—(1) In a layer of cells lying between the endosperm and the true testa (*Atropa belladonna*, *Datura stramonium*, *Hyoscyamus niger*); (2) in two layers, especially in the outer one, between the endosperm and the pericarp; also, to a smaller extent, in the epiderm, and in the cells which accompany the vascular bundles (*Conium maculatum*); (3) in the endosperm, especially in its peripheral cells (*Aconitum napellus*, *Delphinium staphisagria*); (4) in all the cells of the endosperm, and to a smaller extent in those of the embryo (*Strychnos nux-vomica*); (5) apparently in the cotyledons and plumules (*Lupinus albus*). The alkaloids take no active part in germination, but are formed in the seedling by decomposition of the albuminoids. In *Papaver somniferum* the amount of alkaloids decreases as the seeds ripen, and this is accompanied by an elimination of nitrogen. Their chief function here appears to be to protect the plant from consumption by animals.—*Pharm. Jour. Trans.*, 1894, 355.

Formation and Function of Tannins.—In a paper in *Programm der Realschule vor dem Holstenthore* in Hamburg, G. Mielke traces the formation of tannins in plants through phenols, phenol-alcohols, and aldehydes; they occur, in chemical combination with sugar, as glucosides, and play an important part in vegetable economy, since they are the indispensable materials for the production of lignifying substances. They are never formed out of albuminoids, and are not nutritive substances; they can take part in metabolism only when they revert to their previous stages by absorption of water. Resins and essential oils are probably the final results of the metamorphosis of tannins.—*Pharm. Jour. Trans.*, 1894, 355.

Action of Light on Diastase.—J. R. Green states that the results of the experiments that have so far been conducted show that light, whether solar or electric, exercises a destructive effect upon diastase, which continues after the exposure to light is discontinued, the exposed solution gradually becoming weaker until it possesses no diastasic power. This deleterious influence is confined to the rays of the violet end of the spectrum, the others being slightly favorable rather than destructive. Part of the solution so found to be affected by light-rays was kept in darkness and maintained its diastasic power unimpaired for more than a month, by which time the exposed portion of the solution, which had also been kept in darkness after an exposure of from two to eleven days, possessed no power to act upon starch. The experiments were performed on an extract of malt prepared by infusing ground malt with water or salt solution, and the results would seem to indicate the desirability of carefully protecting malt extracts from the action of light. A comparison of the diastasic power of fresh malt extract with that of similar material exposed in the pharmacy for varying periods suggests itself as an investigation of direct pharmaceutical and medical interest. At the same time it yet remains to be proved that the diastase is the chief or only active agent in malt extract. The coloring matter of the barley-husk has been proved to act as a screen which preserves the diastase from the destructive effect of light, whether it is dissolved in the extract made from malted barley or used separately as a screen placed before the cells in which exposure is made.—*Pharm. Jour. Trans.*, 1894, 355, from *Annals of Botany.*

Wheat and Rye Starch.—E. Guenez points out that these starches possess very similar characters, and it is difficult at times to say decidedly that a given sample consists of one rather than the other. To distinguish the two kinds he recommends that a little of the material be mounted in water for examination with the microscope. The wheat starch will then be seen to contain comparatively few split grains, which possess an isolated fracture situated near the edge or proceeding from the centre to the circumference. In the case of rye starch the split grains are more numerous and possess a star-shaped fracture with three or four branches, apparently originating in the centre of the grain and rarely reaching the grain. Some grains may also be found which have only a linear crack, but this will be larger in the centre of the grain than towards the edges, just the reverse of what occurs in wheat.—*Bull. de pharm. de Bordeaux*, xxxiv., 289. (*P. J. Tr.*)

Tinctures and Tincture Making.—(H W. Jones,)—The Pharmacopœial (B. P.) tinctures are made by several methods, the bulk being produced by a combination of maceration, percolation and pressure. By those means it was intended to fully exhaust the drugs, and present the soluble constituents in a definite volume of liquid. The purpose was answered, but with more complex working than necessary. In the original edition of the 1885 Pharm., Tinct. Zingib. fort. was directed to be prepared by percolation, but in the "Additions," subsequently published, three others were ordered to be so made. The general instructions for Tinct. Hamamelidis and Tinct. Hydrastis were perfect, and it was to be taken as a sign of the times that the more modern method was recognized. That the bulk of the tinctures of the Pharmacopœia could be so prepared would not be controverted. The three essential points to be attended to were: (1) To damp as quickly as possible to avoid loss, and to store in a closed vessel during maceration; (2) To properly pack the moistened ingredients so as to avoid air-spaces; and (3) To keep the surface just covered with the menstruum during the entire process. Some operators packed straightway into the percolation after damping, but in most cases, at least, the author found it advisable to store for 24 hours in a separate closed vessel, and to finally mix well together, adding a little more menstruum if really necessary before the final packing. The percolator was generally advised to be of a conical shape, but operating on a large scale, with a considerable amount of material, a vessel of that form had the disadvantage of giving a large surface to the upper layer of spirit, and consequent liability to loss from evaporation. Whatever form of percolator was adopted, it was a distinct advantage to have the bottom part of it tapering. For the author's own part he preferred a tap, which could be closed or opened to a simple tube; and showed a model of a percolator which he had devised. This consisted of an upright, somewhat narrow, metallic vessel, with a funnel shaped bottom part provided with a tap having a thread-screw on the outer part, so that tubes of various lengths could be screwed on or off. The special feature of the perculator being a band of metal around the bottom part deep enough to enclose the tap when the tubes were removed. By means of the band the apparatus would stand erect on any plane surface. In use the percolators were arranged on a stout bench with diamond-shaped holes, through which the hand could be passed to turn on or off the taps or fix the tubes. In commenting on various tinctures, it was considered that with Tinct. Camph. Co., the opium could advantageously be replaced by a corresponding amount of Tinct. Opii. as advocated by Squire. In the case of Tinct. Cardam. Co., the author said he would venture to suggest that the variety of raisins known as "sultanas" might be used, as they contained no stones, As was well-known, the B. P. instructions gave a product of more than 80 ozs. without making up. It was a tincture which could be prepared by percolation if the various ingredients were well mixed together. It had been suggested to prepare Tinct. Cascarillæ by means of a weaker spirit, but Groves found that even with proof spirit it was nothing like so good as when the spirit was slightly stronger. Tinct. Guaiaci ammon. would be better prepared with a stronger menstruum, Wright's proportions of 18 ozs. S. V. R. and 2 ozs. Liq. Ammon. Fort. giving 82 grs. per oz. of solids as against 62 grains for the present spirit of ammonia. Tinct. Myrrhæ was an example of a tincture which could not be prepared by percolation without previous maceration. Tinct. Podophylli should not be fluorescent. The author had recently seen a tincture that was strongly so; and he had pointed out some years ago that that result was due to the employment of resin precipitated in alum water instead of by the B. P. method. Heat was necessary in making Tinct. Quininæ, and the suggestion of Lunan as to the substitution of carbonate of ammonia for the hydrate was worthy of the attention of the pharmaceutical authorities, since the product formed a clear solution with 13 parts of distilled water, whereas the present tincture required 26 parts.

However made, tincture marcs retained a decided amount of spirit. By pressure, a certain proportion could be obtained; but a relatively large quantity was left behind. He had found, for example, that a batch of 60 gals. of Tinct. Opii. would leave something like 2 gals. in the marc.; and a similar amount of spirit would be retained by marcs resulting from 16 gals. of Tinct Cinchon.Co., Tinct. Hyoscyami and Tinct. Sennæ. In no case was it desirable to wash out that spirit with water if it were intended to form a part of the finished product. On the whole, he preferred to percolate right through with the proper menstruum till the full bulk was obtained, and to recover the spirit from the marc by distillation in a large still, with sufficient water to prevent the formation of clots of material. To wash certain marcs with water took considerable time, during which the mass was apt to become mouldy or decompose.

In reference to standardized tinctures, there was a definite statement as to the alkaloidal strength of both Tinct. Opii., and Tinct. Nuc Vomicæ in the Pharmacopœia. Experience had shown that the menstruum did not exhaust the Opium, but by taking a tincture made with a strong opium and one made with a B. P. drug, the percentage required could be obtained by mixing the two in the proportions indicated by an assay. As to the method of assaying Tinct. Opii, he would prefer to follow the B. P. method as closely as possible rather than attempt washing out with acetic ether and chloroform. Familiarity with Tinct. Nuc. Vomicæ had not strengthened the view that the use of extract was the best method of preparing it. Similarly the employment of extracts of other drugs was not to be advocated. The subject had received particular attention at the 1893 meeting of the British Pharmaceutical Conference, and had been condemned. A tincture was supposed to contain the constituents of the drugs, as they existed in the drugs themselves, unaltered by heat. Gerrard's statement had not been controverted, that with atropine, a solution boiled with alcohol even for ten minutes lost 50 per cent. of its alkaloidal power. At present there was no direct authority for standardizing generally, but there was such a demand for standardized preparations, and the result was that, in the absence of official methods, each wholesale house or each pharmacist, was left to fix the standards, so that uniformity was not likely to exist. Something was wanted more than mere statements of percentages: the methods of analysis should be well defined. Meyer's solution was out of date, and it was hardly settled whether volumetric methods or gravimetric processes should be followed; or even in some cases, as that of aconite, if the test should not be physiological. Messrs. Wright and Farr stood pre eminent amongst British workers, and had for several years been publishing the most important results, and he thought their methods of assay might well be adopted. Various standards had been suggested, but in most cases of average good drugs, but the author of the paper had met with a practical difficulty which required some consideration. It was, that it was not difficult to obtain drugs frequently above any average that might be fixed, and the question arose—Should we use less to produce a preparation of "average" strength? He thought not, as the Pharmacopœia distinctly ordered a definite weight to be taken, so that for the present, at least, he ventured to suggest that the standard adopted should be that approximating to the highest percentage. Concentrated tinctures might receive some attention at their hands. They were more properly described as fluid extracts, and experience had shown that fluid extracts prepared with proof spirit, at least, were somewhat unstable. So that it might be asked what strength of spirit should be used for exhaustion. As an example, they had Tinct. Catechu, and to produce a concentrated tincture four times the ordinary strength, it was required to dissolve or exhaust 10 ounces of catechu, with sufficient proof spirit to produce one pint of finished liquid. Could a permanent and satisfactory preparation be so made. Again, capsicum formed a tincture in which an excess of spirit might appear to be used for exhaustion, but the dose being small, it was probably better for dispensing purposes than a stronger tincture given in smaller amounts. If concentrated tinctures were used, let them be employed for special purposes rather than for the preparation of the official tinctures.—*Brit. and Col. Drug*, 1894, 489.

MANUFACTURE OF ESSENTIAL OILS.

The essential oil industry has derived considerable advantages from the progress in the chemical investigation of essential oils. The term which used often to be applied to the supposed workmanlike manufacture of an essential oil, that it had been turned out according to the rules of the art (*lege artis*) is now no longer suitable. A mode of manufacture based upon intelligent principles has replaced rule-of-thumb work; craftmanship has been ousted by science, which, in teaching us the physical and chemical properties of an oil, indicates at the same time ways and means of improving its manufacture. Nowadays each raw material requires its own method of distillation, every crude oil its own special mode of rectification. The processes of preparing similar oils are sometimes altogether different in principle, while in other cases slight deviations in method are sufficient to bring about important improvements in the manufacture. The fact that freshly distilled oils have a disagreeable subsidiary odor, the so-called "still smell," was formerly looked upon as quite a matter of course, but it is now known to indicate either want of knowledge in the process of distillation or gross carelessness. The fresher the oil, the purer should be its odor and taste. Freshly rectified oil of caraway should smell just as aromatic and agreeable as the freshly crushed seed. If, as a result of defective distillation, an oil has once acquired the well-known mouldy sharp odor, no amount of exposure of the oil to the air will remove this entirely; but, on the other hand, the oil, if kept in this condition, all the more rapidly falls a victim to the fate of almost all essential oils, viz., resinification or other decomposition, without having ever been really pure in odor or taste. —*Schimmel's Bericht*, 1894.

THE COLLEGE OF PHARMACY OF THE CITY OF NEW YORK.

By Prof. H. H. Rusby, M. D.

(Continued from March issue.)

Articles of the first class are chiefly purchased from the wholesale druggist. Nevertheless, the pharmacist is not properly qualified to escape with readiness the results of deception and error unless he has a fair knowledge of the original sources of supply. Indeed, in the case of a number of articles the best results require that the pharmacist should seek his own crude materials in a state of nature. Owing to the probability that a number of other vegetable drugs are more efficacious when used in the fresh condition, a still further knowledge of this character is likely to be required from the pharmacist in the future. The principal portion of his knowledge of *materia medica*, however, will always be restricted to the identification and estimation of the crude materials as found in the warehouses or sample rooms of the wholesale druggist. In making such selection he is obliged to depend in the case of all but three of the 175 drugs of this class, upon his knowledge of botany. Great efforts have been made within the past decade to discover chemical processes by which botany might be relieved of this responsibility, and at the same time greater accurancy be attained in the estimation of vegetable drugs. Up to the present time, however, a success satisfactory to the Pharmacopœia Committee has been attainéd only in the case of the three drugs, opium, cinchona and nux vomica. For the entire remainder, the application of botanical knowledge is the only means at the command of the pharmacist. Botany so applied constitutes the chief portion of the branch of study known as pharmacognosy. Its requirements of the student are most exacting. As there is no part of the plant which does not in one or more cases enter into the *materia medica*, it follows that the student's knowledge of vegetable structure must extend to every one of the plant organs. Up to the present time the Pharmacopœia has assumed that all these drugs are to be selected by the pharmacist in a crude condition, so that it has required of him only a knowledge of the organs *in situ*, or entire. The fact, however, that fully seventy-five per cent. of these products are purchased in a powdered or more or less comminuted condition particularly—and more especially from foreign sources,—that adulteration is to be looked for, has called for an increasing resort to the aid of the compound microscope and an increasing refinement and complexity in the observations required.

The proper preservation and storage of his materials is a matter of no small consequence as enabling the pharmacist to prevent destruction or deterioration, accidental reactions between the article stored and the occurrence of dangerous errors.

The same will apply to prescription reading. Those who have not inquired into the matter would find it difficult to realize what almost insurmountable difficulties are presented to the young pharmacist in the reading of prescriptions. Illegible writing, misplacing of symbols, ambiguous abbreviations, incorrect and misleading spelling, and bad Latin constitute only a portion. A good knowledge of Latin is, of course, one of the requisites of the pharmaceutical education ; but even this will not always enable the pharmacist to correctly interpret instructions which themselves contain errors. It is in point of fact simply impossible for a pharmacy course to complete the student's knowlege of prescription reading. Long experience in drug store practice is the only means at command.

Alumni Association.

THE pharmaceutical meeting of the Alumni Association was held March 13, '95. Despite the very disagreeable weather, quite a large audience gathered to hear the very interesting lecture delivered by Mr. Chas. E. Pellew. E M, who is well known by all the recent graduates and present students of the college; this fact, probably accounting for the large audience. The classes of '93 and '94 were both well represented; the class of '94 especicially distinguishing itself by the large number present, prominent among whom was Nelson S. Kirk, who supplies THE ALUMNI JOURNAL with very interesting and valuable class matter in each monthly issue, thereby stimulating the interest of the students in behalf of the Alumni Association. The College of Physicians and Surgeons, was also very well represented, by students, quite a few of whom brought their lady friends.

The lecture proved very interesting indeed, and the audience were well repaid for "braving the elements" to hear the jovial son-in-law of Prof. Chas. F. Chandler. Not enough members of the executive board of the Association being present to transact business, no executive board meeting could be held.

Respectfully submitted,
W. A. HOBURG, JR., Sec'y.

'93 NOTES.

WHO does not remember Banks H. Bouton, who could smile so sweetly at all the pretty girls and receive smiles in return, better than any other man in our class? I met him in New Rochelle, where he is at present managing Hafford's pharmacy. Congratulations upon his engagement to Miss Edith Le Fevre, are due to him, and I'm sure that all who know him will heartily wish him all happiness and luck for his future.

APROPOS of engagements and marriages. A good number of our '93 seem to have been stricken with it.

Harry Heller is married, Zwigly, ditto, so is Kipp, from Sing Sing. Julius Tannenbaum announces his engagement to Miss R. J. Goodman. He has reformed at last and is selling plasters for it, and is thus getting a "pull."

ONE of '93 boys has "Pharmaceutical Chemist" on his cards. Would Chemical Pharmacist do as well?

WILL members of '93 communicate with J. Tannenbuam, to keep up the '93 column, and help make it to be anxiously looked for?

JULIUS TANNENBAUM, Reporter,
74 East 105th St., City.

'94 NOTES.

ONE of the most interesting as well as successful lectures of the Alumni series was that delivered by Dr. Pellew on Wednesday evening, March 13th. It would seem that by the manner in which he officiated the subject was one of his especial liking.

He began with accounts both weird and startling of famous poisoners before Christ, passing up through Socrates' time. He laid particular stress on Lucuster, a noted preparer of poisonous draughts, who was employed in this capacity by her emperor. Of modern cases those of Dr. Buchanan and Mrs. Maybrick were briefly considered until the Carlyle Harris case was reached. Here the doctor dwelt considerable time enumerating episodes of this young man who was under his tuition at College both before and after the fatal dose was given.

Arsenic in some form being the predominating poison, the Marsh apparatus in working order was on exhibition, and how familiar it looked! The anticipation of the audience, large for such a stormy night were fully realized. The delegation from '94 was an evidence of the Doctor's popularity. The roll of honor was headed by ex-Secretary Linnig, then came Messrs. Kellar, Dawson, Kussey, Race, Krueder, Col. Wade, Clarke, Auerbach, Burger, Erb, Geisler, Gruber, Hutchinson, Loveland, Van Tassell and Stoerzer, a total of 18 or nearly 15 per cent.

of our class. This looks as though enthusiasm was gaining a very promising outlook for the Alumni Association whose ranks have already been largely swelled by our class.

FORMERLY imbued with the spirit of athletic sports. Col. Wade and B. Edgar Dawson were among the first to join the New Manhattan Athletic Club which has recently opened under auspicious circumstances. A day's labor of fifteen hours does not prevent them from taking their favorite course which usually consists of gymnastic exercise, a few miles' spin around the track followed by a plunge in one of the largest and finest tanks in the country, and finally a rub down several times a week, but to the contrary this "heroic treatment" has put them in fine condition. As guests of these gentlemen several of their classmates have recently enjoyed the hospitality of the club

JOE KUSSEY, our able Valedictorian, still resides in Newark, N. J., and may be found any day practicing the profession in H. M. O'Neil's store which formerly belonged to the Crescent Drug Co. and is one of Newark's largest pharmacies. Joe has not forgotten his old associates and expresses regret in not seeing more of the familiar faces. He speaks about eventually taking up either medicine or dentistry.

AT the reception of the Pharmaceutical Club I was particularly impressed with the popularity of several of our boys with the fair sex. Dawson was overwhelmed with "Beauts," Race was exceedingly gallant to the handsome cashier of a prominent drug firm in this city, while Clarke said, as he ran his fingers through that luxuriant beard of his "no thanks I'll not indulge tonight." Upon close observance I noticed he was eyeing a Deutsche Apotheker's daughter and I dare say he envied her "steady."

MUST not the lectures be interesting when a man will come from Plainfield, N. J., to attend them? Well, that is just what one of our loyal classmates (John P. Hutchinson) does and furthermore intends to do. He has been with J. H. Leggett since last September and is thriving beautifully on Jersey's balmy air as is also Gerard who is manager for Frank E. Hatch, of Rutherford, N. J.

THINK THIS OVER, on Wednesday evening, April 10th, a lecture will be given by A. Ernest Gallant. It will be the last of this season's series. You are in a position to attend. Will you do it?

NELSON S. KIRK, Ph. G.,
9 E. 59th st.

Senior Class Notes.

AT a meeting held Wednesday evening, Feb. 20, 1895, the following matters were regularly considered:

Valedictorian.—Chairman reported that the time specified for receiving names had expired, and that up to the present time eleven names had been handed in. He requested that the committee be relieved from further duty, and moved that final action be taken on the matter at a meeting to be held two weeks from date. Committee discharged and motion carried as follows:

Moved that the candidate receiving the highest number of votes be chosen for the honor; that the one having the next highest number be selected as substitute; that each contestant appear before the class with some prepared speech or selection.

Revision of Constitution.—Chairman reported that the committee had completed its work, in accordance with instructions; that Constitution as revised was respectfully submitted to the President, and requested that committee be discharged.

Moved, seconded and carried. that committee be discharged, and that Constitution be read by the Secretary and be voted on by sections. This was done, and Constitution accepted as a whole.

Executive Committee.—Moved, seconded and carried, that in order to be in accord with the Constitution the previous Executive Committee be discharged and that a new one be appointed to consist of ten members, as follows, viz.: President, Vice-President, Secretary and Treasurer of the class to act as *ex-officio*, and that three (3) members be chosen from each of the two sections.

The following gentlemen were thereupon chosen to constitute an Executive Committee: Jesse I. Bailey, President; Harry B. Ferguson Vice-President; Thomas P. Heffley, Secretary; James B. Carter, Treasurer. Section 1—Francis P. Bannon, Daniel E. Brown, George E. Manville. Section 2—Frank B. Beh, William M. Kerr, Frank L. Chambers.

Class Photograph.—Chairman of this committee read the various estimates submitted by different photographers, and asked that they receive further instructions.

On motion, seconded and carried, it was decided that the committee place upon the bulletin board the complete list, with full details, before any action be taken.

Class Flag.—Chairman of the committee reported that as its duties were practically ended, it be relieved. It was accordingly discharged with thanks.

Class Pin.—After discussion on this matter, on motion. seconded and carried, the award was made to C. B. Braxmar, who guaranteed that the workmanship and quality would be in every way equal to the original design submitted. Price per pin to be $2.50.

On motion meeting adjourned.

T. P. HEFFLEY, Sec'y.

A MEETING was held Wednesday evening, March 6. After calling to order, President Bailey stated the character and importance of the business for consideration.

The following matters came up before the class, respectively, by motion. were seconded, voted upcn and carried :

Commencement.—It was decided that the Valedictorian should make his address at the Commencement exercises instead of at the class supper.

Valedictorian.—It was decided at the previous meeting that the candidate receiving the highest number of votes be chosen for this honor ; that the one receiving the next highest number be selected as substitute in the event of any unforeseen or unexpected circumstacne preventing the other party from fulfilling the duty ; and that each contestant appear before the meeting with some prepared speech or selection. In accordance therewith addresses and declamations were rendered by four of the candidates.

Motion was then made, seconded and carried that the candidates be voted for by ballot, and Messrs. H. B. Ferguson and F. L. Flick were appointed to act as tellers. The result was the choice of David M. Wells as Valedictorian, and of Frank B. Beh as substitute.

Motion was made and carried that the election be made unanimous, which was done, and at the call of the meeting both of the gentlemen responded pleasantly and fittingly.

Class Poet—On motion, seconded and carried, Mr. Francis P. Bannon was elected as Poet for Class of '95.

Class Historian—On motion, seconded and carried, Mr. Frank L. Chambers was elected to fill this office.

Class Prophet.—On motion, seconded and carried, Mr. William M. Kerr was chosen to act in this capacity.

Adjournment, by regular motion.

THOMAS P. HEFFLEY, Sec'y.

VISIONS OF THE PAST.

Dedicated to the Class of '95, N. Y. C. P.

There are times when our thoughts will wander
Back to our college days ;
And lead us through scenes and enchantments
That live in our hearts always.

And we dream of our bygone pleasures,
Heedless of sorrow and pain;
We sigh when we think of the present,
And wish we were boys again.

Thus we sleep on forever thinking,
Life is a rippling stream ;
Which is bearing us onward forever,
In the sweetest of measures—a dream.

—FRANCIS R. SHEAHAN, Class of '95.

Attention is directed to the students of the Senior Class to the article on Alkaloids, Alkaloidal Salts and Neutral Principles arranged in an excellent form for study by A. N. Doerschuk and published as a supplement to the *National Druggist*, for March, 1895.—EDITOR.

CONSTITUTION OF THE CLASS OF '95 OF THE COLLEGE OF PHARMACY OF THE CITY OF NEW YORK.

ARTICLE I.

NAME AND MOTTO.

SECTION 1. This Class shall be called the "Class of '95 of the College of Pharmacy of the City of New York."

SEC. 2. The motto of this Class shall be "*Entre nous*" (Between ourselves).

ARTICLE II.

MEMBERSHIP.

SECTION 1. This Class shall be composed of Active and Honorary Members.

SEC. 2. Active Members shall consist exclusively of Senior students of the Class of '95.

SEC. 3. Honorary Members shall consist of the Faculty of the College of Pharmacy of the City of New York, *ex-officio*. They shall be entitled to all the privileges of the Active Members.

ARTICLE III.

OFFICERS.

SECTION 1. The officers of this Society shall consist of a President, Vice-President, Recording Secretary and a Treasurer, and officers so elected by the class shall be chosen exclusively from the Active Members of the different sections of the Class of '95.

SEC. 2. It shall be the duty of the President to preside at all meetings of the Class.

SEC. 3. In the absence of the President, the Vice-President shall perform the duties incumbent upon that officer.

In case of a vacancy in Presidency, the Vice-President shall become President of the Class.

SEC. 4. The duties of the Recording Secretary shall be to read the minutes, record the proceedings of each meeting, and take charge of all official documents belonging to the Class.

SEC. 5. The Treasurer shall collect all moneys due the Class, disburse the same, with the authority of the President, and keep a strict account of the financial affairs, a written report of which he shall present at every regular meeting.

SEC. 6. Every officer at retirement shall present a written report of all his official transactions.

ARTICLE IV.

ELECTIONS.

SECTION 1. All the officers of this Class shall be elected by ballot on the first regular meeting of the Class of each year, which shall be the last Saturday in October, and shall enter upon the duties of their office at the next regular meeting. A *majority* of the legal votes cast shall be necessary for a choice.

SEC. 2. No election shall be legal unless a quorum vote, and no proxy vote shall be permissible.

ARTICLE V.

IMPEACHMENTS.

SECTION 1. Any member may be removed from office at any regular meeting by a two-thirds (⅔) vote of members present, provided he shall have been impeached in a manner specified in the By-Laws, and provided a *majority* of members be present.

ARTICLE VI.

MEETINGS.

SECTION 1. There shall be a regular meeting of the Class every second Wednesday, unless a majority of the members otherwise decree.

SEC. 2. Special meetings of this Class shall be called by the President.

SEC. 3. *One-fourth* of the voting *members* of this Class shall constitute at special meeting a quorum, but at regular meetings a majority shall rule.

ARTICLE VII.

AMENDMENTS TO THE CONSTITUTION.

SECTION 1. Every amendment, alteration and addition to this Constitution shall be presented by motion and adopted at the regular meeting when presented by a two-thirds (⅔) vote.

SEC. 2. A two-thirds (⅔) vote shall be required to suspend any clause or clauses of the Constitution.

BY-LAWS.

SECTION 1. At the regular meetings of the class, the following order of business shall be obsesved:

1. Reading the minutes of previous meeting.
2. Reports of Committees and Officers.
3. Unfinished business.
4. Miscellaneous business.
5. Adjournment.

SEC. 2. The regular election shall take place immediately after the reports of the Committees and Officers, at which meetings there shall be no other business transacted.

SEC. 3. In case of the absence of both the President and Vice-President, a chairman shall be appointed pro tempore.

SEC. 4. The yeas or nays on any question may be recorded at the request of not less than five members.

SEC. 5. In order to defray whatever expenses the class may incur, each member shall pay accordingly.

SEC. 6. The resignation of any officer or member shall be acted upon at regular meeting when presented.

SEC. 7. All committees shall report finally, within two weeks from the time of appointment.

SEC. 8. All impeachments shall be made in writing, and signed by five members, and all charges shall be particularly specified.

SEC. 9. All impeachments must be referred to special committee to be elected, whose duty it shall be to investigate the charges and make a report, which shall be presented to the class at the next regular meeting, and which, if in favor of the accused shall be final. Otherwise, the class shall deal in accordance with the Constitution, whether he shall be reprimanded, suspended or expelled. The member so complained of shall be furnished with a copy of the charges made against him as soon as the said committee shall be appointed.

SEC. 10. All propositions for amendment, alteration or addition to these By-laws shall be made by motion and voted upon, and may be adopted at the regular meeting when proposed by a vote of two-thirds of members present.

SEC. 11. The whole or any portion of the preceding By-laws may be suspended by a vote of two-thirds of the members present.

SEC. 12. Any other matters.

SEC. 13. An Executive Committee shall be appointed by the Class, consisting of ten (10) in number, as follows: President, Vice President, Secretary and Treasurer of the Class, *ex officio*, and six (6) additional members, equally chosen from each of the two sections, duty of said Committee to see that the commencement exercises of the Class are properly conducted.

Junior Notes.

JUNIORS now is the time fcr review if you have not already commenced. Examination day is less than four weeks off, and there are few of us indeed, whose year's record would not be benefited by some extra study.

BEFORE our next issue, the 20th of April will have gone, and the question, have you passed, will be settled. The JOURNAL merely hopes that every Junior can answer that question with yes.

SKYLER says you don't know what work is until you have pulled Moffat up to the third or fourth floor on the dumb-waiter.

THE class enjoyed a laugh on one of our professors the other day, who after lecturing, several mintutes, describing a chart, discovered that it was upside down.

INVITATIONS are out for a reception to be held at 38 W. 94th street, Thursday evening, March 21, given by Messrs. Jant, Gugorins and Zriner. These gentlemen deserve great credit in trying to bring the class together socially.

PETTINGER says a tuber is the root with a tube on the inside. Some of the class have their doubts.

IT has been decided to hold the arithmetic examination about two weeks before the others, which is very satisfactory indeed. to the students.

PROF.—How would you determine in the power of, percolation when the drug is exhausted.

X.—No answer.

PROF.—Take the cochineal for instance.

X.—Its a light color.

PROF.—Light blue or green.

X.—Light green.

J. Y. CANTWELL, 261 W. 42d Street.

OUR THREE LITTLE MAIDS

Few classes can boast of girls rare
In wisdom, or features fair,
For only Juniors seem to have
Such girls with dark and golden hair.

One from haughty, God's descended
One fr m Cupid's smiling hand,
One like Psyche never offended
Her anger could command.

Such the three in combination
Tipping softly, in they come,
Then a storm of approbation
Slartles like a bursting bomb.

'Tis because the boys are happy
And their hands give vent to bliss,
Not because they would be naughty
Gentle maids don't think amiss.

C. H. PATRICK.

THE SYNTHETIC FOOD OF THE FUTURE.[1]

BY HARVEY W. WILEY.

The problem of human nutrition is the great groundwork of sociology. I use the word nutrition in its broadest sense, including clothing and fuel, which, while not as essential as food to life, are quite as important factors in civilization. Until within a few years the study of nutrition and the means of providing it have been deemed the exclusive function of agriculture. In the development of this idea, we have seen springing into existence in all parts of the civilized world, within the past twenty-five years, colleges of agriculture and agronomic experiment stations in large numbers. Especially in this country have we seen the greatest activity in this line. In all the States and territories, fostered by the federal government, schools have been established in which instruction in agriculture has been made a fundamental branch of the college curriculum. There are fifty-seven agricultural experiment stations in the United States. Each State and territory has at least one. Louisana has three, Alabama, Connecticut, Massachusetts, New Jersey, and New York each two, and the Department of Agriculture

[1] Retiring address of Harvey W. Wiley, as President of the Society, Boylston Hall. Harvard University, Dec. 28, 894. (*Reprinted in Jour. Amer. Chem. Soc., March, 1895*).

two, one in Florida and one in California. For the support of the State and territorial stations, Congress has made an appropriation for the fiscal year ending June 30th, 1895, of $745,000 and for the Department stations $10,000, in all $755,000. The agricultural colleges in the States and territories have also been endowed by grants of public land proportionate in extent to the numbers of Senators and representatives in Congress. The annual money value of these grants varies with their extent and wisdom with which they have been invested, but the total sum is approximately a million and a half dollars. In addition to this a sum of money is granted annually to each agricultural college directly from the treasury, and this sum is to be increased at the rate of $1,000 per annum until it amounts for each institution to $25,000 a year. This amount will be reached in five years. At present the total sum so granted is nearly a million dollars, and it will soon be a million and a quarter. The total amount of the financial aid thus granted directly from the treasury to the agricultural colleges and experiment stations is at the present time approximately three million and a quarter dollars annually. To this must be added the amount given directly by the States and arising from private endowments—a sum of no inconsiderable importance. In all it may be said that about four million dollars in this country are annually devoted to the promotion of agricultural and allied education and research, a sum more liberal than that devoted by any other country to similar objects.

The natural result from such investigations is an increase in soil productiveness, the reclamation of lands supposed heretofore to be unfit for tilage and a greater economy of food production. The supply of human food, therefore, appears to more than keep step with the increase in population and food consumption. In so far as economic reasons extend, there is no occasion to look outside of scientific agriculture for the supply of human food.

But another view is presented of the subject of a more strictly scientific aspect, based on the remarkable progress which has been made in the past few years in the domain of synthetic chemistry. The year 1828 marks a new era in the history of chemistry. It was in this year that Wöhler succeded in making synthetic urea by the union of cyanic acid and ammonia. Urea is not of a high order of organic bodies; in fact, it is a result of retrograde action in the ving organism and the consequent result of the breaking down of higher organic bodies; yet its artificial formation was a brilliant victory of chemical methods, a bold and successful charge on the breast works of organic compounds. To change the figure, it was the crossing of the dead line which had been drawn previously between the living cell and the inanimate crucible. The line once having been crossed, the old distinctions between the organic and the inorganic world have been completely obliterated. With them have gone also the divisions which were supposed to separate the animal from the plant. It is now known that animals do not get their entire nourishment from so-called organic nor plants from inorganic compounds. Many plants, espicially those of free of chlorophyl, live alone on organic compounds. Especially noteworthy among these, from the character of the chemical activity which they manifest, are the vegetations of a bacterial nature, living largely on organic products. Even the green plants first fabricate the inorganic elements into organic compounds before taking them into their tissues. The green cells are the tiny kitchens in which the meals of the plant molecules are prepared.

Without dwelling on further details of this subject, it is sufficient for the present purpose to state that the progress of modern science has entirely changed our ideas respecting the sharp lines of division which were formerly thought to exist between the animal and vegetable, and between the nature of artificial chemical compounds and those produced by biochemical action in the living organism. We stand, therefore, face to face with the fact that it is possible to produce, by artificial means in the laboratory compounds which have heretofore been the results of exclusive biochemical functional activity of living organisms.

One remarkable fact in connection with Wöhler's synthesis of an organic compound is of interest here. While all the chemical world wondered at Wöhler's achievement, nearly fifty years elapsed before this rich field of chemical progress was further cultivated to any extent, with the single exception of the synthesis of acetic acid by Kolbe, in 1845. But since that time remarkable progress has been made. It is not my purpose here to recite in detail the synthetic accomplishments of Berthelot, Kekulé, Kolbe, Maumené, Baeyer, Hoffmann, Frankland, Ladenberg, Fischer, and many other celebrated workers in this field.[1] For the purpose of the present paper, only two points in organic chemical synthesis need be considered; *viz.*, first, the economy of the process, and second, the probability of the production of food compounds suited to the nourishment of man.

In respect of the first point, we find many illustrative examples of synthetic products which are furnished at a so small an expense as to practically exclude from the market the corresponding natural articles. Among these may be mentioned salicylic acid made artificially by Kolbe's process. Salicylic acid occurs as a natural product in the flowers of *Spirea ulmaria* and as a methyl ether in the oil of wintergreen (*Gaultheria procumbens*). It can be formed by synthesis in various ways, as, for instance, by fusion of salicylaldehyde with potassium hydroxide. Salicine, coumarine, indigo, cresol, or toluenesulphonic acid may be substituted for the salicylaldehyde. When phenyl carbonate is heated with a caustic alkali, salicylic acid is also produced. It may also be obtained when an alkaline solution of phenol is boiled with carbon tetrachloride. But none of these processes, although of great interest chemically, have any value commercially save that of Kolbe, or more properly, Kolbe and Lautemann, which consists of passing carbon dioxide into sodium phenylate.

But it will be observed that the phenol which is the base of the process, is itself an organic compound, or the result of the destructive distillation of an organic compound produced by nature. It is not impossible to produce phenol by artificial synthesis. It is said that by surrounding the points of an electric arc light with hydrogen that carbon and hydrogen combine to form acetylene, C_1H_2. According to Berthelot,[2] fuming sulfuric acid absorbs acetylene and the product so formed fused with coustic soda forms phenol or sodium phenate. But it needs no further illustration to show that a phenol formed in this manner could never, on account of its great cost, be used for the commercial manufacture of salicylic acid.

A distinction should be made in this matter between the formation of possible food products by synthesis from existing organic natural bodies, and the synthesis which begins with the inorganic elements themselves. The transformation of one organic body into another of greater value to human industry is quite a different matter from the building up of organic bodies without the help of a living organism.

[1] See Rise and Development of Organic Chemistry, by C. Schorlemmer, revised edition, 1894.

[2] *J. prakt. Chem.*, 2, 10, 93.

[3] *Compl. rend.* 68, 539.

(To be continued.)

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AN HISTORICAL SKETCH OF POISONS.

BY CHARLES E. PELLEW, E. M.,

Demonstrator of Physics and Chemistry in the College of Physicians and Surgeons, New York, and Honorary Assistant in Chemistry in the School of Mines, Columbia College.

SO far as we can tell, the first use of poisons was for smearing arrowheads, and thereby increasing the efficiency of man's early and primitive weapons. The names Toxicology, in fact, is derived from the Greek Τόξον (toxon), an arrow, and in all parts of the world we still find barbarous races employing this device. The first poisons used for this purpose were probably from the poison glands of snakes ; then followed the use of various vegetable compounds, infusions of the dangerous leaves, roots and fruit met with in the woods. Later came the use of stale blood, or other decomposing animal matter, a practice probably first learned from noticing that old and dirty arrowheads produced more deadly wounds than clean ones.

These three varieties of poison are made use of by savage races to this day. The curare, or Indian arrow poison from South America, is chiefly composed of vegetable extracts, but in some cases, at least, it contains material from poisonous ants and from snakes. The pigmies, met and described by Stanley in Central Africa some few years ago, use a most active arrow poison, made from five different plants, and containing considerable strychnine; and in Java th natives still steep their arrows in the dried juice of the deadly Upas tree, the Strychnos Tieute.

But more remarkable are the bacterial and toxine arrow poisons. In the South Pacific Islands the natives have for ages been accustomed to dip their arrows in the decomposing bodies of their enemies slain in battle, and but a few years ago an English missionary, Bishop Patterson, died in agony from a slight wound from one of those weapons. While, quite recently, an account was given in one of the medical journals, of a tribe who envenomed their arrows with mud from a particular swamp, which they had found by experience produced rapid and fatal symptoms of lock-jaw, evidently an early and active, if somewhat unscientific, use of the tetanus bacillus.

After once learning the properties of these substances it was an easy step to begin to use them in food and drink, and we find the priests, as the most intelligent and educated class, in ancient times, as now among the savages, passing down from generation to generation the secrets of this art. In one of the early Egyptian papyri it is mentioned that "whosoever shall disclose this name (referring to some one of the sacred mysteries) shall suffer the penalty of the peach," thereby indicating that at this early period the deadly prussic acid, and the method of preparing it by distillation, had been discovered, and was in use by the priesthood.

As early as Homer's day the properties and uses of various powerful drugs were undoubtedly known. Fair Helen of Troy, for instance, is related to have given her husband Menelaus and his retainers a sleeping draught of 'nepenthe,' the night that she eloped with the ill-omened Paris. This draught, like the drugged cake given by Jason, at Medea's instigation, to the dragon guarding the golden fleece, is supposed to refer to the use of opium; while the story of Circe changing the comrades of Ulysses into various animals by her enchanted wine, has been supposed to refer to the peculiar intoxicating effects of other vegetable drugs, like Cannabis Indica, added to overdoses of alcohol.

The Greeks, until their downfall as a nation, made but little use of poisons for private malice. They employed them as a means of suicide, as for instance, in the case of Demosthenes, and also for a special purpose, *i. e.* for public executions. This was probably owing to the great respect they paid to the human body, which made them unwilling to disfigure it unnecessarily by decapitation or otherwise. The state poison used by the Athenians was a strong infusion of the poison hemlock, *conium maculatum*, and one of the most interesting and most touching passages in all ancient literature is the description by Plato of the death of Socrates, by this means, B. C. 399. Socrates was a thoroughly upright man, a good citizen, a capable soldier, a wise and elevating instructor, but he had raised a host of keen personal enemies by his brusque manners, his new doctrines, and his exasperating methods of public argument. Condemned to death, finally, on the charge of corrupting the young men, he disdained to ask for mercy, and spent his last day with his friends, talking on various subjects of interest, cheering them, and convincing them of his perfect readiness to meet death. Finally, at sunset, the fatal draught was brought in; he drank it quietly, and when, after a little time, the poison took effect he lay down on the couch, covered his face with his robe and passed away. It is interesting to notice that the symptoms of the poison as given by Plato correspond perfectly with those observed by recent experiments with the same drug.

The Persians and other Eastern nations took up the careful study of poisons at an early date and used them freely, if, indeed, we can believe the many tales related by the early historians. Thus one of the Persian Queens, Statira, was poisoned in the royal palace in a very ingenious way. Her mother-in-law was carving a bird and gave one slice to the queen, taking another slice herself. She had spread the poison on one side of the knife only, and so while her own meat was perfectly wholesome, the poor queen on eating her portion was taken violently ill and soon died. The death of Alexander the Great, after his conquest of Persia, was attributed by some of the contemporary historians to poison, although the records, when carefully studied, indicate that he died from malarial fever aggravated by his own imprudence and the folly of his physicians.

In ancient Rome there was a *cause celebre* as early as 330 B. C. It came to the notice of the authorities that there was an unusual number of sudden and suspicious deaths among men of high rank, and especially among senators prominent in sumptuary legislation. On investigation they found a regular association of fashionable women to whose efforts this diminution in the population was due. Twenty-two of the most prominent of them were arrested and examined, but claimed that they were perfectly innocent. They said that they were simply interested in medicine, and had been studying the effects and properties of some new and powerful remedies ; indeed they were so convinced of their own innocence that they offered to drink their own potions in court. They did this, and all died from the effects, while one hundred and seventy more of their associates were hunted out, tried and executed.

Even these rigorous proceedings did not extinguish the habit of poisoning at Rome, especially after the Eastern conquests had introduced to the capitol the luxury and the vices of Greece and Asia Minor. In Sulla's day we find very severe laws passed on the subject, and Sulla's great enemy, Mithridates, King of Pontus, made his name famous for his researches into the properties and uses of poisons. He was one of the first to study the subject scientifically, growing and cultivating trees and plants, employing the physicians of the day to experiment with them, and studying their effects not only on animals but also on man. We find that he was familiar not only with the hemlock, but also with aconite, hyoscyamus, hellebore, and a few other less important vegetable drugs. Mineral poisons were as yet unknown, but he knew the irritant properties of cantharides and other insects, and, curiously enough, seemed to depend largely upon "bulls' blood," probably in a fermented condition.

It is said that Mithridates studied this art not only for use against his enemies, but also to protect himself. Indeed, he is reported to have so fortified his system, partly by constantly taking small doses of poison, partly by the use of antidotes, that when at last, completely overthrown, he tried to save his family and himself from the disgrace of a Roman triumph by the most powerful poison in his possession, he was obliged, after seeing his family die around him, to call in the services of a slave swordsman to put an end to his own life. The composition of his famous antidote, "mithridaticum," as handed down to us, is probably more or less fictitious, for it consists of a mixture of sixty or seventy different substances, some of them absurd, some of them incompatible, and the most active having simply some purgative or stimulating action.

As Roman society became more and more corrupt, towards the beginning of the Christian era, the art of poisoning became of more and more importance, until, in the early Empire, it developed into a court science. The two Emperors, Nero and Tiberius, made the greatest use of it, and in their day the court poisoners achieved a most unenviable pre-eminence. Two women, Locusta and Pontia are the ones whose names have come down to us as the leaders, and the stories of their work show with what extraordinary boldness their crimes were committed. One example will be sufficient. Nero was desirous of getting rid of Britannicus, a gallant young prince of the imperial house, just returned from his conquests in Britain. An attempt was made on his life, but it failed, the young soldier's rugged constitution throwing off the poison. Accordingly Locusta was brought to the palace, and she prepared her potions and made her experiments in the Emperor's presence. Her first decoction was tried on an animal, without success, simply acting as a violent purge. A second brew was made, stronger than the first, which killed a goat in five hours. This was promising, but not yet satisfactory. So a third decoction was made, probably with the aid of a good deal of aconite, and this, tried on a pig, produced almost instant death. It was then ready for the young prince.

There was a banquet at the palace that night. Nero and his family were reclining at their meal. At a lower table lay on their couches Britannicus and the younger members of the family, with trusted attendants standing by each to taste the food and drink as they were handed round, for fear of poison. The wine was passed, thick and syrupy, and hot water was served at the same time to thin it and dilute it. These were duly tasted and mixed, but the young prince, finding the mixture too hot, called for some cold water. A boy ran up with a flask and poured it directly into the cup which Britannicus held out to him. The prince drank again and fell back in his place almost at once, pale, fainting and gasping for breath. The guests started from their seats and crowded around, but Nero ordered the attendants to carry him out, saying that it was a fit, and that he had been subject to them from his youth. So the banquet went on, while Britannicus was lying dead in the anteroom.

Of course in those days but little was known about the post mortem symptoms, and proof of death by poisoning was almost impossible to obtain. This was shown, some little time before, by a curious decision of the great court of the Areopagus, in Athens, to which one of the Roman proconsuls of Asia had referred a case of a woman poisoning her husband. The learned court adjourned the case for 100 years, deeming it impossible to decide truly on the testimony offered. In this case of Britannicus there was so much reason for suspecting foul play that the populace insisted upon having the body of their beloved prince exposed in the Forum. The proof then mostly relied on, at any rate by the laity, was the external appearance of the body, and it is related that, dreading this exposure, Nero had the face of the dead prince carefully painted and whitened, so as to look natural. This answered very well till the afternoon, when a thunder-storm came up, and beating upon the corpse, washed off the chalk and exposed the livid, discolored features beneath.

(*To be continued.*)

FIRST AID TO THE INJURED.*

By A. ERNEST GALLANT, M.D.
Lecturer for the Society for First Aid to the Injured, etc., New York.

During the summer of 1891 my vacation was spent in the picturesque and historical region of the Madeline Islands at the northwestern end of Lake Superior, and there I witnessed the devastation wrought by one of those terrific wind and rain storms which come up so unexpectedly from the lake. Nothing can stand before its fury. Windows forced in, houses unroofed and lifted from their foundations, cellars filled, foundations undermined, and frequently serious results to life and limb. Just as the storm came up a small traveling circus of one tent and a few cages of wild animals was filling the hearts of the country folk, from far and near, with all the wonders of the ring, clown, bareback riders, etc. In an instant the tent and its occupants were dashed with terrific force to the ground and pandemonium reigned supreme. Women and children screaming, wild animals howled and roared, strong men fought with the fury of the insane to free themselves from the debris, cut heads, bruised bodies, dislocated and fractured limbs were numerous. All combined to make a scene almost sheolish. Every physician in the neighborhood was called to the spot and the wounded received appropriate care. The scene remains vividly impressed on my mind and has convinced me of the importance of training every man, woman and child in First Aid.

In order to present the subject in a *nemonic* way the title of the organization may be divided as follows:

I. The Society.

II. For Instruction in First Aid.

III. To the Injured.

*Delivered before the New York College of Pharmacy, April 10th, 1895.

I.—THE SOCIETY.

Following out the noble work of Miss Florence Nightingale, Professor Esmarch established the Samariter Verein in Germany, and later the work was carried to the British Isles, where, under the title of St. John's Ambulance Association of London, and the patron saints of Ireland and Scotland, the work has extended to the antipodes.

Throughout the British domains, not only laymen, but the police, military officers and men, railroad employees, miners, and many others, have been instructed, examined, and granted certificates. The St. John's Association has granted nearly 25,000 certificates, distributed over 40,000 Esmarch bandages and sold over 70,000 books on "First Aid."

In this city the First Aid work was organized in 1882, as a committee of the State Charities Aid Association, under the championship of the late General G. B. McClellan. In 1883, having outgrown the work originally started, the committee reorganized as the Society for Instruction in First Aid to the Injured.

The report of the society for the eleven months ending March, 1895, shows that during that period 39 classes, made up of 228 men and 330 women, received the regular course of instruction. Since the organization of the society 7,443 persons have taken the regular course and 3,927 passed the examination and were awarded diplomas.

II.—FOR INSTRUCTION IN FIRST AID.

The object of the Society is to give instruction by means of lectures and practical demonstrations in the use of means to be employed before a physician arrives, and thus provide for the immediate application of the measures at hand to allay suffering and save life.

The course consists of five lectures, which are given free to those unable to pay; for others, the fee is three dollars.

One lecture per week, of one hour and a half, the last half hour is devoted to practical work, such as the application of bandages and splints, restoration of the apparently drowned, lifting the injured, carrying on stretchers, etc.

The course of five lectures and the examination embraces a brief description of the bones, muscles, veins and arteries, and points where the circulation may be controlled by pressure, hemorrhage, and various means of controlling it.

Artificial respiration, resuscitation of the apparently drowned, the treatment of burns, scalds, frozen limbs, and bites of animals. The signs and treatment of fractures; how to apply splints, first aid to those suffering from shock or collapse, fainting, sunstroke, apoplexy, epilepsy or drunkenness. Lifting and carrying the injured with improvised stretchers. In addition, for women only, nursing, ventilation of sick rooms; use of thermometer; making poultices; changing sheets; lifting the sick, and how to feed them.

. The examination is held by the Medical Examiner, the week following the last lecture, and all are expected to attend. Diplomas are awarded to those who prove themselves to possess an intelligent comprehension of the subject.

III.—TO THE INJURED.

Every individual who is suffering from the result of an injury, with or without an external wound, from any cause, is a subject for assistance from graduates in first aid.

Confining ourselves for this evening to the subject of *wound treatment*, we will consider it in the natural order, viz.:

1. Expose the wound.
2. Stop hemorrhage or bleeding.
3. Dress the wound.
4. Rest.
5. Shock.

EXPOSE THE WOUND.

In order to ascertain the seat and extent of injury, we must first take off or cut away the clothing and expose the injured member, the importance of this point cannot be over estimated, and may be illustrated by the experience of one of our graduates. "The street accident she had so earnestly prayed for, took place." The man had broken his leg !

She confiscated the walking stick of a passer-by, and broke it up in three pieces for splints. She tore up her skirt for bandages.

When all was completed she summoned a cab and took her patient to the hospital.

"Who bandaged this limb so creditably?" inquired the surgeon.

"I did," she blushingly replied.

"Well, it is most beautifully—most beautifully done ; but you have made, I find, one little mistake. You have bandaged the wrong leg."

STOP THE BLEEDING.—(A.) NATURE'S METHODS.

Nature has endowed us with three means by which she attempts to stop bleeding : (a) As soon as a man is injured we note that the face and whole surface of the body becomes pale and he complains of feeling weak and faint. This condition is due to the sudden contraction of the arteries throughout the body, and the heart pumping with less vigor, thus reducing the force with which the blood is distributed throughout the body. We can increase the effectiveness of this condition by holding the limb perpendicular. (b) Next we notice at the point of injury the blood congeals or clots to form a plug which will seal the open mouths of the torn vessels. This coagulation we encourage by exposure to the air, and (c) by keeping the part absolutely at *rest*.

(B.) ARTIFICIAL METHODS.

1. *Pressure* of the (a) *thumb or finger* directly in the wound is the most natural and almost instinctive way of arresting bleeding, or a (b) pad of gauze, muslin, or linen wet in water, squeezed as dry as possible and tightly bandaged *over the wound* will readily control the hemorrhage. When, however, large arteries have been severed, and extensive injury done, it will be necessary to bring pressure to bear at some point *above the injury* to shut off the whole blood supply to the limb by compressing the main artery. In the *middle of the groin* the femoral artery can be readily compressed by the thumbs on the thigh bone; and the brachial artery is easily recognized, pulsating, by pressure of the fingers in the groove along the *inner side of the upper arm*. These two landmarks are known as *pressure points* and important to keep in mind. The fingers or thumbs soon become tired and resort must be had to the (c) "improvised torniquet" or the (d) Esmarch rubber tube. To apply the torniquet, loosely tie a piece of bandage, muslin or string around the limb, place a pad of gauze, or a roller bandage, over the artery at the points named above, and with a stick twist the loop until the pad is pressed very tightly against the limb and the bleeding ceases. Any piece of rubber-tubing or bandage, elastic suspenders or garters wound very tightly around a limb will control the most severe hemorrhage. A hard pad place in the bend at the knee, and the leg pressed firmly against the thigh will stop bleeding from the foot or leg. It is important to remember that the blood is forced from the heart through the arteries to every organ and member of the body, thence passes through the hair like capillares and is then taken up by the veins and carried *back to the heart* to be again sent out on its life-giving function. If large veins are torn the bleeding will continue even after we have put on the torniquet above the wound as it has only stopped the current *from* the heart and not *toward* it. A tightly fitting bandage or another torniquet *without a pad* must be put on *below* the seat of injury.

2. *Position.*—Raising a limb to the perpendicular will markedly diminish the blood supply and materially aid in arresting hemorrhage.

DRESS THE WOUND.

In considering how to dress a wound our chief anxiety must be to prevent the serious condition, unfortunately so frequent, known as blood poisoning.

Whenever the epidermis or scarf-skin is injured, even if the opening be no larger than the prick of a needle-point, serious results may occur. You ask me why? Certain forms of vegetable life or bacteria (almost omnipresent), when in any way introduced and *shut in under* the skin, rapidly multiply and produce poisons (toxines), which being unable to get out at the point of entrance, are forced into the blood and lymph vessels and poison the whole system. How can we avoid so dire a result? By applying a dressing that will prevent the skin from healing over and shutting up the poisonous germs, and which, sponge-like, will soak up the bacteria, the poisons which they generate, and put the wound in such a condition that they cannot live. Recent investigations by some for the most eminent pathologists have proven that infected living tissue can not be wholly freed from infection by any known method of washing or by the use of chemicals not dangerous to life. Absorbent cotton, dry gauze, powders, ointments, etc., only help to form an impregnable "scab" which dries over the wound, shuts in the germs and produces the condition we wish most to avoid.

Appreciating the importance of this fact in relation to infected wounds, Professor Van Arsdale, of the New York Polyclinic, spent several years while in Germany experimenting with various drugs in watery solution and oily mixtures, and determined that

℞ Bals. Peru .... ♏xxx
Ol. Ricini .... ℨi

on absorbent gauze (sterilization not necessary) prevented the union of the edges of the skin and allowed the gauze, like a moist sponge, to absorb the discharge as fast as formed from the wound.

DIRECTIONS FOR USE.

Take cheese-cloth or absorbent gauze, fold it about 16 to 32 thicknesses, large enough to a little more than cover the wound, pour on sufficient balsam oil to soak three or four layers of gauze and apply the oily side directly to the wound. Next cover the gauze with gutta percha or rubber tissue—oil muslin or oil silk will do as well—then bind the whole on with a triangular or roller bandage.

USES.

The above dressing is applicable to all cases where the skin has been in any way injured, such as bruises, cuts, burns, scalds, acids, punctured wounds, bites of snakes or animals, insect stings, frost bites, crushed fingers or toes, etc. Leave the dressing on for three days, if surgical advise cannot be secured. This places the wound under the most favorable conditions for rapid healing.

For First Aid purposes in the city, one ounce balsam oil, one yard absorbent gauze and nine square inches rubber tissue will be *q. s.* for the majority of wounds. Large quantities must be supplied in cases of extensive destruction of skin, as in burns or scalds.

REST.

In nearly all cases of injury we must assist what Professor Hilton has called the "chief natural therapeutic" by the use of a sling, splints or other means of securing *rest* to the injured member. The exact knowledge of the anatomical relations necessary to replace a fractured limb compel a word of warning not to attempt to do more than apply a temporary splint, that we may avoid making the injury greater.

The Triangular Bandage of Esmarch affords the most convenient bandage for First Aid work, the many uses of which form an important part in the course of instruction. Take a square of muslin, gauze or cheese-cloth, fold on the bias and cut so as to give two triangles. Fold to the desired width, begin by folding in the central point. A triangle made from yard-wide cloth makes an excellent sling in case of injury to the hand, arm or shoulder.

SHOCK.

After any injury of more than slight severity we notice the face is pale, the surface of the body cold, the pulse is feeble, respiration slow, and if conscious, the patient complains of feeling faint and dizzy. Many faint from fright, the loss of blood or severity of the injury. Under these circumstances, after having controlled the hemorrhage, everything must be done to stimulate the circulation.

Heat in any form, applied externally or internally, is the best stimulant. Hot water *ad libitum*, with a little whisky or brandy, by the mouth or injected into the rectum through a fountain syringe—whisky one ounce, hot (115°–120° F.) water six or eight ounces, every hour or two, with hot bottles placed *outside* the blanket, to avoid burning the skin, hot bricks, sand bags, dry flaxseed, etc., placed around the body and between the legs—will all aid in overcoming the serious condition fatal to so many, known as shock.

Brisk rubbing of the limbs toward the body will also aid the circulation.

When the face is flushed or the head injured avoid the use of stimulants.

CLASSES.

Classes of five or more are constantly being formed at the society rooms, 105 East Twenty-second street, where information may be had regarding the course, and hand-books and other supplies may be procured.

The Alumni Journal

Published under the auspices of the

Alumni Association of the College of Pharmacy

OF THE CITY OF NEW YORK,

115-119 WEST 68th STREET.

Vol. II. May 1, 1895. No. 5.

THE ALUMNI JOURNAL will be published Monthly.

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All copy for publication, or changes of advertisements should reach us on or before the 20th of the month previous to the issue in which they are to appear.

All matters relating to publication should be written on one side of the paper only, and sent to the editor,
HENRY KRAEMER, 115-119 West 68th Street.

All communications relating to finances and subscriptions should be addressed to
A. HENNING, Treas., 115-119 West 68th Street

All communications relating to advertising should be addresssd to
A. K. LUSK, 1 Park Row.

EDITOR'S ANNOUNCEMENT.

WITH this issue terminates the services of the present editor in his editorial capacity of THE ALUMNI JOURNAL. We were in hopes of introducing in this issue the new Editor to the readers of THE ALUMNI JOURNAL, but as we go to press we understand that the final negotiations have not been made, and we must, therefore, refrain from any statements in this direction. We can say, however, that the mantle of editor is very likely to fall upon an alumnus of the College of Pharmacy of the City of New York. It seems very fitting at this time to urge upon the members of the Alumni Association, and all those affiliated, either directly or indirectly, with the college, to support him in his arduous labors of making THE ALUMNI JOURNAL, (what we have before published, as being its prime object)—the avenue whereby the college, and alumni and students primarily shall be benefited. If he does not receive this support it will be necessary for him to fill up THE JOURNAL with such material at his command, and which he may consider of the greatest value to this end. In the January issue we emphasized this fact, that the first object of THE ALUMNI JOURNAL was to publish news concerning the alumni and the college, and that all of the other things incorporated were but subsidiary in the JOURNAL, although of value to the readers.

PHARMACEUTICAL FELLOWSHIPS.

IN addition to the Fellowships previously announced as being held by the School of Pharmacy of the University of Wisconsin, we now learn of this institution receiving two more graduate scholarships of $400 each, both for two years. Again we repeat: when will we in the East awake out of our lethargy and see that quality is more desirable than numbers and that these Fellowships mean higher pharmaceutical education.

PRELIMINARY EDUCATION.

THE reason why students do not seek, and all colleges of pharmacy do not require, a higher preliminary education than is even demanded by the best of them, is because of the questionableness of its paying. It seems well at this time to repeat an old story, the moral of which is very evident:

Some years ago, a gentleman residing at South End, in Boston, was furnished with a prescription containing among other ingredients the following:

Syr. Scillæ................ 1 fl. oz.
Tinct. Ejusdem............ ½ fl. oz.

With the recipe he went to the nearest apothecary. "I cannot put up that medicine for you," said the apothecary. "I have all of the ingredients but one—Tincture of Ejusdem. Dissapointed, the gentleman went from one drug store to another, until at lenth he reached the store of a well-known pharmacist at the North End. Without making any remarks, the pharmacist proceeded to put up the recipe. "What! exclaimed the gentleman, have you Tinct. Ejusdem! I have been to fifty shops, more or less, but no one had it. Some pharmacists even averred that they had never heard of it." "The recipe," quietly remarked the druggist, "calls for one ounce of Syr. of Squills, and a half fluid ounce of the Tincture of the same."

AN EXAMPLE.

In the British and Colonial *Druggist* of a recent issue, we find the following: "The antidiphtheritic serum of the Pasteur Institute is now being delivered to pharmacists in Paris. None is distributed to any but pharmacists, to whom the public and the doctors should apply for it." In America, we have some things of which we are proud, but we cannot or ought not to forget that we have not by any means all of the best things. Experience also teaches us that what is a good thing in one place may not be good in another. Living in a Republic, we have factors which, as the nation grows, seems to prevent the universal adoption immediately of even these things which are applicable here, and so while we must cherish the example of the physicians and pharmacists of Paris, we exceedingly regret that we see no possibility of this rational condition of affairs in the United States.

AMERICAN PHARMACEUTICAL ASSOCIATION.

Organized 1852. Incorporated 1888.

Section on Pharmaceutical Education and Legislation.

The Committee on Education and Legislation of the 43d annual meeting, to be held at Denver, Col., August 14, 1895, desires to present statistical information on these two important branches this year.

In order that the educational and legal status of Pharmacy may be improved, it is deemed essential that the present requirements as existing in over forty States be summarized for ready reference and comparison. Secretaries of Pharmacy Boards, Colleges and other members are respectfully requested to transmit the information required for the subjoined Queries at the earliest date for tabulation by the Secretary.

Papers on subjects considered by this Section are urgently solicited and should be in hand together with an Abstract or Synopsis *not later than June 15* that they may be printed for distribution at the meeting.

Kindly advise the Secretary of this Section as promptly as possible what contribution you intend to make.

Fraternally,
James M. Good, *Chairman*,
2348 Olive st., St. Louis, Mo.
James H. Beal, *Associate*,
Scio, Ohio.
Carl S. N. Hallberg, *Sec'y*,
358 Dearborn st., Chicago, Ill.

POISON LEGISLATION.

1. The legal restrictions on the practice

of Pharmacy in English-speaking countries are primarily based upon the principle of protecting the public against the indiscriminate sale and use of poisons.

It is desirable to have a collective report of the Poison Laws of the States, including separate Acts as well as the Poison sections of the various Pharmacy Laws, the important provisions, with suggestions for their codification, to be presented in tabulated form.

2. Present a list of Proprietary Articles containing poisons: medicinal, antiseptic, insecticidal, or of general or popular use, giving the character of the poisonous ingredients and approximately their proportion; also state whether or not the packages contain any references to, or caution against the dangerous character of the contents.

3. The Committee of this Section desires to present a Statistical Report on the number of deaths and percentage of death-rate occurring during a stated period (one or more years) from the use of poison, stating (1) kind of poison, (2) in the form used, (3) accidental, (4) suicidal, or (5) homicidal.

This information may be obtained from the Coroners and should be transmitted to the Secretary of this Section.

REGISTRATION STATISTICS.

This Committee desires to present a Collective Report embracing the following information from every Pharmacy Board in North America, based upon the year 1894:

4. REGISTRATION OF PHARMACISTS OR LICENTIATES:

a) The total number of Candidates for Registration as R. Ph's or Licentiates.

b) The total number registered as R. Ph's or Licentiates.

c) The number of Graduate Candidates.

d) The number of Graduates registered on Diploma.

e) The number rejected on Diploma.

f) The number of Graduates registered by Examination.

g) The number rejected by Examination.

h) The number of Non-Graduates registered by Examination.

5. REGISTRATION OF ASSISTANTS.

i) The total number of Candidates for Registration.

k) The total number of persons registered as Assistants during the year 1894.

l) The number of Graduate Candidates.

m) The number of Graduates registered on Diploma.

n) The number rejected.

o) The number of Non Graduates registered by Examination.

6. REGISTRATION OF APPRENTICES:

p) The number of Apprentices registered.

r) The Educational Requirements.

s) The Age.

COLLEGE ATTENDANCE.

It is asserted that the great multiplication of Drug Stores is in a measure owing to the large number of graduates turned out by the Pharmaceutical Schools and Colleges.

7. Present statistics showing the number of students in attendance at the Pharmaceutical Schools and Colleges in North America. Also the number graduated during the same period. To attain uniformity in the proportion of graduates to students, the period covered by one school year, '93–'94, should be taken.

8. Should Scholastic Education be required preliminary to entrance into Pharmaceutical Schools or Colleges? If so, in what degree is it practicable of enforcement? Should such education be a requirement for registration of Appren-

tices by the State Boards of Pharmacy preliminary to eligibility for examination as assistant and pharmacist?

9. Present an exhibit of practical experience requirements for all the Pharmacy Laws. What should be the minimum period required for the respective grades of registrations and how can this be defined as applied to practical experience in a pharmacy or "drug store?"

REGISTRATION REQUIREMENTS

10. What States recognize more than one grade of Licentiates, and by what Titles are the several grades distinguished? When two grades of licentiates are recognized, what are the Age requirements?

a) For the higher or Pharmacist's grade?

b) For the lower or Assistant's grade?

11. In what States is it customary to present the same list of Questions to Candidates for both grades, the grade or certificate granted, depending upon the percentage of correct answers returned by the Candidate? What are the advantages and defects of this method?

12. To what extent is it customary for Pharmacy Boards to require Candidates to demonstrate by practical work their fitness for Registration? Is it possible under existing circumstances to greatly extend the principle of practical examinations?

13. Where experience is a requirement for graduation or registration, should a distinction be made between experience gained in a city pharmacy and that obtained in a country drug store, and what should be the ground of such a distinction when made? Also, to what extent, if any, should menial service in a drug store, unconnected with compounding, be taken as experience?

14. What Pharmacy Boards and what Institutions teaching pharmacy make any of the above named distinctions as to what constitutes "experience in a drug store?"

Section on Scientific Papers.—1895.

LIST OF QUERIES.

1. Is the thin green Wild Cherry Bark really more valuable therapeutically than the older and thicker brown barks? Make comparative assays.

2. Do all the well known brands of Quinine Sulphate conform to the tests of the U. S. P., 1890?

3. Devise a method of assaying Digitalis that yields the true amount of the one or more active principles of the drug.

4. Separate, purify and describe the various active ingredients of digitalis.

5. Is English Digitalis as superior to the German as the difference in price would indicate?

6 What percentage of the U. S P. pepsins of the market come up to the pharmacopœia requirements?

7. Determine in case of such drugs as can be secured whether they yield products of greater value therapeutically when percolated in the fresh than in the dry state.

8. Compare all the well-known methods of assaying Belladonna leaves, Belladonna root and Henbane leaves, applying titration by volumetric acid solution to each, and determine which method extracts the most alkaloid from the drug.

9. Do the same for Coca leaves and Ipecac Root.

10 Determine the relative values of Western and Southern Senega.

11. What is the quality of Calcium Sulphide dispensed by pharmacists?

12. In what cases can Acetic Acid be advantageously substituted for alcohol in the exhaustion of the drug?

1871-1895

ALUMNI ASSOCIATION

OF THE

COLLEGE OF PHARMACY

OF THE CITY OF NEW YORK

ALUMNI DAY

WEDNESDAY, MAY 8TH, 1895

EXERCISES TO COMMENCE AT 2 P.M.

OFFICERS AND COMMITTEES

OF THE

ALUMNI ASSOCIATION.

President.

HERMAN GRAESER.

Vice-Presidents.

A. C. SEARLES. DUDLEY T. LARIMORE.

PETER J. EHRGOTT.

Treasurer.

ADOLPH HENNING,
68 WILLIAM STREET.

Secretary.

WM. A. HOBURG, JR.

Registrar.

NEWTON DART PHILLIPS.

Executive Board.

TO SERVE ONE YEAR	K. C. MAHEGIN. ALFRED STOVER.
TO SERVE TWO YEARS	FRED HOHENTHAL. WM. A. HOBURG, JR.
TO SERVE THREE YEARS . . .	D. PERAZA. C. BENKENDOERFER.

Delegates to the Annual Meeting of the American Pharmaceutical Association.

THOMAS F. MAIN, CHAIRMAN.

EDWARD V. ZOELLER. EWEN McINTYRE.

SAMUEL J. HINSDALE. D. PERAZA.

Committees.

ON PAPERS AND QUERIES.

WM. H. EBBITT. JOHN OEHLER.

WM. H. MADISON.

ON PUBLICATION.

ADOLPH HENNING, FRED HOHENTHAL.

ALFRED STOVER.

HERMAN GRAESER.

PRESIDENT ALUMNI ASSOCIATION, COLLEGE OF PHARMACY, CITY OF NEW YORK.

WM. A. HOBURG, Jr.

Secretary Alumni Association, College of Pharmacy, City of New York.

ADOLPH HENNING,

TREASURER ALUMNI ASSOCIATION, COLLEGE OF PHARMACY, CITY OF NEW YORK.

COLLEGE OF PHARMACY,

OF THE CITY OF NEW YORK,

115 WEST 68TH STREET.

THE NEW COLLEGE BUILDING.

THE College Building is six stories high, fireproof throughout, and the only building in the world constructed for the education of pharmacists exclusively. Accommodations are supplied for 1,000 students with perfect comfort, and many more may find room for work without crowding. The Laboratories are fitted up for 150 students working simultaneously—a feature of the greatest importance.

The designs for the building were under consideration for nearly a year, and are the result of the best architectural skill, combined with the judgment of a score of the best members of the pharmaceutical profession in the United States. Every detail for the *practical* education of the student has been most carefully considered, and no expense has been spared to carry out this all-important object.

The exterior is after the Italian Renaissance architecture, built of light grey stone, buff brick and terra-cotta, decorated with marble to harmonize, making it an ornament to our city and something to be proud of in the memories of the alumni of the College.

The interior, of iron and fireproof materials, has been planned to afford the greatest possible comfort to the individual student, and special care has been given to the important sanitary problems of light and ventilation to insure the preservation of the health of its occupants. It is probably the best heated, lighted and ventilated college building in the United States.

On the BASEMENT floor will be the apparatus for heating and ventilating, consisting of boilers, engines and fans for forced circulation of fresh warm air. Here are also located the students' coat room and gymnasium, and commodious toilet rooms, together with large storerooms for the College supplies, and a special room for the comfort of lady students, of which our College has a number every year.

The FIRST FLOOR, a few steps above the street level, contains the Office of the College, the Library, with the best collection of books on Pharmacy and the allied sciences in the United States; the fine Canby Herbarium, recently acquired by the College at great expense; the handsome meeting room for the College members and the various affiliated societies, such as the Board of Pharmacy of the City of New York, and the Alumni Association. Here also will be found the Trustees' Room.

The SECOND and THIRD FLOORS are devoted to the LECTURE ROOM, and accomodations for the preparation of lectures, with special rooms for Quizzes. The lecture room is built to accommodate 500 students, and seats are provided for 400. It has been designed without columns to give every student an unobstructed view of the lecture table, and every seat is an independent and comfortable arm-chair, with an extension on the right arm, that students may take notes with comfort and dispatch. This room is lighted in such a manner that the faces of both professors and students are protected from glare. The heating and ventilation is by machinery specially constructed for the purpose, and the most perfect of its kind.

On the FOURTH floor is located the DEPARTMENT OF BOTANY and MATERIA MEDICA. Here will be found the Museum of *Materia Medica*, the Microscopical Laboratory, for 100 students, working at microscopes together; also, special rooms for the accommodation of the Professor of the Department and his assistants. Quiz rooms take up part of the fourth floor.

On the FIFTH floor is located the PHARMACEUTICAL LABORATORY, which will accommodate 450 students, 150 working simultaneously; each student having his own individual closet and drawer for apparatus. There is probably no laboratory in the world so well fitted for the instruction of students in practical pharmacy. The floors are asphalt, perfectly water-tight, and the drainage has been designed with special reference to pharmaceutical manipulations, on a practical scale. The heating and ventilation of this laboratory has been thoroughly studied and arranged for. On this floor also are the supply room for the laboratory, a scale room and accommodations for the director and his assistants.

On the SIXTH floor is located the CHEMICAL LABORATORY, with accommodotions for 450 students, or 150 working simultaneously; each student

---

having his own individual closet and drawer for apparatus. Like the Pharmaceutical Laboratory, the floors are asphalt and water-tight. The ventilation of this room has been well provided for, with high side windows and two large skylights; the heating, also, has received the best attention. On this floor there is a stock room for supplies, a scale room, accommodations for the director and his assistants, together with toilet rooms for all laboratory students.

All the laboratories have been specially arranged to give the students *practical* instruction, by making them work with their instructors and at the same moment; a system without a rival in scientific education.

From the above it will be seen that the College of Pharmacy of the City of New York is the best equipped institution of the kind in the world, with the *safest*, *healthiest* and *most comfortable* building that human skill and forethought can construct for the education of the pharmacist. We claim it is without a rival anywhere, either in its Faculty, its methods, or its accommodations.

HISTORY

OF THE

ALUMNI ASSOCIATION.

THE ALUMNI ASSOCIATION of the New York College of Pharmacy was founded May 24th, 1871, for the purpose of elevating the standard of Pharmacy, advancing the interests of the College, and bringing the graduates of the College into closer fellowship.

Among the founders of the Association were the following well-known guaduates: ,Messrs. Thos. F. Main, P. W. Bedford, for many years Professor of Pharmacy at the College, and one who always to the end of his life worked for that which was highest and best in Pharmacy; Jules L. A. Creuse, Theo. Frohwein, B. F. McIntyre, M. Frohwein, Geo. C. Close, Class of 1831, one of the first three graduates of the College, one actively interested in everything pertaining to the welfare of the Association and the College for a period of sixty years, until his death in 1891, a splendid example of faithful devotion to Alma Mater, W. Hegeman, and Wm. Wright, Jr.

At this time the College was occupying rooms in the University building in Washington Square.

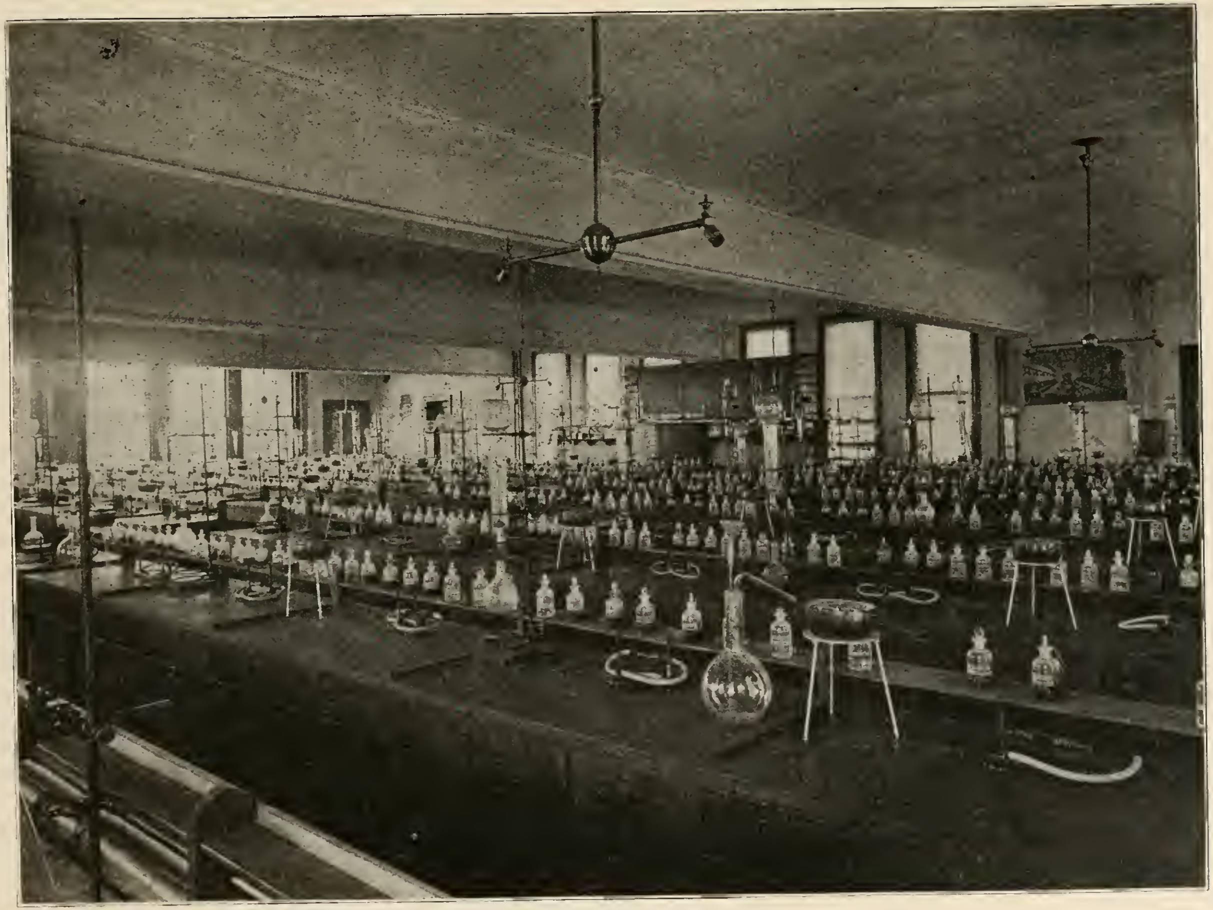
The first president of the Association was Mr. Daniel C. Robbins. Conversational meetings were features of these earlier gatherings of the Alumni Association, where original papers, of value and interest to Pharmacy were presented by the members. One of the first acts of the Association after its establishment, showing the desire to stimulate the students to greater and better efforts, was the offer of a prize for the presentation of the best thesis by a member of the graduating class. A few years later this offer was changed, and a gold, silver and bronze medal was awarded to the students ranking first second and third in order of merit; the ten

students coming next in order with the three medal men constituting a roll of honor of thirteen, proving the fallacy of the superstition that thirteen is an unlucky number.

With the ever increasing number of students the rooms at the University building were soon found too small, and in 1878 the building at 209-211 E. 23d Street was purchased and fitted up. With larger lecture room, a fine museum, library and laboratory, a more perfect system of pharmaceutical education was possible. To aid in this work of education the Alumni Association presented to the College a set of Plastic Models to be used in illustrating the botanical lectures on the structure of plants.

Shortly after this the Association presented a set of physicial apparatus to be used in the department of physics, proving the effort of the Association to carry out the purpose expressed in the preamble of its constitution, of elevating the standard of Pharmacy, and advancing the interests of the College. In the other objects of the Association, that of promoting closer fellowship between the graduates of the College, and of helping the undergraduates, the Alumni has been successful, as the attendance at the "Annual Outings" and lectures given each month by prominent lecturers testifies. In 1889 "Alumni Day" was inagurated. This is particularly a day of rejoicing for the Junior Class, and one of reunion for the whole Association. The efforts of the Junior Class was recognized by the Association, and a Junior Roll of Honor established, and on this day the Junior prizes are awarded.

Once again the growth of the College necessitated the building of a larger home. The property, 115–119 West 68th Street was purchased and a magnificent College erected. It was opened for students last year. In facilities for pharmaceutical education it is the most perfect building in the world. The science of Pharmacy during the past twenty years has made wonderful progress, and among those who have helped materially in furthering its interests we find the names of many of the Alumni, and as we look about and see honored positions in Pharmacy, Medicine, Chemistry and Botany filled by members of the Alumni Association we feel indeed that her motto, "*Alere Flammam*," has been well heeded.



CHEMICAL LABORATORY.

PROGRAMME.

PART I.

1. PIANO SOLO, ... Selected.
WALTER A. PICK.

2. ADDRESS OF WELCOME TO CLASS OF '95.
HIERONIMUS A. HEROLD, Ph.G., Chairman Alumni Day Committee.

3. VIOLIN SOLO, ... Merry Musical Monologue.
HUGH J. EMMETT.

4. SOPRANO SOLO, ... Selected.
MRS. CLARKSON TOTTEN.

5. INSTRUMENTAL SPECIALTIES.
LITTLE MAUDE LAMBERT.

6. TENOR SOLO, ... Popular Songs.
MR. HARRY HENRY.

7. THE SYMPHONY ZITHER CLUB.

PROGRAMME.

PART II.

1. PIANO SOLO, ... Selected.
WALTER A. PICK.

2. NOVEL VENTRILOQUAL ODDITIES.
HUGH J. EMMETT.

3. ANNOUNCEMENT OF THE ROLL OF HONOR.
By Chairman of Examination Committee.

PRESENTATION OF THE ALUMNI PRIZES.
By HERMAN GRAESER, Ph.G., President of Alumni Association.

4. SOPRANO SOLO, ... Selected.
MRS. CLARKSON TOTTEN.

5. THE MINUET.
LITTLE MAUDE LAMBERT.

6. SYMPHONY ZITHER CLUB, ... Selected.
With Solo by OTTO LOESCHNER.

7. TENOR SOLO. . . . . Selected.
MR. HARRY HENRY.

The Piano used on this occasion is from the well-known firm of Strich & Zeidler.

13. Is Alexandria Senna superior to Tinnevelley Senna ?

14. Give an account of the various nostrums that depend for their efficacy and value upon Acetanilid and if possible give their analysis.

15. Is the decidedly different yield of Pilocarpine due to two species of Pilocarpus? If so, what are the species and what is their relative content of alkaloids? If not, why has Pilocarpine been so scarce ?

16. Do Ignatia Beans possess any superiority over Nux Vomica buttons ?

17. Give the relative alkaloidal value, *i. e.* percentage of the cornutine of Keller, of Spanish, German and Russian Ergot.

18. Examine and report upon the various kinds of Quinine Sulphate pills dispensed by pharmacists. Do they contain the claimed amount of Quinine Sulphate, and do any of them contain Cinchonodine Sulphate ?

19. Honduras Sarsaparilla is said to be superior to Mexican ; is this supported by facts ?—If so, demonstrate it.

20. What is the quality of Oil of Peppermint dispensed by pharmacists ?

21. Does Calendula possess sufficient therapeutic power to merit its recognition as an official drug ?

22. What is the relative value of Guarana and Kola Nuts as to their content of Caffeine, and do they differ therapeutically in any particular ?

23. To what extent is Cotton Seed Oil used as an adulterant in preparations used by pharmacists ?

24. Are all chemicals imported from Europe as chemically pure as they are generally claimed and believed to be ? A full report upon those that are most generally used would make interesting reading.

25. Does the Aloin of the market conform to the requirements of the U. S. P.?

26. Cali Nuts are being offered when Calibar Beans are called for. Make a comparative chemical study of the two seeds.

27. A microscopical examination of the root of Solanum Carolinense and further chemical work upon its alkaloid is desirable.

28. To know the relative antizymotic power of Boric, Benzoic and Salicylic Acids would be very valuable, and also the extent to which they may be safely employed for the preservation of Infusions, Mucilages, Fruit Juices, etc.

29. Much of the Orange Flower Water and Rose Water of the market is said to be made from Essential Oils. Is such the fact, and how does the product compare with that made by distillation ?

30. Tests for the quality of Insect Powder are desired.

ALFRED R. L. DOHME,
Baltimore, Md., Chairman.
GEORGE B KAUFFMAN,
Columbus, O., Secretary.
J. O. SCHLOTTERBECK,
Ann Arbor, Mich, Associate.

THE COLLEGE OF PHARMACY OF THE CITY OF NEW YORK.

BY PROF. HENRY H. RUSBY, M. D.

(*Continued from April, 1895 issue.*)

While the general average of the medical education in this country is doubtless higher than the pharmaceutical, yet this statement can in no sense be applied to the particular branches taught in the pharmacy schools, especially concerning *materia medica*. The instruction given at even our best schools of medicine represents but a fraction of that which every properly educated pharmacist is expected to receive. As to our second and lower class medical colleges, the conclusion is inevitable that they neglect this branch of study with the expectation that the pharmacist is to exercise a supervision over the prescriptions of their graduate, and to save him from the results of the ignorance in which they have left him.

In manufacturing medicinal preparations from crude materials, and in filling prescriptions, there is demanded of the pharmacist a degree of chemical knowledge which is both very deep and extensive. The ever increasing number of new chemical compounds of complex structures and more complex relationship, their unstable nature, and their tendency toward vitiating or dangerous reactions has necessitated a revolution in the extent and methods of chemical instruction in schools of pharmacy.

A similar change has taken place in the department of practical pharmacy, wherein the student learns to apply the theoretical information gained in the department of chemistry. Every student realizes the tendency toward mental engrossment and so-called absent-mindedness. The pharmacy student, however; must under no circumstances yield to this tendency. In spite of any degree of concentration of mind upon one subject, his mind must be ever present to the many trivial details which enter into his work at the prescription counter, interrupted as it is by numerous and frequent calls in other directions.

Finally, we are called upon to note that the pharmacist is not infrequently faced by the necessity of acting in an emergency to save human life, and one of the greatest perplexities which attends the framers of the college curriculum is to decide just how far it is appropriate and practicable for them to go in preparing the student to meet these emergencies. Nor must it be forgotten that in this, as in other duties, there is required of the pharmacist himself a rare degree of tact and judgment in observing the delicate requirements arising from his relations to the medical practitioner, to the patient, and to the law. As to the responsibility of the pharmacy school in fitting its undergraduates to meet these conditions, which are in the strictest sense professional, and in certainly ascertaining, before awarding his diploma, that he is so fitted, there is no difference of opinion, even among the differing representatives of the several classes of pharmacy schools. The policy of the New York College of Pharmacy has been based upon the conviction that adequate preparation in this direction cannot be acquired in any short course—by which is distinctly meant a course contracted as regards the space of time covered from entrance to graduation—nor one which does not include, as an integral part, a practical experience in drug-store work.

The relations of the student to "advanced pharmacy" may be considered after our description of means and methods which our college will be enabled to employ under the ideal conditions which we shall enjoy in our new quarters.

The minimum requirements which are deemed necessary by the College as qualification for the safe and satisfactory performance of the duties pertaining to the ordinary pharmacy are two courses of instruction at this college and four years' practical experience in a drug store, two of which may be represented by the two college years. The highest perfection is attained in the grading of the college courses. The drug store training manifestly cannot be so perfectly controlled by the college. The temptation for the proprietor to utilize to his own best interests the services of a clerk, who usually bears him no closer relation than that of an employé, is very great, and such employment frequently tends from rather than toward the educational standard. The system, moreover, to a certain extent, permits of deception on the part of the student. Freely admitting the technical existence of these imperfections, we note that their effects have been greatly overrated by the opponents of this system. The employer after all cannot put the student to tasks for which his previous instruction has not fitted him, so that the college grade is in a rough way maintained even in a drug store. As to the non-professional tasks frequently assigned by employers to junior clerks, it is to be said that their existence proves their utility in the modern pharmacy. However much we may deplore their existence, we must not deny that familiarity with them enlarges the student's equipment to engage successfully in the business.

This combination of the position of employee with that of student presents also advantages of a positive character which far outweigh all possible disadvantages. The close association of the professional and the commercial in the life of the pharmacist gives rise to temptations both peculiar and strong. For the student to meet such temptations, and to scruntinize and criticize the manner in which they are met by associates, while still under the powerful influence of the alma mater, is to provide an important safeguard for his whole future career.

It is designed that the work of the junior college year shall impart to the student a sufficient knowledge of fundamental facts and principles to prepare him for the practical work of the senior year, familiarize him with the implements of his craft, and train his eye and hand for the close observations and delicate manipulations which are to come.

This work covers the sciences of physics, chemistry, botany and physiology, and the arts of microscopy and elementary pharmacy. In each science it is aimed to secure teachers so perfectly familiar with the subject that they can orsake altogether the common highways of instruction and adapt their subjects to the practical needs of this class of students. The result is a series of instruction courses which, from the standpoint of pure educational science, are unique at least in this country, and are worthy of inspection by students of pedagogy. In the interes's of economy, the pursuit, as an end, of the science of the several subjects is eliminated, and such science is followed only because, and in so far as, it is a necessary foundation for practice. At the same time it is apparent that within certain limits, as regards the ground covered, the successful application to practice, of the principles of a science constitutes the crucial test of their possession.

Instruction in physics is limited to twelve lectures and to subjects "of a practical nature, and those necessary to the education of an intelligent pharmacist." Instruction relates to the states and properties of matter, the principles of heat, light and electricity, and to the instruments used in examining and determining the former and in estimating and applying the latter. No special laboratory course in physics is found necessary, the requisite instruction being incorporated into the laboratory course in chemistry. Prof. Arthur H. Elliott, Ph.D., F.C.S., is in charge of this department, as of the department of general chemistry, and is a director of the chemical laboratory. Prof. Elliott's system of teaching inorganic chemistry to beginners is in some important respects unique. No didactic teaching is employed. The class is divided into sections, and each student receives instruction at his own perfectly equipped laboratory table, under the eye of two floor-walking instructors as well as of the professor, who upon the rostrum, performs each experiment simultaneously with the students, with an exactly similar set of apparatus, and upon substances taken from the same stock-containers as those from which the students are supplied. A laboratory guide-book of his own authorship constitutes the important literary adjunct of Prof. Elliott's course. The study is thus made purely inductive, and each student is made to a certain extent the actual discoverer of his principles, at the same time acquiring proper methods of technique. Prof. Elliott is ably assisted by George A. Ferguson, Ph.B., and by Mr. Richard J. Reilly, who has grown up from boyhood in the Professor's laboratory. In the interim of the laboratory exercises, and the same is true of each of the other departments of instruction, the student undergoes a "quizz" by the instructor, his proficiency being determined by a merciless probing, at the same time that any loose ends in the instruction are neatly taken up.

The method of teaching botany, which department is under the charge of the present writer, is the outgrowth of the peculiar requirements of students of pharmacy and of the conditions existing in our own institution, and is quite distinct from any methods employed elsewhere, either in this country or abroad. The subject matter is limited to those details of plant structure which the student will find necssary in his senior year in learning to identify drugs, and the method is based upon the most advanced principles of object teaching and their most complete application.

Thirty lectures of one hour each are illustrated, in addition to the ordinary auxiliaries of chart and blackboard drawing, by a series of student's cards, bearing specimens typically illustrative of the points of structure under discussion. Of each card there are enough copies to supply all the students, and each bears some ten or fifteen specimens. Each lecture is illustrated by one or more of these cards, so that the total number of specimens utilized at these lectures amounts to something over one hundred thousand. Perhaps the quality of the student life represented at our institution is in no way so well shown as by the fact that the annual breakage of this vast amount of such very fragile material, in the hands of so large a class, scarcely reaches five per cent. In the interim between lectures, not only are the regular college quizzes applied in this department, but the class, divided into small sections, study similar specimens in a practical manner by means of dissections and analyses, this practice extending over a period of one hour weekly for thirty weeks. As the examinations must be made both with the simple and compound microscopes, this department is made the occasion for giving the students that most important instruction in the art of microscopy, without which perfect pharmaceutical work can scarcely be performed. Efficient assistance is rendered in this department by Smith Ely Jelliffe, M. D, as instructor, a gentleman whose original contributions to science have established his reputation as botanist, microscopist and physician.

The teaching in physiology, also under the charge of the writer, while restricted, is by no means elementary. Elementary teaching in this subject is entirely inadequate to fit the student for understanding the action of medicines as taught in the senior year. Eighteen lectures are devoted to pointing out the ultimate nature of the bodily functions so far as known ; the important ways in which they become disordered by disease, and the manner in which medicines act upon them ; this instruction furnishing the basis for a scientific classification of medicines.

The work of the department of pharmacy constitutes the objective end of the student's course, to which all that of the other departments is made subordinate and subsidary. By it, the aim is to make a student expert in applying the fundamental knowledge and training elsewhere gained to the practical work of pharmacy, and this, so far as possible, *pari passu* with the acquirement of the former. Here. as in chemistry, there is no didactic teaching, the sections in turn occupying laboratory tables similar to those in the chemical laboratory previously noticed, but specially equipped for pharmaceutical work. The work consists in learning to make practical tests of the purity of the substances to be employed in the pharmacy to make chemical assays, to determine the comparative quality of substances which may vary in strength, to manufacture the simpler substances which it is the business of a pharmacist to manufacture, and to learn the requirements of work at the prescription counter. The method of teaching is very similar to that pursued in the chemical department, the operations being performed by student and professor simultaneously, and competent instructors uniting with the professor in scrutinizing the quality of the work performed. The important element of the system is in the immediate following of the theoretical teaching by its practical application, so that it is impossible for an honest student to fail to so fix his knowledge that it will be retained in his memory, or at least readily recalled when the occasion requires. It is moreover incredible that the student, during the time of receiving this instruction, should not be stimulated to profit by the opportunities for practice afforded by his drug store attendance during the out-of-college hours. The department is under the charge of Virgil Coblentz, Ph. G., A. M., Ph. D. (*Berlin*), whose equipment consists of sixteen years' practical experience in a drug store, as teacher in American institutions and as student in German universities. His assistant is Mr. W. H. Madison, Ph. G., who has had a long experience in practical pharmaceutical work.

It will be seen that the preparation thus afforded the student for entering in his senior year upon the final details pertaining to the work of pharmacy is well nigh perfect, and it may be stated that his fitness for advancement is most regidly determined before admitting him to the senior course. The senior work differs from the junior only in the character of the subject matter and the greater advantages which are offered. The same practical methods are employed, although of necessity they are worked out in a somewhat different manner. In the department of chemistry the students enjoy the advantages of instruction by Prof. Chas. F. Chandler, Ph. D., M. D., LL. D., F. C. S., etc., professor of chemistry also in the School of Mines and in the College of Physicians and Surgeons, not only one of our most learned chemists, but one of the most popular and accomplished lecturers that the City of New York has ever seen. His teaching is restricted to the subject of organic chemistry, and his instructor, Mr. John Oehler, Ph. G., possesses an ability in quizzing and instructing which amounts almost to a genius.

The work of the department of materia medica, also under the charge of the writer, consists of thirty lectures of one hour each, in which the natural order of plants are considered in sequence, their medicinal members classified and grouped as to the character of their constituents and their physiological action, after which each member is considered individually in all its details, a knowledge of which is important in the daily work of the drug store.

In the department of senior pharmacognosy the advantages offered to the student are carried to a point never before attempted in any similar institution. One hour and a half weekly for thirty weeks is devoted to the practical study of the gross and microscopical characters of some 250 drugs of vegetable and animal origin, each student having in hand an ample and typical speciment of each drug studied and being permitted to retain the same for the formation of a permanent *materia medica* cabinet, of the utmost value to him for purposes of reference and comparison in after years.

The senior work in pharmacy is merely a continuation of that of the junior year, in which, however, new examinations and operations are introduced, designed to bring into practice the advanced knowledge since gained by the student in chemistry and *materia medica*.

The final examination to which the students are subjected is of a searching character and the inflexible adherence to principle elsewhere manifested by the college authorities is exercised in the determination of the fitness of all candidates who receive the diploma and the degree of Graduate in Pharmacy. The conspicuous excess in the percentage of successful candidates over that which exists in other similar institutions has been frequently pointed to by those unfamiliar with the nature of the work as an indication of laxity in requirement. The error is entirely natural and to be expected, but yet it is completely an error. Those who are well informed upon the subject understand that its explanation is to be found in the very perfect utilization of instruction hours in the accomplishment of practical results.

Our remaining remarks will be devoted to considering the changing conditions in the pharmaceutical profession and the character of the corresponding changes in the nature of the advanced pharmaceutical instruction which must be made to meet them.

The history of pharmacy shows it to have been an offshoot from medicine. It originated because the broadening of the field of medical practice developed duties which could be perfectly performed only through two separate classes of service, and at the same time a deeper insight into the nature of medical science suggested investigations which could be satisfactorily pursued only by students free from the demands upon time and attention inseparable from such practice. The same considerations have determined the subsequent development of pharmaceutical practice, and it is from their study that we must determine the elements of its future growth.

When the physician's duties were limited to the crudest forms of prophylaxis, to diagnosis by the unaided senses or by means of the simplest instruments and to treatment by the unchanged, or slightly changed, products of nature, and by a surgery more or less barbarous, the assistance rendered by the pharmacist was correspondingly restricted and simple. But the value of his assistance once acknowledged, it was inevitable that his duties should increase, *pari passu* with the addition of new lines of work to the physician's practice. The day is already far gone when the duties of a pharmacist were confined to adapting in his work the results of experience and research on the part of the physician. Long ago was assigned to him the chief task of determining and reporting to the medical profession upon the composition and nature of the *materia medica*, of isolating its active portions. of indicating desirable and undesirable combinations, of regulating preparations, and even of discovering and suggesting additions. So faithfully and so energetically have these duties been performed that the pharmacology of pharmacy has fully caught up with that of medicine, and is to-day in quite as high a state of perfection. Indeed, while much will be done in perfecting this department of pharmacy, no great extension of its field is to be looked for. But while the pharmacist has been busy with this important branch, the physician has been exploring to excellent purpose the fields of prophylaxis and diagnosis. He has determined the causes of many diseases and has demonstrated the possibility of detecting their presence or approach in time to prevent their pernicious activity. To an even higher perfection has he developed the art of recognizing them after their work has been put into operation, and of estimating their force and the extent of their ravages, as an intelligent basis for his measures of therapeutics. But to apply in practice the results thus worked out introduces into his work a fresh mass of detail labor which it is impossible for him to satisfactorily perform, and which sooner or later will inevitably devolve upon the pharmacist. It must be with the physician as it is with the manager of any other business; he must become an executive head, determining the principles and planning the action, but he will be compelled more and more to assign the details of examination, as well as of treatment, to his associates, the pharmacist and the nurse.

It is quite as naturally impossible that the physician should develop all the details of hygienic and diagnostic examinations and do justice to the subjects, as that he should make his own chemical investigations of drugs and prepare his medicines from them. It is not the lack of ability, but of facility, with which he is forced to contend. The physician must keep an office, but he should not maintain a laboratory. He can use the curette and the exploring needle, but it will become increasingly difficult for him to apply to the specimens so obtained the tedious process of culture and microscopical preparation which the occasion calls for. He may secure instructive exhibitions of morbid products, but must depend upon others with proper facilities to estimate their composition when great accuracy is necessary. Upon his judgment must the public rely as to the hygienic effects of the constituents of water and of the atmosphere, but he will be unable to determine their presence or estimate their amounts.

It is then in these directions that pharmacy is to be developed. The really professional pharmacist of the future must be prepared to make water and air analyses; to examine microscopically and chemically articles of food, or even of wearing apparel, or of the soil; to recognize and estimate poisonous substances wherever found, to determine the morbid nature of tissues and the presence of morbid bodies in the tissues or excretions, and in general to perform the physician's detail laboratory work. It is true that not all pharmacists will be able to perform all of these services. There will naturally arise classes and specialists among pharmacists as there are among physicians. But our pharmacy schools must make ready the path for the performance of all these duties. And this will necessitate a closer alliance between our schools of medicine and of pharmacy. Not only does economy forbid that there should be any unnecessary repetition of expenditure in the same field by the two classes of schools, but reason teaches that certain instruction needed by the pharmacist can better be obtained at a school of medicine, and *vice versa*.

As to the College of Pharmacy of the City of New York, she now stands ready to perform her part in the development of the profession as regards this higher education. She has long enjoyed the prestige and embodied the talent, but not until now has she possessed the material facilities for entering upon the work. With the present accession of an equipment which cannot be fully utilized in the established undergraduate work, it is natural and certain that her attention will be seriously given to the work of post-graduate instruction.

THE COLLEGE MUSEUM.

BY H. H. RUSBY.

It would be interesting to review the origin and growth of our museum department, and to associate with its history the names of the predecessors of the present generation of members. The object of this communication however, is to direct attention to the present state and condition of the museum, its assumed objects with the proposed methods for carrying them out, the means at our disposal for so doing, and our requirements for the future.

Long before the removal of the college to its present quarters, its museum had ceased to be fully available for use, owing to the inaccessibility of its contents as the growing demands for laboratory and recitation space crowded it farther into the background. Not only was the influx of additional material checked, but that on hand deteriorated, and much of it entirely spoiled. Hence, our first duty in our new quarters, as the specimens were encased, was to cast out the worthless material and replace it by new.

This work, with the limited time at command, occupied several weeks. The instruction duties of the term then crowding upon us, museum work had to cease, except as to effecting an alphabetical arrangement of the different classes of products sufficiently in advance of their respective study in the pharmacognosy room. After the holidays our time was found to admit of a little further systematic work, and through the generous, efficient and extended assistance of many members of both the senior and junior classes, a satisfactory arrangement has now been effected. Although the work of exchanging and cleaning bottles and relabeling has still to be done, the museum is really in a working condition, and its value as an aid in practical instruction has been beyond estimate, even in the case of the present senior class.

Between 500 and 600 specimens have been recently added, and in no case do these represent duplicates in the strict sense of the term. Handsome collections of duplicates have in the meantime been picked out for the Museum of the Pharmaceutical Society of Great Britain, and for the government museum at Melbourne, in return for specimens already communicated by those institutions. A set of cottons, including herbarium specimens and commercial fibres illustrative of forty-five of the principal varieties cultivated in the United States and South America, has been forwarded to Calcutta for a special study by Dr. Watt, the government reporter on economic products.

Our museum at the present time represents almost exclusively crude or semi-crude products. The productions of pharmaceutical and chemical art are unfortunately almost entirely wanting, and it is greatly to be hoped that arrangements may be made for adding these exhibits of the other departments, partly in separate cases, and partly in connection with the crude products yielding them, in such manner as to represent so many completed series. The Materia Medica Department is itself a frequent sufferer from its inability to refer readily to such products, and probably the other departments would find that some mutual arrangement could be made by which they would receive benefits of little less value than those which they would confer.

So far as our own department is concerned, it might, with the approval of the curators, state its view of the scope and objects of the museum as follows, dividing the subject under a commercial and a scientific heading.

Commercially the great object is to have a sufficient representation of every article of pharmaceutical interest known to commerce, or which, from a knowledge of its properties, is deemed liable to enter commerce in future, provided, of course, that it be capable of exhibit in permanent form. Such a representation should include samples of every variety and grade, the labels, or notes included in the containers, giving accurate comparative data as to value, samples of all articles used as substitutes or adulterants, with samples of the article so adulterated, and all these duplicated for each distinct form in which the article is used. Every dealer connected with the drug trade in any department, every manufacturer, and every pharmacist should look upon the Museum of the College of Pharmacy of the City of New York as a place where he can have answered every question that may arise in his business which is capable of a reply by means of a comparison of specimens. Such an aim is certainly ambitious, but it is by no means Utopian. It not only can be accomplished, but unquestionably will be so in course of time, and it is hoped that this time may be reasonably hastened by such efforts as that here made. There is of course, but one means by which this object can be readily accomplished, and that is by dealers in specialties, as in rubbers, sponges, varnish-resins, spices and oils, contributing full exhibits in their respective lines. The writer observes with confidence, that the chief obstacle in the way of this result is the feeling on the part of dealers that their respective products are too commonplace to prove of value in such a collection, this idea originating in the fact that to them they are common-place, merely because they are daily handled in their business. For no other reason than this, there are scores of standard articles not properly represented upon our shelves. These dealers are not lacking in generosity, as is proven by the fact that they are always ready to contribute those articles which, by unusual size, beauty or curiosity, possess to them the greatest value, and the donation of which costs them a real sacrifice, but which for these very reasons, are not the representative types which give its value to a commercial representation. It is intended at an early day to compile a list of our principal desiderata, for distribution where they are likely to bring returns.

In its scientific aspect it is desired to make the museum instructive in two principal directions, namely, to students and to investigators. The student should find prominently displayed types illustrating the characteristics of the natural orders, at least of those orders most richly contributing to the materia medica, as well as of the individual drugs pertaining thereto, associated with which there should be some method for graphically indicating the distribution. This object requires a great amount of space, with special facilities and contrivances for display, and its accomplishment is not to be anticipated in the near future. But the assistance of investigators is a result as ready of accomplishment, upon a growing scale, as it is important. Indeed, a long step in this direction has already been taken, and the fruits have begun to be put into practical use. The first requisite as a basis for scientific investigation is a perfect and complete authentication of all facts in relation to the material employed, particularly as to its identity. It is notorious that the history of experimental work is so filled with contradictions that it is difficult in many if not in most cases to decide as to the facts. A considerable portion of this diversity is traceable to a lack of authenticity in the details pertaining to the material employed. Our first aim, therefore, is to collect a complete series of specimens specially authenticated in such a way that they can be used with absolute confidence by any one for purposes of verification. The method followed is to have them collected by a fully qualified botanist, the specimen including drug samples and from the same locality, at the same time, and from the same set of plants and—wherever the nature of the plant admits, as in the case of bark from a tree—from the same individual, herbarium specimens. The drug sample and herbarium specimen thus contributed bear a corresponding number or other designation, and each plainly refer to the other as its complement. In this way the writer has, during the last year, collected quite a number of drugs, official and otherwise, of this region, and he has had thus collected and authenticated small collections from Australia, Bolivia, Texas, Florida, Tennessee and Oregon. Arrangements have been perfected for other similar collections from the same and from quite a number of other localities.

A second undertaking in a somewhat similar direction is to collect sets of materials of which comparative examinations are desirable, and to hold these in readiness for supply to any competent and worthy individual making application for them. For example, we have received from Florida samples of Saw-Palmetto fruits prepared respectively by drying in the sun and artificially evaporating. The relative value of these two products has been an important subject of controversy between those who deal in the fruits. Prof. Coblentz at once undertook the investigation of this question and now has the main facts ready for publication.

From the same general region have been obtained barks of the several magnolias in three forms, from large and small trunks and from medium sized branches. These are held ready for examination by any one desiring. Butternut bark has been collected by the writer from root, trunk and branches, and at three different seasons of the year, in order to determine pharmacognostical characters for the determination of the collecting season as well as the comparative quality of the bark so collected. False and true Cascara Sagrada have been collected in sufficient quantity for examination, and Prof. Sayre has undertaken this investigation, as also that of the appearance of root and stem barks of Viburnum prunifolium in the form of powder, also from specimens collected by the writer.

Other similar specimens are ready for distribution, referring to the two species of Prunus (both shade dried and sun dried), Cornus, Hamamelis, Sassafras, Rubus of different varieties, etc. Aside from the utilization of these products in investigations by the outside public, it is intended to make them of service as thesis subjects and subjects for original work by the members of our advanced instruction course leading to the degree of Doctor of Pharmacy.

In conclusion, I may perhaps profitably enumerate some of the more valuable and interesting additions to the museum referred to above. It is intended to furnish hereafter to THE ALUMNI JOURNAL regular reports of all additions to the same as they are made from month to month.

ROOTS.

Polymnia edulis, from M. Bang, Bolivia.

A nearly complete set of Sarsaparillas from various sources, including a roll of Central American, prepared to imitate the Honduras.

American grown Saponaria officinalis.

Exceptionally large sections of Bryonia and Rheum, contributed by Mr. A. C. Meyjes, of the *Chemist and Druggist*.

Rumex crispus and R. obtusifolius, collected separately by the writer.

Rumex hymenosepalus or Canaigee, peeled and unpeeled.

Stillingia sylvatica, collected to order.

Sambucus canadensis, collected by the writer from the same plants from which the roots were obtained which fatally poisoned several children at Tarrytown on the Hudson.

Apocynum cannabinum, collected by the writer.

Three varieties of false Pareira brava, from the Brit. Phar. Soc. Museum.

A specimen of Texan Krameria, collected by Mr. A. A. Heller.

A large number of specimens of ipecac, genuine and false, from various sources.

A specimen of Aristolochia from Mexico, with large fusiform root used as a vulnerary.

RHIZOMES.

A specimen of American calamus, collected by the writer.

Spigelia adulterated with Phlox carolina, several specimens.

Alcoholic specimens of Maranta.

BARKS.

A complete representation of the cultivated Cinchona barks of Java, numbering 95 specimens, uniformly bottled and labeled and the assay marked upon each; presented by Messrs. McKesson & Robbins.

Specimens of Rubus, Viburnum, Prunus, Juglans (both species), Rhamnus, Hamamelis and Liriodendron, collected by the writer as specified above.

Timbo, collected in the Argentine by Dr. Thomas Morong.

Tomé, collected in Bolivia by Mr. M. Bang.

Two species of spurious Quebracho, Piscidia erythrina, bark of root and stem separately; presented by Messrs. Parke, Davis & Co.

Chione glabra from Mr. J. H. Hart, director of the botanical gardens at Trinidad, W. I.

Bocconia of three species, from Bolivia and Mexico.

HERBS, LEAVES, ETC.

Helenium autumnale and Cassia marilandica collected by the writer.

An interesting series of Sennas from various sources.

Adhatoda vasica, Pichi, Naregamia alata, Tonga, Baylahuen and Lippia Mexicana; presented by Messrs. Parke, Davis & Co.

False Chiratta from the Brit. Phar. Soc. Museum.

Leaves of a new species of Erythroxylon, collected by Mr. Bang in Bolivia.

A medicinal Piper from Trinidad.

A new species of dye-leaf from Bolivia, by Mr. Bang.

In other classes I may mention nine varieties of Eucalyptus kino, presented by Baron Ferd. von Müeller of Victoria, and a specimen of Quinoa seed.

GERMANY'S DOCTORS. — Germany, whose population is about 50,000,000, had 21,621 physicians in 1893, against 20,500 in 1892; that is, an increase of 1,521, says the *New York Tribune*. That makes 4.37 doctors for every 10,000 inhabitants, but they are not equally divided througbout the empire; for in some regions there are not even two doctors for every 10,000 inhabitants, while in other districts there are 30 of them for the same number of population. Germany possesses also 915 dentists and 4,978 druggists.

Alumni Association.

'93 NOTES.

THE three Musketeers of the "Mortar and Pestle," L. Meighan, J. Garchow and R. Schaaf are in business at 615 Courtland ave., 2d ave. and 45th st., and 798 8th ave. respectively. Their friendship is of the lasting kind, a sort of a triple Orest and Philades.

BILL FINNEGAN, or, "to give the devil his due," Mr. William Finnegan, chemist and pharmacist of Elizabeth, N. J., is the happy father of an eighteen month old baby-girl, Irene.

THE class prophet E. F. Lohr is still with H. Diestel & Son at 28th st. and 3d ave. He looks more and more like Bill Nye, the humorist.

THERE are rumors that Ira Hopkins, at present clerking at Ithaca, N. Y., is engaged to a young lady whom he met while at college. Who is she, Ira? Don't be bashful—"there are others."

W. REUSWIG, the nightingale of the class, took part in a church entertainment at Somerville, N. J., where he is with Field. It is said that his singing combined with good looks and appealing gestures, touched the hearts of his hearers, particularly one fair lady. Can you blame her?

BEAU-BRUMMEL FRISHBIER and J. Horni are studying medicine at the Long Island Hospital College.

B. SCHRINER and J. Powers are in the classic town of Plainfield, N. J. (It's on the map of the U. S.) They hope to meet many of the boys at the coming commencement exercises to give at least one good long '93 cry, a cry so well known and beloved (?) by the faculty.

CUBBIT is at the head of the prescription department at Hegeman's (corporation) on lower Broadway. He occupies the position with honor to himself and the class.

JAMES WILSON, of Brooklyn, is managing A. L. Goldwater's Willis ave. store at 230 Willis ave., New York.

I DO hope the old class will be well represented at commencement.

Come boys? Bring your sweethearts with you and let's have a reunion! Will you come, boys?

WILL you subscribe to THE ALUMNI JOURNAL and help the '93 column along?

JULIUS TANNENBAUM, Ph. G.,
74 E. 105th st.

'94 NOTES.

WITH the examination so close upon them, it was rather surprising to find such a large attendance of both Seniors and Juniors at Dr. Gallant's lecture. However, I presume this condition of affairs may be attributed to their interest in the treatment of such cases, as they, as pharmacists, are likely to be called upon to temporarily officiate.

IN the city, where physicians are so numerous, such knowledge is seldom put into practice, but in remote districts a pharmacist with First Aid experience is considered an indispensible requisite. In fact, the saving of many lives has been due to prompt and efficient service thus rendered, before the physician has arrived to take charge of the case. In covering this ground various manœuvers, such as affixing splints, uses of the von Esmarch bandage, treatment of wounds, sprains, etc., were explained in detail. The utility of a mixture of Peru balsam and castor oil for cuts and burns (not Byrnes) was advocated by the learned gentleman. A prescription with the proper proportions (30 grs. to ℥) was given to each person present, as a souvenir, so that the "balsam and oil" treatment bids fair to become a popular one, for a time, at least.

UNDER such captions as "Drug Clerks in Trouble," "Knock out Drop Sellers Arrested," etc., Col. Wade has figured conspicuously as a participant. In a recent interview with the colonel he expressed himself as surprised at the audacity of officials who, seemingly ignorant of the regulations regarding the sales of poisons, sought gore at his expense.

It seems that the captain of the precinct being a new man, and hearing much about the "knock-out" drops, decided that the "poor druggist" was the man who was wholly responsible for this state of affairs. He accordingly selected one of his detectives, a former drug clerk, to get the necessary individuals together with Q. S. evidence. The aforesaid drug clerk (?) called on Col. Wade and asked in a familiar way for some chloral to be used in a foot bath. A few drachms was dispensed, labeled poison, and registered. On the following day the colonel was arrested, but discharged when his story was heard. He is now suing the captain.

Two more '94 boys have "shown their colors," to use Mr. Wood's expression, by joining the Alumni. They are Frank Kellar and Robt. F. Murrison, representatives of each of our sections. Clarke has declared his intention of following suit shortly, perhaps on Alumni Day, which has been the customary time for so many of the successful Seniors to hand in their applications, and thus be enabled to elect one of their number Third Vice-President on the same day.

ALUMNI Day this year (May 8th) promises to eclipse those of the past few years. President Graeser has appointed Herold on the Entertainment Committee.

EX-PRESIDENT EHRGOTT has joined the Brooklyn delegation; in fact, he has been with them since February, when he began his engagement with a Fifth avenue firm.

NELSON S. KIRK, PH. G.

9 E. 59th St.

THE following by ex-secretary Linnig, shows what an influence Brooklyn air has had upon him:

"TRILBY."

The land is all ablaze with such a funny craze,
Which came to us across the briny ocean;
It hails from gay Paree, its mission seems to be,
To throw our fair ones into wild commotion.

'Tis proper now, we're told, and not considered bold,
For ladies without any hesitation,
To slip a Frenchy boot, and show a Trilby foot,
To win a lover's looks of admiration.

They'll pull the silken hose from off the Trilby toes,
And ask for close and critical inspection,
The nails they manicure, until they feel quite sure,
Their pretty feet are models of perfection.

And many have the the fad, so very, very bad,
They almost knock their doting lover's silly,
By talking Trilby slang, with naughty Frenchy twang,
And calling their adorers "Little Billie."

They sit in Trilby pose, in fleecy Trilby clothes,
And try to imitate the Trilby graces,
Their sunny smiles have fled, and now they wear instead,
A look of Trilby sadness upon their faces.

Have we not cause to fear, the day is drawing near,
When summer days brings soft and balmy weather,
The all-prevailing craze, may bring before our gaze,
The Trilby in its startling al-t-g-h-r.

Senior Class Notes.

THE class had a very interesting visit to Messrs. Parke, Davis & Co. where they were cordially received by Mr. Clay, the manager of the concern. They were then conducted through the huge storehouse with its thousands of specimens of crude drugs of all kinds and qualities. It was a great sight for the boys, many of whom never had an opportunity of this kind before. Dr. Rusby, under whose guidance the trip was made, has the sincere thanks of the class, as has also Mr. Clay, for the many specimens so kindly given by him, also the employees for their kindness, and last but not least, the pretty typewriters for their smiling glances. It is reported that many of the boys who indulged freely in cassia fistula, discovered its physiological effects later.

PROF.—Give official preparations of carbolic acid.

G.—Suppositories.

PROF.—Give treatment for lead poisoning.

B.—Hypodermic injection of apomorphine.

PROF.—From what is Cod Liver Oil obtained.

C.—Fresh livers of the whale.

CARNEGIE MUSIC HALL has been selected for commencement exercises, and May 9th as the date for the same.

AT a special meeting of the class, the following named gentlemen were chosen for commencement exercises:

Valedictorian—David Mott Wells.

Historian—Frank Chambers.

Prophet—William Miller Kerr.

Poet—Mr. Scharmkow.

SOME good things that ought to be pushed along:

Carter wants that ten dollars, good thing, push it along.

Griffin wants another ten, good thing, push it along.

The dinner is a good thing, push it along.

One dollar to pop for deposit on photograph, good thing, push it along.

Examination day is a —— —— ——, push it along.

Our deposit to insure against breakage, would be a good thing just now, push that along.

Sherman's mustache is a good thing, it only needs to be pushed along.

A token of appreciation to quiz master Ferguson for his unselfish interest and labor in our behalf, is certainly in order and should be pushed along.

THE supply of crackers was not large enough to get around the entire section during the pharmacy quiz, so the empty bag was continued on its journey, the latter part of which being for contributions, it is presumed. "Next time the "Triumvirate" will please take up collection first and buy the crackers afterwards."

THE pin question, the photograph question, and the commencement question are now settled. The next question claiming our attention is the class dinner. It is of the utmost importance that the hearty co-operation of every member of the class be demanded to make this a success, for next to the commencement it is the most interesting affair in all our college days, and one of which every student should feel justly proud. On that occasion all of our professors are permitted to step down from their dignified and exalted positions, and each become one of the boys. If you miss this opportuniiy to paint the town red, it will be many days before another will present itself.

A NUMBER of students have signified their intention of taking the advanced course next fall, and we hope a large class may reward the trustees' labors.

THE work of engraving the invitations for the commencement has been given to "Tiffany" who furnished very artistic designs, in fact, has surpassed all former efforts. This is to be the first class from the new building, and we want to excel all former efforts in every direction, and even "Tiffany" seems to have caught the fever.

CLASS REPORTERS.

AT a meeting held Wednesday, March 13, 1895, President Bailey in the chair, the following business was transacted :

Class Photograph. — Motion was made, seconded and carried that instead of having the Class taken in a body, as heretofore, each student be photographed separately, and the entire class, including also the Faculty, be arranged in a picture to be in accordance with the best of taste as regards neatness, etc.

After the reading, by Chairman of the Committee, of the estimates submitted, the following motion was made, seconded and carried, *viz.*: Moved, that Class accept the offer of Pach, which provided for a photograph, dimensions of which would be of a size suitable for the arrangement as decided upon, price to be $2 00, regardless of any clause as to guarantee of cabinet-sized photos.

Class Poet. — Mr. F. V. Bannon, who was unanimously elected at previous meeting to act as Poet for Class '95, with the plea of excess of other duties, presented his resignation. The resignation, at first not granted, was, after further explanation by Mr. Bannon, finally accepted.

Motion was then made for the choice of Mr. Lewis G. Scharmkow to succeed Mr. Bannon. The motion was seconded and unanimously carried.

Meeting on motion adjourned.

T. P. HEFFLEY, Sec'y.

AT a meeting held Wednesday, March 27, 1895, following matters were considered :

Class Photograph.—The Chairman of Committee made report on the matter, stating that arrangements had been perfected, and urged that students present themselves as soon as possible for the taking of the individual pictures, which they could do at any time. Moved, seconded and carried that report be accepted.

Class Banquet.—Moved, seconded and carried that banquet be held Tuesday evening, May 7 (two days preceding commencement), and that a committee of three be appointed to make inquiries regarding expenses in connection with same.

Following gentlemen were chosen to act as committee : H. G. Steiheuer, G. E. Manville, W. M. Kerr.

Class Flag.—Moved, seconded and carried that a committee of three be appointed to confer with our Faculty with a view to the adoption of our present flag as the permanent design for representing the College.

Committee chosen as follows : R. Gies, D. M. Wells, H. E. Cooley.

Regular adjournment.

THOMAS PHILSON HEFFLEY, Sec'y.

AT a meeting of the Class held in Lecture Room, Wednesday, April 10, 1895, the following matters were transacted :

Class Banquet.—M. Steiheuer, as Chairman of the Committee, stated that prices for *menu* had been received from following parties : Delmonico, Morello, Nevada, Clarke and others.

After reading of *menu* of Delmonico and Morello (in full) on motion, seconded and carried, it was decided that banquet be held at

Morello's, No. 2 West 29th st., New York, on Tuesday evening, May 7, 1895.

Moved, seconded and carried, that present Committee having in charge the matter of banquet, be continued in action.

Visit to Squibb's Factory.—Owing to the nearness of the end of the present term, and the apparent sentiment of the Class against making trips at this time, when amidst the necessary preparations for examination, etc., after presenting matter before the meeting, on motion, seconded and carried, it was decided to defer visit until after examination.

Meeting regularly adjourned.

THOMAS PHILSON HEFFLEY, Sec'y.

EXECUTIVE COMMITTEE MEETING.

AT a meeting of committee, held at the College Friday evening, April 12, 1895, in addition to other business transacted the following sub committee wns appointed by Chairman Zeh :

COMMITTEES.

Invitations—Messrs. D. E. Brown and Wm. M. Kerr to be included in the present committee having this matter in charge.

Floral Decorations—Messrs. James B. Carter, George E. Manville and J. I. Bailey.

Ushers—Messrs. F. P. Bannon, H. B. Ferguson and Thomas P. Heffley.

Badges—This power was vested in the "Committee on Ushers."

Programmes—Messrs. F. P. Bannon, F. L. Chambers and D. E. Brown.

T. P. HEFFLEY,
Secretary Executive Committee.

OUR COLLEGE.

In papers we ofttimes will read
Of colleges that take the lead.
There is one, though, not far away,
Is led by none up to this day.
I have traveled both East and West,
And know the colleges held as best.
For ten years have wandered forth
Over the South and over the North—
Yes, over the isles of the sea,
Where ship or rail could carry me—
Bnt never have or expect to find
A college conducted more to my mind.
With ample room and light displayed,
For each department of the trade,
And, what is rarer far to meet,
Kindness and courtesy complete.
The professors all are highly skilled,
And each department amply filled.
From Chemistry, with its conrse complete,
Then Botany, with its Herbarium so neat,
Materia Medica, with crude drugs at hand,
And its Museum the finest in the land.
Departments of Physics and Pharmacy, I declare,
Cannot be equaled anywhere.
The degree it gives is Ph. G.—
Not only that, but now P. D.
Its graduates are now no longer few,
It includes prominent men, and ladies, too.
Then as year succeedeth year,
May fortune show her favor here.
Then the N. Y. C. P., we can say,
Will always lead and reign for aye.

You may choke me off with quinine,
You may frighten me with squills.
You may try to overcome me
With your tonic and your pills;
But I'm stronger than you doctors,
Though for miles extend their fame.
I'm a little "grip" bacillus,
And I get there just the same.

Oft is a cheerful countenance
Mask of a soul forlorn,
And Wells' russet leather shoes
Now hides an aching corn.

'Twas in the fall of '93
When first the college we did see.
Listen to my tale of woe.
Fellows from most every State
All came here to graduate,
And 'tis of them I'll now relate
My sorrowful tale of woe.

Chorus.

Hard times we've had 'tis true.
No wonder some are feeling blue,
But our mission here will soon be through—
Too true, too trne.
Listen to my tale of woe.
We were first introduced to H_2S,
And by its fragrance were impressed.
Listen to my tale of woe.
Old Botany caused ns much distress,
Pharmacy, Physics and the rest
Helped to make us feel depressed.
Listen to my tale of woe.
Chorus.

The examination held last spring
Was for some a frightful thing.
Listen to my tale of woe.
Their memories they forgot to bring,
Which was a most untimely thing,
And they went sadly home to sing
Their sorrowful tale of woe.
Chorus.

Last fall they had another show
To find out what they did not know.
Listen to my tale of woe.
Some got through O. K. and so
Had a jolly chance to crow
At those who in the soup did go.
Listen to my tale of woe.
Chorus.

Professor Rusby is a brick,
His jokes are always mighty slick.
Listen to my tale of woe.
But when the boys put up some trick
On him, of course he's bound to kick.
In April, though, he'll make them sick.
Listen to my tale of woe.
Chorus,

The day of fate is drawing near,
We hope to get our 'dips" this year.
Listen to my tale of woe.
But there are some who won't, I fear,
And when the verdict they shall hear
Well, off to the "Capt's" and drown in beer
Their piteous tale of woe.
Chorus.

Junior Notes.

As for the last time in the Junior course we prepare this column, it is with mingled feelings of pleasure and regret. Pleasure, that we have been able to contribute our mite to the welfare of the Class of '96, and regret, for the unfaithfulness of many of our efforts.

By the time this issue of the Journal has reached you our examination will have been finished and many of the Juniors started for homes thousands of miles away.

We can only wish you all a successful examination and a happy, successful vacation, with hopes of seeing next year the largest and best Senior Class ever in the N. Y. C. P.

Prof.—What is Dichlamydeous?

B.—A staminate and pistil late plant.

Prof.—No.

B.—(quickly.) On the same tree.

Prof.—You are Dichlamydeous.

B.—Oh! staminate.

The few Juniors who received invitations to the reception given last month by Messrs, Qant, Gugorious and Zriner, and who did not attend, missed a fine time. The large parlors were very tastefully decorated and prepared for dancing, Eiseniger's Orchestra furnishing delightful music. The programmes, another instance of our hosts' ingenuity, were in the form of a prescription, and were most unique. During and after supper Mr. Suade, the celebrated humorist, and Miss Metz, vocalist, assisted in making the hours pass only too quickly.

The reception was a great success in every way, and next year it is hoped we will have a series of them.

Who said we have no tennis players among the Juniors? Already notices of two love games have been handed to the reporter.

One of our brilliant Juniors in physiology suggested that the criminals of New York di(e)gest by electricity.

J. Y. Cantwell.

False Teeth as a Battery.—A medical contemporary relates a case in which a gentleman suffered from mysterious pains in the tongue, which remained inexplicable until an electrician examined the artificial teeth he wore, when it was discovered that the teeth were attached by two different metals, and that these and moisture of the mouth formed a battery and set up an appreciable current. This was prevented by washing the wires with insulating varnish, and no pain was subsequently felt.—*Brit. and Col. Drug*. 1895, 60.

REPLY OF THE THREE MAIDS.

Our poet, in his etherial flight,
Is, in our opinion, out of sight
Of truth—for why should he
Ransack Grecian mythology,
Us with goddesses to compare.
And praise our dark and golden hair?
And yet we fully appreciate
Our chevalier poet up to date.

In future let no bookworm boast
Of the gone days of chivalry.
Those days were at the very most
A precursor of the to be.
Modern boys have more knowledge
And don't deny girls the college.
More courtesy did you ever see
Than in the College of Pharmacy?

Then, in spite of their noise,
We'll excuse such nice boys.
'Tis a sign of good health,
The foundation of wealth.

M. O'C.

AFTER THE BALL.

I.

I stood on the bridge at midnight,
Not a star was in the sky,
The stream, with a silent movement,
In the darkness glided by,
And a vision came before me
As bright as a cloudless day,
In my mind it left a picture
As though seen but yesterday.

II.

How distinctly I remember
The view I had that night,
Of the New York College of Pharmacy
Ablazed with electric light,
The walls seemed filled with knowledge.
And the latch string hung out free,
And I thought to myself, what a difference,
From what it used to be.

III.

The class of '96 I saw
Each student, one by one,
And their eyes with tears were filled to think
Their Junior work was done;
I also saw our charming maids
So sweet they seemed to me,
I called them sister, although perhaps
Its not what they ought to be.

IV.

And Elliott, our professor dear,
Did lecture to us well,
Each student's face was wrapped in smiles
But frowned at the ringing bell.
And at the close of the college day
Each class to the office go,
To say adieu to the honored clerk
Thereby his honors show.

V.

And Coblentz's lecture was slow that night,
But not as clear as it used to be,
And Russell was not quick to close,
Quite strange that seem'd to me;
Then all at once, it seemed that I
By the desk in the library sat—
Tears filled my eyes when Davy said
"He had lost his white straw hat."

VI.

And Madison's marks in pharmacy quiz,
Were such that the boys were pleased,
For answer perfect they surely got
A mark of high degree.
And all at once I heard a sound
Like the ring from a distant knell,
I awoke from my dream of the fairy land
At the sound of the breakfast bell.

—C. W. S., Junior Seat 44.

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Vol. II. New York, June, 1895. No. 6.

AN HISTORICAL SKETCH OF POISONS.

By CHARLES E. PELLEW, E. M.,
Demonstrator of Physics and Chemistry in the College of Physicians and Surgeons, New York, and Honorary Assistant in Chemistry in the School of Mines, Columbia College.

PART SECOND.

THUS far, it will be noticed, we have dealt only with the various vegetable poisons. The mineral poisons are first mentioned by Dioscorides Pedanius, a famous physician of Cilicia, who published a great work on materia medica, and another one on poisons, about the beginning of the second century, A. D. In these works he discusses the properties of aconite, hyoscyamus, conium, hellebore, and many other plants in common use; and he mentions opium in some detail under the name meconium. He describes certain poisonous fungi, tells of the irritant effect of cantharides and other poisonous insects. the use of 'barbarian arrow poison' and the like. And then he gives some details of the effects of gypsium, litharge, burnt and slacked lime and of 'Arsenikon.' The latter, also called Sandarack, evidently refers to the sulphide of Arsenic, afterwards named auri pigmentum, orpiment, for its fine yellow color, and still an article of commerce. He describes it as a golden mineral, coming from Mysia or Pontus, "making sores, burning violently, eating away the hair." In the book on poisons he states that when taken internally, it "gives violent pains in the stomach and intestines, corroding them fiercely," and he recommends milk, decoction of linseed, the juice of the mallow, etc., as antidotes, "to mitigate the burning and produce smooth and easy vomiting."

After this substance was known it was but a short step to discover the white or common arsenic, 'Arsenicum sublimatum' of the early chemists, which accordingly we find mentioned by Geber in the ninth century, and which, from that day to this, has been more used for criminal poisoning than all the other poisons put together.

One of the earliest cases on record is carefully preserved in the French archives under the date of 1384. A wandering troubadour, called Wondreton, was arrested in Paris for acting suspiciously in the royal palace, and under trial confessed that he had been employed to poison King Charles VI of France, and several other members of the royal family. It appeared that he was an agent of Charles the Bad, King of Navarre, who had given full and detailed instructions as to how to proceed. The latter described to him a white powder, arsenicum sublimatum, which could be bought at the apothecary shops in Pampeluna, Bordeaux, Bayonne,' and all the large towns through which he would pass. "If a man eats of it a piece as large as a pea he will never live. Take it and put it into their soups, wine, or meat, whenever it can be done in safety." Fortunately the plot was detected before any harm was done, and the minstrel was duly executed after horrible punishment.

From the early middle ages up to the end of the last century, poisoning as a fine art seems to have centered itself in Italy, and, indeed, we find it constantly referred to in the contemporary literature of all countries, as distinctly an Italian accomplishment. It rose to its heighth in the 15th and early in the 16th centuries, largely under the fostering care of the famous Borgia family. The head of the family was Alexander VI, born in 1431, and elected Pope in 1492, a fierce, licentious old man, magnificent in his intellect and his vices, who devastated all central Italy to gain power and estates for himself and his family. His favorite son Cæsar was a worthy descendant. A report of Capello to the Venetian Senate, A. D. 1500, describes him in the quaint, old Italian, as loved but greatly dreaded by his father, remarkably handsome, very tall and well made, able to strike off the head of a wild bull with one blow, while fighting on horseback. But it also tells of how he murdered his own brother, throwing his body into the Tiber; how he stabbed a favorite of his father under his very mantle, that so the blood splashed in the face of the Pope, and finally says that "All Rome trembles at the said duke, fearing to be assassinated by him."

Although the Borgias were, as thus described, perfectly ready to carry out their vengeance freely, either with their own hands or through bravos, they also devoted much and close attention to the art of secret poisoning. Some of the stories are doubtless exaggerated, as for instance, those about the poisoned gloves, and poisoned fans, or the poisoned candles and torches whose fumes, when inhaled, meant death. But they had, undoubtedly, not only learned the art of mixing tasteless and soluble poisons in the food, but also of applying poisons in new and ingenious ways. We read, and the stories seem to be authentic, of keys to doors and closets, with hidden and envenomed points, and of rings which, on clasping the hand in a particular manner, would inflict deadly scratches. The 'death grasp of the Borgia' became a by-word in Rome at the time; and, while the poisons usually employed were probably some form of arsenic, these latter stories lead us to suspect the use of some bacterial poisons, from the resemblance of some of the symptoms to those of blood poisoning.

An interesting account is given by a contemporary Venetian historian, Marino Sanuto, of the death of Alexander VI, in his seventy-second year, while still in the full vigor of his strength and wickedness. One of his richest Cardinals, Adrian da Cornuto, received word that the Pope, with his son Cæsar, intended to come and take supper with him at his vineyard, bringing the food with him. The Cardinal at once suspected that this was a plot laid against himself, and happening to know the Pope's butler, he had him brought to him, and, with the aid of enormous bribes, learned that after supper three caskets of sweetmeats would be brought on the table, and that the one set before him would be poisoned.

He persuaded the butler to change the caskets, and, after entertaining his distinguished visitors with all the *sang froid* he could muster, he finally implored the Pope to join him in eating the sweetmeats when they were brought on, partaking boldly of his own portion The Pope, suspecting nothing, and fully trusting his butler, agreed, and in a short time felt the effects of the poison and died in agony. "While the Cardinal, who still was terrified. took medicine, and vomited, and received no evil, although escaping not without difficulty."

Naturally these pleasant practices were not confined to one family, and for the next two hundred years political life in Italy was constantly overshadowed by the dread of poison. When Pius III., who succeded Alexander Borgia, died suddenly, less than a month after his accession, his death was commonly attributed to the efforts of some of his disappointed competitors. Some twenty years afterwards one of the noblest and greatest of the Popes, Leo X., was struck down by poison when in the full flush of success. Nor could the danger be averted by any safeguards then in use. Trusty servants, "tasters," amulets charms and antidotes, yet in spite of everything the poisoners made their way. Many of the high dignitaries of the church and occasionally of the State met their fate at the foot of the altar itself, the poison being not infrequently administered at high mass, in the sacred wafer, or in the communion wine. This latter ingenious device prevails to this day in Italy, a priest having been poisoned in this way only last year.

In fact we find, from contemporary literature, that every nobleman of the period kept in his establishment not only a guard of cutthroats, but also a poisoner or two, as a matter of course. Indeed we learn from the memoirs of the Duke de Guise, about 1650, that poison was considered distinctly a gentlemanly weapon, more so even than the sword. The Duke tells us that when it was desired to get rid of a certain Gennaro Annese, who was troubling his government in Naples at the time, the captain of his guard was asked to do the work, and it was suggested that he should stab him. But the captain refused indignantly, saying that he was ready to *poison* him, whenever called upon, but that *stabbing* was disgraceful, and unworthy of a gentleman and an officer. So one of the establishment prepared the dose, bringing it to the Duke in a vial full of clear and beautiful water, and telling him that "in four days' time it will punish all his treasons. The captain of the guard has undertaken to give it to him, and, as it has no taste at all, Gennaro will suspect nothing." The dose was duly given, but by some chance failed to do its work.

This art of poisoning was not, however, confined to political use only, but entered into the daily life of the people of Italy at this time to an inconceivable extent. Secret poisons were commonly sold, and commonly displayed, and were used without the slightest compunction upon the least provocation. In 1659 the attention of the Pope was called to the extreme prevalence of poisoning in Rome, from the reports of the priests in the confessionals, and, by careful investigation, it was found that a large number of the fashionable young married women of the city had associated themselves together with the purpose of ridding themselves of undesirable husbands and other relatives. Their leader was an ugly little old woman called Hieronyma Spara, a fortune-teller and presumed witch, and a clever, well dressed woman was employed by the government to spy on her. She pretended to be living very unhappily with her husband, and, with but little difficulty, bought from her a vial of her famous "drops," which on analysis proved to be a subtle and deadly poison. La Spara was then captured by the police, put to the torture and duly executed, with some of the chief accomplices, while several others, including representatives of the best families in Rome, were punished in other ways.

But she left a worthy successor in the shape of La Tophania, a woman who, for years, carried on a similar but far more extended business at Naples. She, too, was mainly consulted by women, and flooded all Italy with her preparations, the famous Aqua Toffana. She used to ship them in small vials under the name of "Manna of St. Nicholas of Bari," a miraculous oil which was supposed to exude from St. Nicholas' tomb, and possess wonderful curative properties, and so, long after she had been forced to fly for shelter, her goods passed without suspicion. She was a kind hearted old lady, for it is related that when she found women living unhappily at home, but too poor to pay the price of her drops, she would furnish them gratis. She was hunted by the police with more or less success for years, taking refuge always under the wing of the church, but finally, about 1718, was carried away from a convent by a band of soldiers under the orders of the Viceroy of Naples. The whole church, headed by the Archbishop, was intensely excited, threatened excommunication, inflamed the populace, and for a while treated Tophania like an injured and persecuted saint. But after she had been examined, with the aid of the tribune, had confessed to over 600 deaths, and had given an idea of the boldness of her operations by telling of two boxes of poison sent to Rome the day before her capture, the interest of the clergy somewhat diminished, and the woman was executed without much further delay.

It is probable that in all these cases arsenic was the poison mainly depended on, though in what form is not always known. The famous German chemist Hoffmann, in his System of Medicine published in 1729, quotes a letter received some ten years before from Nicola Garelli, physician to the Emperor Charles VI., "about the means used by that infamous poisoner, still alive in prison at Naples, employed to the destruction of upwards of six hundred persons. It was nothing else but crystallized arsenic dissolved in a large quantity of water by decoction, with the addition, but for what purpose I know not, of the herb cymbalaria. This was communicated to me by his imperial majesty himself, to whom the judicial procedure, confirmed by the confession of the criminal, was transmitted."

Other authorities relate that the arsenic was mixed with some peculiar toxines, and thereby obtained its special powers. According to these stories it was customary for the Italian poisoners of the Borgia and later period to rub arsenic into the flesh of some animal, or to inject it into a fig, and then, letting the material slowly putrify, to collect some of the resulting liquid.

Certainly the skill in the concoction of these poisons must have been remarkable, for not only were they perfectly tasteless, but their efficiency could, so at least it was believed, be graduated so as to kill at any desired period, without causing any acute symptoms. In a curious and rare book published in London in 1782, is a passage from Gagliani, an Italian writer of the middle of the century, giving some curious details of the "Aqua di Tufania" as he calls it, which he claimed was a mixture of opium and cantharides. According to him the effects were simply general indisposition, which responded badly to the various violent remedies in general use, and which terminated in a wasting away of the various organs, and finally in weakness and disease of the lungs. It gives a pleasant picture of the times to read that "There is not a lady in Naples who has not some of it lying carelessly on her toilette with her smelling bottles. She alone knows the vial and can distinguish it. Even the waiting woman, who is her confidant, is not in the secret, and takes the vial for distilled water used for mixing with her perfumes."

THE ADVANTAGES WHICH NEW YORK CITY, AS A SCIENTIFIC AND PHARMACEUTICAL CENTRE, OFFERS TO STUDENTS OF PHARMACY.

BY H. H. RUSBY.

In scrutinizing the inducements offered by the various pharmacy schools through the annual prospectus, the intending student often fails to investigate or to consider the conditions presented by the respective locations, independently of the provision of the curriculum. In the case of students seeking a purely scientific or classical education, some of these advantages may safely or often even profitably be ignored, as the desired tendency is rather toward abstraction from ordinary affairs, and to this, partial isolation is conducive. To those seeking a technical education and training, upon the other hand, the opportunity of seeing applied in practice upon a wide scale the principles and processes upon which their future business is to be based, and of having presented before them a wide field of information and choice as to the special direction which they shall select for the exercise of their profession or business, are advantages upon which their future success is often even more directly dependent than upon their training within the school. The advantages of this class which are afforded to students of pharmacy resident in New York City, and particularly to advanced students, are so extensive that it has seemed desirable to present a synopsis of them to the readers of THE ALUMNI JOURNAL.

They really constitute two distinct classes, the first pertaining to the conduct of the business and profession of pharmacy, the second relating to the opportunities for obtaining special scientific instruction, free of charge and outside of the College of Pharmacy, in the branches more or less directly connected with pharmaceutical study.

The existence within one hour's ride of the New York City Hall, of about four millions of people, supplied by more than two thousand retail pharmacies, indicates not only great opportunities for the selection of a business location and for acquiring a knowledge of professional conditions, but also a vast investment of local capital and labor required to supply such pharmaceutical demands. But the supplying of this local demand constitutes after all only a portion of the business in which our capital and labor are employed. The heaviest service which they render is in the employment of this city as a distributing centre to a large part of the United States and to many other countries. Most of the material so distributed being of foreign production, there is involved an extensive import trade, the importation of crude drugs into the port of New York greatly exceeding that of all the remainder of the United States combined, and employing wholly or in great part not less than fifty firms of importers and half as many drug brokers. A temporary position in one of these establishments during attendance at college, even in a subordinate capacity, affords a very favorable opportunity for acquiring a practical acquaintance with the material handled, of inestimable value in supplementing the college course in pharmacognosy, and also of studying a branch of commerce calculated to constitute a good, broad foundation for the subsequent conduct of a retail business. Students who are not thus favorably situated as employees may yet secure ample opportunities for spending all the time available for this purpose in examining importations and stocks under the most favorable conditions, as importers and dealers are more than ready to form an acquaintance with prospective customers. Indeed, the classes at the New York College of Pharmacy are in receipt of more invitations than they can accept, for visiting in a body, collections of this kind. One of the most interesting and instructive days which the writer ever passed in this city was in inspecting the stocks of woods, chiefly medicinal and dye woods, upon the docks and in the warehouses along the East River front. Large importations of the same may often be found at Canal street, and in that vicinity, upon the North River. Drugs and chemicals in cases cannot of course be inspected under these circumstances, but they may be seen after entry, and most of our large dealers maintain show collections of greater or less extent for the interest and convenience of their customers. Under special circumstances, the privilege may be obtained of visiting the Appraisers' Stores, which probably furnishes the best of all opportunities for instruction in this line. In this connection we must not overlook the collection of crude products, vegetable and mineral, on exhibition at the American Museum of Natural History in Manhattan Square, nor the Museum of Applied Chemistry at the School of Mines, both admirably arranged for the use of students.

The manufacture of these crude products being next considered, we note that we have within the same area nearly 450 manufacturing establishments, not including those commercial houses which do a partial and incidental manufacturing business, and exclusive of all manufacturers of instruments, rubber goods and other mechanical appliances. Our list includes manufacturers of drugs and medicines proper, plasters and dressings, acids and chemicals, dye stuffs, paints and oils, glues, varnishes and similar materials. It is true that many, if not a majority, of these concerns are chary about admitting freely to their establishments those who may be or may become competitors. But many of them, and usually the larger and more advanced, are very liberal, while many others will admit our students under such restrictions or conditions as they consider proper. Certain it is that the facilities of this kind are sufficiently extensive to constitute one of the special features connected with our course of study. They are in fact not excelled anywhere outside of the City of London.

It has always been the policy of the New York College to utilize to the utmost these opportunities for instruction in the practical application of theoretical knowledge, and ample time is allowed for this purpose by leaving certain days of the week open, as well as by means of long vacations between terms.

Many graduates in pharmacy find life within an institution preferable to situations in ordinary drug stores, the remuneration being usually much better in consideration of the items of board and lodging. Such situations are particularly favorable to the objects of those desiring to supplement their pharmaceutical by a medical course of study. Even for those intending to engage in the retail business, a practical knowledge of the methods of requisition and supply practiced in public institutions is a very important adjunct to their training. The opportunities for this class of observations afforded by our city are suggested by the fact that the City Department of Charities and Corrections alone is obliged to provide institutions for the care of no less than 35,000 persons as follows: Sick in hospitals, 10,000; insane, 6,500; prisoners, 3,500; treated at dispensaries, 15,000. The institutions in which this work is performed, as enumerated in White's *Medical Register* are as follows: Asylums, 6; hospitals 19; dispensaries 2; prisons and jails not enumerated, perhaps 5. In view of the 35,000 persons cared for in these 32 institutions, the total number under treatment in all such institutions can be understood in a general way by considering that in addition to the above, and not connected with the City Government, we have enumerated in the same work, in New York City and Brooklyn, 150 benevolent institutions, 56 hospitals and 36 dispensaries. To this number must still be added the various government institutions connected with the great department of immigration and with the army and navy posts, as well as a large number of asylums, hospitals, dispensaries and other similar institutions, public and private, pertaining to the cities of Newark, Jersey City, Orange, Paterson, Yonkers, Long Island City and numerous smaller towns of the vicinity. The total number of institutions calling for medical purveying within an hour of the City Hall must therefore run well above 300, and the total number of pharmacists employed must be very great, in view of the fact that many of them require the services of a more or less extensive pharmaceutical staff. It is true that a large number of those enumerated are small and comparatively unimportant, but yet the opportunities for those preparing themselves to serve in, or to supply, such institutions are of great extent and variety. In a similar light may be regarded the 106 steamship lines touching at this port, nearly all of whose vessels, as well as the innumerable sailing vessels with which the harbor is crowded, are obliged to maintain a pharmaceutical equipment of some kind. Free opportunities are afforded to students and visitors for inspecting nearly all of the establishments above enumerated.

Turning from such intensely practical considerations we observe that New York students are no less favorably situated as regards opportunities for scientific instruction on a more liberal basis.

From time to time, the criticism makes its appearance that this community is so intensily absorbed in money getting that it neglects or fails to support such institutions of literature, science and art as might be expected to flourish in so populous and wealthy a city. While it is very true that the results of efforts in this direction are often disappointing, and that there is a very large element in our population, abundantly able but unwilling to become interested in work of this character, still the criticism referred to is not justified by the facts. Upon the contrary, when we take sufficient pains to investigate the work being done, we must conclude that this city is the most important scientific centre of the country and that nowhere else is there an equal amount of time and money expended in developing a taste for pure study and in providing the means for its gratification; and this is true not only absolutely but relatively to the population and wealth represented.

The Scientific Alliance of the City of New York includes the Academy of Sciences, with separate sections of Astronomy and Physics, Geology, Mineralogy and Biology, and a renowned annual course of public lectures, the Torrey Botanical Club, the Microscopical Society, the Linnaean Society, the Mineralogical Club, the Mathematical Society, the New York Section of the American Chemical Society and the Entomological Society.

These together contribute fifteen evening meetings per month, besides numerous and varied field meeting and excursions during the summer season. At the meetings of these societies during the last year there were presented no less than 172 scientific papers, nearly all illustrated by specimens, charts, lantern slides and experiments, and including a large number of topics of special interest to pharmaceutical students. It is to be noted that by the rules of the Alliance membership in any one of these societies entitles the individual to attend any particular meeting of any of the other societies in which he may be interested. It is also to be noted that a movement is on foot, by which the Scientific Alliance is to erect a great building, to possess, besides one or more large lecture halls, separate rooms for the accommodation of the collections and libraries of the different constituent societies, and in which their respective meetings can be held.

Columbia College, besides maintaining great collections illustrative of the different sciences, makes liberal provisions for public afternoon and evening lectures. Some of these lectures are delivered in its own halls, others at the American Museum of Natural History in connection with that institution, and still others in the great lecture hall of Cooper Union. During the year 1894, these lectures numbered 98, and many of them treated of subjects bearing directly upon the higher departments of pharmaceutical work.

The American Museum, independent of Columbia College, provides an instructive and entertaining course of weekly public lectures during the appropriate season, and its valuable collections are at almost all times free to the public. Similar lectures are provided at the same place by the City Board of Education. While the latter are intended especially for teachers, students specially interested in any one of them could easily obtain access thereto.

At the Cooper Union two forms of free public instruction are provided, the first consisting of daily lectures from October 1st, to March 1st, the other of regular courses of instruction which may be made either general or special at the option of the student, and for which no fees are charged.

It frequently happens in our observation that students of pharmacy not intending to study medicine are yet desirous of obtaining special instruction in some medical line. Ample opportunities for attaining such an object are afforded in New York where a number of the most important medical colleges in the country are situated, the most important of them, the College of Physicians and Surgeons, being only nine blocks distant from the College of Pharmacy.

Besides the pharmaceutical library of our own college, the most extensive of its kind in the country, access may be had to the magnificent library of the Academy of Sciences, while the city is noted for the number and size of its general public libraries.

Not least among the conditions marking this city as specially adapted to the pursuit of all departments of medical study, is the fact that we have here published a large number of medical and pharmaceutical journals, the more important of them being in reality the recognized leaders in the country.

Altogether, viewing the exceptional inducements which this locality offers to intending students, it seems eminently appropriate that the liberality and public spirit of the profession should have here erected and equipped a building which is recognized as the type of its class.

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LESSONS OF THE COMMENCEMENT.

Now that the commencement is over the graduates fully equipped in the art of pharmacy, start forth upon their professional career, each filled with noble ambition and lofty purpose.

The traditions of college life have cast a glamor over every obstacle; no problem seemed too difficult, failure was not dreamed of; success, the goal by which all effort is judged, was within reach, and to be had for the asking. Now, face to face with the stern realities of life, the ideal vanishes, and the real begins. It marks an epoch in life. The commencement of a career.

Gradually the influence of the college begins to wane, and in its place rises the influence of the individual.

For after all the training one receives at college, constitutes but the tcols placed in his hands, and with which his career must be carved. These may be of the most approved type, and most carefully adjusted so as to meet the requirements of the hour, but, unless, behind all stands character directing the intellect which operates these tools, the outlook is not a brilliant one, nor pleasing to contemplate.

Hence, you, our brothers, still flushed with the pride of victory, you whom your Alma Mater cherishes as her youngest, her dearest sons, to you, on and through whom, the hope of the future concentrates, the Alumni, extends the hand of fellowship, bids you welcome to the ranks of an honorable calling, and wishes you God-speed upon your journey They would say to you also, cultivate character, be honest, honest in your purpose and your life. Aim high, yet be modest. Do not let the idea that you have learned all there is to know possess you, but keep the words of Longfellow in mind.

> "Let him not boast, who puts his armor on,
> As he who puts it off, the battle done."

Let your labors speak for you. Above all things look upon your chosen calling as your life's work. It will then fill you with enthusiasm and the future will hold no goal that you need despair of attaining.

Equally important is it, on the other hand, to make the most of your talents and opportunities, believing with Owen Meredith, that :

* * * "The value of all things exists, not indeed,
In themselves, but in man's use of them, feeding man's need."

And in tnis connection we believe, the college in adopting a post-graduate course will do more to bind her sons about her than she dreams of.

Why do so many of our students, and usually the brightest and best men, forsake the ranks of pharmacy for some other profession? Does the practice of pharmacy fall short of the theory? Or, is it, having once tasted of the fruits of knowledge, their appetites are aroused for a further repast, and they seek in some other profession to satisfy the cravings which their studies have awakened?

A post-graduate course will remedy this. It will teach them that the practice of pharmacy holds problems deep enough to absorb all the skill and thought that they can bring to bear, and in working out their own career, they will elevate the standard of pharmacy.

REACTIONS OF SOME OF THE NEWER REMEDIES.

Messrs. G. & R. Fritz have published for the Austrian Pharmaceutical Society (Pharm. Post, Vol. xxviii) the following tests of identity of some of the newer remedies:

Agathin (Salicylic Alehyde-Methylphenylhydrazine): White (tinged light-greenish), lustrous, odorless, tasteless scales; insoluble in water, very soluble in ether or hot alcohol, slightly so in cold alcohol or ligroin; melts at 74° C. (165.2° F.), is not discolored even on prolonged exposure to light; heated upon platinum foil it burns without leaving a residue.

Alumnol (Aluminum Naphtoldisulphonate): Fine, light-reddish, nonhygroscopic powder, readily soluble in cold water: acts as a reducing agent; precipitates silver, producing a black coloration. from a solution of silver nitrate; ferric chloride produces with it a deep-blue coloration, even in very dilute solution; its solutions have an acid reaction, and precipitate albumen and gelatin from their solutions, which precipitates however, are redissolved on addition of excess of albumen or gelatin.

Ammonium Sulphoichthyolate (Ichthyol): Brownish-red, syrupy liquid, of a characteristic empyreumatic odor and taste; charred by heat, and if strong heat is continued, it volatilizes without residue: water dissolves it, forming a clear, reddish-brown solution, showing a weak acid reaction, as does also its solution in a mixture of equal volumes of ether and alcohol; pure alcohol or pure ether dissolves ichthyol but partially; hydrochloric acid added to its aqueous solution separates from it a resinous body, which is soluble in ether, as also in water; but from its watery solution it is again precipitated by hydrochloric acid or sodium chloride; on the addition of potassium hydroxide to ammonium sulphoichthyolate the odor of ammonia is evolved; this mixture, when dried and ignited, produces a sulphide of carbon, which yields hydrogen sulphide on the addition of hydrochloric acid.

Argentamine (Solution of Silver Nitrate and Ethylenediamine): Colorless, strongly alkaline liquid, miscible with water in all proportions; hydrochloric acid produces a precipitate of silver chloride; this solution, freed from silver chloride by filtration, emits, on heating with chloroform and potassa, a strong odor of carbylamine; the same solution, freed from silver chloride, leaves. on evaporation, a crystalline mass composed of hydrochlorate and nitrate of ethylenediamine.

Aristol (Dithymol Diiodide): A brick-red powder, having a resinous feel; heated carefully it melts to a brown mass, emitting vapors of iodine; ignited on the platinum foil, it burns up completely with a sooty flame; carefully heated with lime, it produces a sublimate of dithymol, recognizable by its characteristic odor.

Chloral-caffeine: Crystalline mass made up of thick leaflets, readily soluble in water; on boiling its solution a separation takes place of chloral-hydrate and caffeine, the latter, on cooling, crystallizing in the well-known fine long needles.

Dermatol (Bismuth Subgallate): Fine, yellow, odorless, tasteless, insoluble powder; concentrated hydrochloric acid converts it into bismuth chloride; concentrated sulphuric acid has but little effect upon it in the cold, but dissolves it on warming; it is quickly soluble in ammonia water; hydrogen sulphide decomposes it with the production of bismuth sulphide.

Europhen (Isobuytlorthocresol Iodide): Yellow powder of a saffron-like odor and a resinous feel; carefully heated it melts at a little below 50° C. (122° F.) to a yellowish mass, which easily gives off iodine; triturated with water and filtered, the filtrate, on the addition of fuming nitric acid, produces a blue coloration with starch paste; heated with lime it emits the characteristic odor of isobutylcresol.

Lactophenin ; Bitterish crystals melting between 117.5° and 118° C. (211.5 and 212 4° F.); 0.1 Gm. boiled for one minute with 1 C.c. of hydrochloric acid, then diluted with 10 C.c. of water, cooled and filtered, produces a ruby-red coloration on the addition of 3 C.c. of solution of chromic acid; 0.1 Gm. dissolved in 10 C.c. of hot water, cooled and filtered, yields a filtrate which is rendered very turbid when bromine water is added until the solution acquires a yellow color; this turbidty, however, disappears when a large quantity of water is added.

Levulose. (Diabetin): White, or light yellowish, friable mass, possessing a sweet taste; on adding to its aqueous solution, first, solution of calcium chloride, then ammonia until alkaline, and finally acetic acid until of an acid reaction, the liquid remains clear. Its aqueous solution (1 : 10), introduced into a 200 m. m : tube of a polarizer, turns the plane of polarization at least 16° to the left.

Loretin (Orthooxyquinolinemetaidoalphasulphonic acid): Yellow, odorless powder; slightly soluble in water or alcohol at ordinary temperature; insoluble in ether, benzol or chloroform; at 250° C. (482° F.) it assumes a brown color, and 260 to 270° C. (500—518° F.) it begins to decompose with the emission of iodine vapors; ferric chloride produces an intense green coloration.

Losophan (Triiodometacresol): White, crystalline powder, which is insoluble in water, difficulty soluble in alcohol, readily soluble in ether, benzol and chloroform, or fatty oils; melting point, 121.5° C. (250.7° F.); heated, it gives off vapors of iodine; concentrated solution of sodium hydroxide changes it to a greenish-black, amorphous substance, which is no longer soluble in alcohol.

Lycetol (Dymethylpiperazine Tartrate): White, odorless powder, easily soluble in water; melting-point, 243° C. (469.2° F.); solution has an acid reaction and a lemonade-like taste; heated with burnt lime it yields a distillate which contains free dimethylpiperazine, the latter possessing, in a high degree, the power of dissolving uric acid.

Lysidin (Ethylenethenyldiamine ; Methylglyoxalidin) : White, very hygroscopic crystalline mass, of a peculiar odor : readily soluble in water, or alcohol, almost insoluble in ether ; melting-point, 99–100° C, (210.2–212° F.) ; the aqueous solution is strongly alkaline ; ferric chloride produces a brown precipitate, and zinc chloride a white one ; mercuric chloride precipitates a double-salt, melting at 162° C. (323.6° G.); on heating the solution with silver nitrate, a precipitate of metallic silver is formed.

Malakin (Salicylaldehyd-Paraphenetidine) : Yellow, odorless, tasteless needles, melting at 92° C. (197.6° F.) ; very little soluble in water, but soluble in hot alcohol or ether ; on prolonged boiling with water, or on the addition of acids, or acid salts, the characteristic odor of salicyl aldehyde is evolved ; if 0.5 Gm. of finely pulverized malakin is mixed with 20 or 25 C.c. of boiling water, shaken, cooled and filtered, the filtrate gradually yields, on the addition of 1 or 2 drops of ferric-chloride solution, a dirty-violet color (salicyl aldehyde) or a cherry-red color (phenetidine).

Migranin (Antipyrine, Caffeine Citrate) : White powder, readily soluble in water ; gives the reactions of both antipyrine and caffeine ; distinguished from antipyrine by the fact that its aqueous solution, on the addition of a solution of sodium nitrate, acquires a greenish coloration without the need of the addition of an acid.

Phenocoll Hydrochlorate (Amidoacetparaphenetidine Hydrochlorate) : White, light powder, consisting of minute needles of a sweetish taste; 0.5 Gm. forms a clear solution with 15 C.c. of water ; soda solution precipitates the phenocoll base, as a white crystalline mass ; its solution, boiled for a few minutes with a few drops of hydrochloric acid, gives all the reactions, though more faintly, which phenacetine exhibits under similar conditions.

(To be continued.)

Malakin.—(Salicyl aldehyd para phenetidin has been used by Abernethy, (Edinburgh Med. Jour. Feb 1895). in the pyrexia of rheumatism and pneumonia.

It is indicated in cases where the phenacetine or salicylic group have been found beneficial, especially the latter. Its administration in the writer's experience has not yet been altered with any bad results. The dose for an adult is fifteen grains three times a day.

Malakin is decomposed by the action of weak inorganic acids into salicylic aldehyd and para phenetidin. This change occurs when malakin s taken into the stomach, and according to Schmudenberg, the salicylic aldehyd changes to salicylic acid and may be detected in the urine.

SIXTY-FIFTH ANNUAL COMMENCEMENT OF THE COLLEGE OF PHARMACY.

The Sixth Annual Commencement was held at Carnegie Hall on Thursday evening, May 9, 1895.

Accompanied by the strains of martial music and amidst the greatest enthusiasm from the vast audience assembled in the hall, the Graduates under the able leadership of Mr. H. W. Atwood, Chairman of the Entertainment Committee, marched down the centre aisle and took seats upon the platform, the centre of which had been reserved for the Faculty and the invited guests. In the absence of the President, Mr. S. W. Fairchild, Prof. Chas. F. Chandler, officiated as the presiding officer.

After a musical selection rendered by the Seventh Regiment Band, Prof. Chandler introduced the Rev. Philip A. H. Brown, who opened the exercises with a prayer and benediction.

Then after the rendering of a selection from De Koven's Robin Hood, Prof. Chandler welcomed the audience in the following address:

Ladies and Gentlemen:—

It is my pleasant duty to-night to extend to you all, a greeting and a welcome to this, the Sixty-fifth Annual Commencement of the College of Pharmacy of the City of New York. We are delighted again to see the Trustees of this College gathered here, the members of the College of Pharmacy, the Alumni, and all the friends of the students and the faculty, our graduating class; and we are glad to welcome here the class of '96. The class of '96 occupies to-night, a very elevated position (top gallery). We are delighted to have them here, but we hope that they will restrain within reasonable limits, their youthful energies.

It is my first duty to congratulate the college and all its friends on the work of the past year, and the progress which the college has made, I shall have the honor to-night of conferring the degree of "Graduate in Pharmacy" upon 105 young men, and when we look back, and remember that in 1831, three young men presented themselves to receive their diplomas, we are filled with satisfaction that the college has had such a healthy and vigorous growth. I may say for the benefit of those who are not especially familiar with the details of the working of the college, that we have had during the past year, 325 young men attending the exercises of the college. In my own experience, I can say that this is a most wonderful development. It is, now, I think, 25 years since I first became connected with this institution. We then had a class of 33 students, and hired a single room in the old university on Washington Square. The interes manifested in this enterprise by the professional pharmacists of this city, and the earnest and faithful work of a dozen or 20 members of this fraternity have succeeded in bringing that little school out of that hired room, first into its building on Twenty-third street, and now recently, into its elegant quarters in Sixty-eighth street, and I think it my first duty to-night to express the thanks of the faculty in particular, and the students in general, to the architects who planned so successfully the building which we now occupy, Messrs. Little & O'Connor, and it is with great pleasure that I claim one of the firm as an old student at the School of Mines. Our buildings there could not be more commodious, or more convenient. They are admirably arranged, and we find after a year's experience, that we have nothing left to be desired. They are not only large enough to accommodate all the students which we now have, but we have room for nearly as many more; and the ventilation, that mysterious subject upon which so many have theories, and upon which so few can shed any practical light—the ventilation even, has been so well arranged that with 100 students working in the laboratory, and liberating various chemical gases and vapors, we find that the air never becomes disagreeable or offensive. It is really the first occasion on which I have seen a chemical laboratory properly ventilated. Our lecture room seats 600 students, and gives every one perfect opportunity to view the experiments performed on the lecture room table or the diagrams that are hung upon the walls.

I should fail in my duty if I did not take this occasion also to thank the generous friends of the College of Pharmacy—the apothecari s of New York and the wholesale druggists and the dealers in druggists' supplies who generously came forward and contributed to the needs of the college when it moved from Twenty-third street to Sixty eighth street. $35,000 was generously contributed by these gentlemen, which materially aided us in making this expensive change in our quarters. Our Treasurer, Mr. Fraser, informs me that he has just balanced the books of the college and that he finds that the college is to-day $50,000 better off than it was 20 years ago. I would say for the benefit of those who are not familiar with the details of the college, that we have in this institution a remarkable illustration of what can be accomplished by the labors of those within. Most of our large institutions of learning have been developed by the assistance of those without, who have contributed large sums of money, to make it possible to occupy roomy buildings; provide salaries and establish chairs. The College of Pharmacy is one of the few institutions which has been developed from within; by the labors and exertions of those immediately connected with it; its Trustees and its faculty; and with the exception of this $35,000. which was contributed within the last two or three years, I think I am correct in saying that it never had received any considerable gift or bequest from without. At the same time, I am reminded by the Treasurer of the college that we need a great deal more, and it was whispered to me that I should not lose so open an opportunity to mention to the citizens of New York, the necessities of the College of Pharmacy. We have been very bold in making this move from Twenty-third to Sixty-eighth streets. We have actually incurred a debt of $129,000, upon which we are at this moment paying interest, and in order to enable us to move along comfortably during the next six months, we need a gift of at least $25,000, a very trifling sum for this city to contribute to an institution which does so much for the material welfare of the entire population.

Speaking of those who have assisted in the development of the college, I feel it my duty to mention the Association of the Alumni. All the graduates of the College of Pharmacy have united in forming an Association of the Alumni, of the College of Pharmacy, of the City of New York, with a view of keeping up their interest in the college, and to assist the college in every way in its mission of usefulness to their profession. They publish a monthly journal indicating the progress of the sciences especially connected with their profession. They offer prizes which will be awarded to-night, by-and-by, to certain students who have passed the best examinations, and I feel it my duty to thank them for the assistance they have given the College in the past, and the benefits we expect to receive from them in the future.

I would also say that another departure has been made in the development of the College of Pharmacy. It has been decided now to establish a post-graduate course, which will be opened this autumn. We propose to offer practical instruction in chemistry, physics, materia medica pharmacognosy. This instruction is to be given under their immediate direction in the laboratory, by the members of the departments. The course will be largely investigation. It will be open to graduates of our College of Pharmacy, and also to graduates of other institutions which maintain a course of instruction of like grade and value. It has not yet been decided what the degree will be. It is a question still under discussion, whether it will be best to confer the degree of "Master of Pharmacy," or "Doctor of Pharmacy," to those who successfully complete this year's course in post-graduate studies.

We have developed from the little school with its one room in Washington Square, to this elegant establishment in Sixty-eighth street, and, perhaps, it would not be improper for me to tell you what are the hopes and the ambition of those who are now interested in the development of this institution. It is our hope that the College of Pharmacy, of the City of New York, will continue to maintain the foremost position as a College of Pharmacy, and more than that, we hope that it will become the centre and headquarters of everything relating to the science and practice of pharmacy and all the cognate sciences in the City of New York; that it will be a rendezvous; that our libraries, and our museums, and our laboratories will be frequented by everyone who takes the slightest interest in any one of these sciences, which are here taught.

Perhaps it would be proper for me to tell you why we are about to confer the degree of "Graduate in Pharmacy" upon these 105 young men that you see seated here. It is, because, they have devoted two years' of diligent study to all the subjects connected with their profession:—physics, chemistry in all its branches, inorganic and organic analytical, botany, phosiology, materia medica, and pharmacognosy, theoretical and practical pharmacy. All of these subjects they have been obliged to study in the lecture room, in the recitation room, in the laboratory; and upon all these subjects they have passed satisfactory examinations.

Perhaps it would not be out of place for me to ask you to drop a tear of compassion for the young men who are not here; those who, though they had worked diligently, were not quite able to pass all those examinations, and upon whom we are very sorry to say, we cannot to-night confer the degree. The 105 you see before you represents those who were successful.

There can be no question as to the benefit to the pharmacist of such an education as I have described It qualifies him for his life work; it gives him that self-respect which comes with the knowledge of professional readiness; it makes a professional man of him; it admits him to a guild, a fraternity; it makes him a man of science. Science involves accurancy. It has been said that modern science consists simply in accurate measurement, and we have just had a most interesting illustration of the value and importance of accurate measurement. You have all read of the great discovery of Lord Raleigh of the constituent of the atmosphere which had hitherto escaped detection. Lord Raleigh was engaged in a very careful investigation of gases, and among other things, he determined with the utmost accuracy, the specific gravity or measurement of these different gases, and he noticed that when he discovered the specific gravity of the nitrogen gas which he extracted from the atmosphere, it was heavier than the nitrogen which he extracted from chemical compounds, and although he tried it several times, there was invariably this difference. The accuracy of his experiments made him feel certain that it must be due to a character in the gases, and applying the most laborious methods of modern science, he was able to discover that the nitrogen extracted from the atmosphere contained an element that had up to this time, escaped detection, although many of the most distinguished chemists that had ever lived had failed to discover it. Cavendish, one hundred years ago, had this very gas under observation, but had not detected it; and more recently, chemists conducting the experiments in Washington, had not recognized it; but the extreme accuracy of the experiments of Lord Raleigh enabled him to make what is regarded as one of the most brilliant discoveries of recent times. Columbia College has decided to award to Lord Raleigh the Barnard medal for the most important discovery in physical science made within the last five years. The $10,000 Hodgson prize is also to be given as a tribute to the value and importance of accuracy in scientific work which has never been equaled, and, speaking again of science and of the benefit which these young men must have derived from this two year's thorough training in scientific observation, I may say that a few days since, at a public gathering in Paris, Barphalous, the famous chemist, observed that scientific method is at present, and in fact always has been, the main if not the only source of both moral and material progress of mankind.

I might enlarge, if I desired to occupy more than my share of the time devoted to our Commencement Exercises, upon the benefit to the community of educating thoroughly, the pharmacists graduating year after year—one hundred young men thoroughly trained in everything that relates to the science and practice of pharmacy. Think of the satisfaction it must be to the physician to know that when at the bedside of his patient, he writes the prescription, that that prescription will be honestly and intelligently prepared by the pharmacist; that he can rely upon whatever is sent out by the pharmacist in response to those hieroglyphics in doctors' latin, which he sends to him—and think of the benefit to the patient of always receiving exactly what the medical attendant deems necessary for his recovery; and again, the benefit of the example to the community of men who prepare themselves for their calling; men who devote years of precious time to preparing themselves for the special occupation to which they intend to devote their lives.

There is one word that I wish to say before I sit down, in this connection. You are probably aware that Boards of Pharmacy have been established in many of the States, and in this State, and that before a pharmacist can practice his profession in a community, he must go before that Board of Pharmacy, and pass an examination. I wish to take this public opportunity to make a statement that I hope that in the future, these Boards of Pharmacy which are established in this and other States, will insist upon it that every candidate who comes before them must come provided with a diploma from some well organized and reliable institution, to show that the young man who presents it has really devoted a reasonable amount of time to acquiring the knowledge and experience which fits him for the calling. We all know what can be accomplished by cramming for examinations, and the mere passing of an examination is not in itself sufficient evidence of the qualifications of a pharmacist.

The Roll of Graduates (see page 168) was then read by the Secretary of the College, Mr. J. Niven Hegeman, and Prof. Chandler in conferring the degree of Graduate of Pharmacy, said: I alluded once or twice to the fact that we had 105 young men about to graduate. I should have said more properly, one young lady and 104 young men. The truth of the matter is, the young lady has been so successful, and has stood so high in all her studies that I think we were rather loath to have to confess that she did not belong to our sex, and we have counted her as one of the boys.

In accordance with the charter of our college and by virtue of the authority vested in me as your acting President, I now confer upon you the degree of "Graduate in Pharmacy," and hereafter you will be entitled to all the privileges, and held to all the duties that attach to that degree.

Before you sit down, I would like to say that I preside to-night owing to the absence, in Europe, of the President of the College, Mr. Samuel W. Fairchild, and that I have just received a cablegram from him dated at Carlsbad, in Germany, begging me to give his congratulations and his best wishes to the graduating class.

You have ever been faithful to the teachings of your instructors since you have been in the college, and all we can say to you now is that we hope in your future career, you will give evidence of having not only embodied the information which we have attempted to give you, but that you will also carry away with you the highest principles of honor and equity in your relations to one another and to the public, and I hope that those colored bottles in your windows will forever serve to show where honest dealings may be found, and that you will be honorable to yourselves, your professional brethren, and the world.

PROF. CHANDLER: The address to the graduating class will now be given by Mr. John L. N. Hunt, of the Board of Education, of the City of New York. I have the pleasure of introducing him.

MR. HUNT: Mr. President, Ladies and Gentlemen—I thought I had something to say before I came, but Dr. Chandler has said it, and that relieves me of a very great burden of responibility. A few mornings ago, by the enticements and allurements of one of your trustees, who can never be withstood in anything he undertakes, I was induced to visit the College of Pharmacy for an hour or two, and of course in that limited time, I took it all in, that is, the building; but not very much of the course of instruction, I fear. At least, I should not like to have an examination paper gotten up by this Faculty, placed before me upon materia medica, pharmacy, pharmacognosy, analytical chemistry or in any other department here. I think I would fall very far below zero.

I want to congratulate the people of New York upon two things. First of all though, I want to narrate the saying or the alleged saying of one of our old Greek philosophers, who says, that he thanked the Gods for three things. You will discover in one of these sayings that he was opposed to womankind. He said he thanked the Gods that he was born a man, and not a woman. Second, that he was born a wise fellow and not a fool; and third, that he was born a Grecian and not a Roman. Now, I want to congratulate the people of New York, that the College of Pharmacy was born in their city.

I confess to you—I not only acknowledge my faults, but I confess my sins—in having been so long a citizen of our beloved city and a large part of the time engaged in various kinds of educational work that have come up in so small a degree to the standard of public knowledge as an educator, that I did not comprehend in any very great, marked or adequate degree, the valuable work—the work that cannot be told in writing or in words, that I believe this College has been doing, and that I know it is doing to-day. If the citizens of New York, my friends, understood the work that the College of Pharmacy has on hand, and their method of doing that work, they would at once recognize it as one of the most important educational factors in this great metropolis of the western hemisphere. Dr. Chandler has narrated how from a small beginning, they have risen step by step, through inadequate support, and by discouragements, to their present status as a recognized educational factor in our midst. Well, this College in that respect, is only a type, is only a specific illustration, ladies and gentlemen, of the work of this great nation, and of this city. Why, to think in how short a time man has, here upon Manhattan Island, subdued the forces of nature, and how this city, a little more than one hundred years ago, was a green silence reposing at the gate of the sea; but to day this cosmopolitan life rushes through its veins, and the nations of the earth make it the theatre for the splendid rivalry of learning, industry and art. To think, upon a broader sketch, how but about one hundred years ago, all there was in a governmental sense, of our beloved country, all there was of civilized colonial America, was a mere strip extending from what is now known as Maine, on the north, along the Atlantic coast, down as far as southern Georgia, and less on an average, than one hundred miles in width, and containing in all but three millions of people; and how to-day it extends from the Atlantic to the Pacific, not a strip of one hundred miles, but a continent of three thousand or more, and how the three millions of people have become sixty-five millions, and how the nation stands in prestige and in power; the first in many respects, among the nations of the earth, and, so fellow citizens, not only has this been so in enlargement of territory, in the acquisition of great national resources, but it has been exemplified in the foundation and the maintenance of great institutions of art and of learning, in law, theology, medicine and pedagogism, so that to-day we do not consider in your particular line, for instance, in that of pharmacy, or medicine, or surgery, we do not consider that we have any superiors as a nation upon the face of this globe. It is a recognized fact now, to-day, that America has upon its Roll of Honor, surgeons of the first rank in the annals of that great art. We no longer look to Germany to furnish us with all of the skilled pharmacists and physicians of learning, but we cultivate them here. It used to be supposed that in order to get a man well versed in pharmacy, and in the pharmacists' art, in the dispensing of medicines, in the ability to tell their constituent elements, that we must get an educated German pharmacist. This day, by reason of the enterprise, the public enterprise, and the skill, and the indomitable scholarly perseverance of America's scholars, has gone by, and we now, Mr. President and Fellow Citizens, plant the seed of scholarship in this particular department, to celebrate the anniversary of which, we have come together this evening. We plant the seed of learning; we notice the shooting forth of the cotyledons of the plant so to speak. We see how it rises, breaking the soil to greet the sun; we we see it blossom and clothe itself in the green leaf; we see it rise, step by step, until it brings forth the scholarly and cultured graduate, the full fruit, the fruition of hopes found at first in the seed planted in the institution. A nation, I mean to say, Ladies and Gentlemen, that a nation becomes great when it contains within itself the seeds of its own greatness, the power of execution; not only the *suaviter in modo*, but the *fortiter in re* and we have exemplified in this institution how from a small beginning about 67 years ago, and in the little room upon Washington Square, amidst all the discouragements there was with the growth of the city, northward, a transmigration to Twenty-third Street, and with the unparalleled growth of the city still northward, as we have had it in the last quarter of a century, a further transmigration to Sixty-eighth street, in quarters which are not to be surpassed in their particular line, anywhere within the United States of America.

I do not begrudge anyone pleasure, but I want to say to you all that I do not intend to part for either love or money with the pleasure I felt a few mornings ago in traversing from the cellar to the garret, through the various departments of the College of Pharmacy, upon West Sixty-eighth street.

If the people of New York knew what the faculty were doing; if they knew their method of instruction; if they fully appreciated this to its maximum worth, I say that there would not be six months go by until their would be an endowment fund of from a half a million to a million of dollars, with which this institution should go on conquering and to conquer in greater, nobler, wider fields of scientific research. This institution richly deserves it; it ought to have it; and it will have it. Dr. Chandler omitted a little part of the thunder which I had prepared. He ommitted to state, I believe, and if I am incorrect, the Doctor will correct me now, that at the last session of the Legislature, the Board of Trustees succeeded in having the charter amended, the charter of this institution, so that the Legislature might in its corporate capacity recognize the possibility and the probability that this institntion would grow, and so they amended the charter, among other things empowering this institution to own real estate and property of the value of one million dollars instead of the restriction in the old charter of but three hundred thousand dollars, so that you see that the Legislature which has always an eye to good things, those that are standing round about and those that are obscure, had a prophetic vision that the College of Pharmacy some day would have a million dollars to own, and that it had now already perhaps outgrown its original limits; at least, it gave the power which was but a slight hint to the citizens of New York to walk up to the captain's office and settle, and they will do this. Also by a recent amendment, they have given the institution the power, as the Doctor intimated, in addition to the degree of "Graduate in Pharmacy," the power to confer upon its graduates, its post-graduates, the degree of "Doctor of Pharmacy," after January 1, 1896. There are no "Doctors of Pharmacy" here to-night, except the faculty, but if you want to see the breakers break, just step in about a year from now, or two years, in that direction. They are empowered to grant the degree to such of its former graduates or other persons as have attained high distinction in the profession of pharmacy or have produced satisfactory evidence of superior attainments, or have contributed by their labors and their writings to the stock of professional knowledge in any of the branches of scientific knowledge. You will see that this is an enlargement of the powers, and authorizes this institution to grant this degree not only to those who pass a post-graduate course, but also to those who have produced satisfactory evidence of superior attainments in authorship or otherwise. This at once places this College upon a level with Yale, and Harward, and Columbia, the University of the City of New York, and other such institutions, in conferring degrees upon gentlemen of scientific or scholarly or literary attainments although they may not have passed through a certain post-graduate curriculum of study. I dare say that they will be coming from the East and the West and the North and the South to discover how these possibilities may strike them, and if the experience of the Faculty is as is the experience of some of our older institutions of learning, some of the professors will wish they had never been born.

Now, I have not time to dwell, or even to speak of in a limited degree, a large number of the points upon which I would like to dwell, but I want to call the attention of the audience to this fact, that I was particularly struck, and I hope that under the circumstances you will pardon me for alluding to myself, because I am the victim. I was particularly struck in passing through that institution with one thing, and that was this: how closely these gentlemen embodied in their methods of instruction, the principles which underlie scientific instruction in any and every school from the kindergarten to the university and that is this, according to the principles laid down during the lifetime of Apostalaso, who was born in 1746, laid down more than a hundred years ago, the cardinal principles upon which elementary instruction is based, and which must always apply to instruction when it is delivered or imparted by the hand of a master-workman — that you should proceed from the simple to the complex. I noted, I cannot elaborate upon it again — that they should proceed from the concrete to the abstract, and that they should proceed from the known to the unknown. Now, I have visited many schools of mines, and schools for applied science throughout the United States in bygone years, and I have never seen, my friends, and I want to say to you, that although in the legal profession, I am not paid for saying these things. I have never seen an institution which from an observation made in its various departments and laboratories, and with the apparatus and appurtenances that they have, and an examination into their course of study. I have never seen an institution that more perfectly embodied these great principles that underlie all instruction. They have the laboratory before them—they proceed from the known to the unknown, and before the professor announces a principle as a duly established fact, by a series of experiments along the lines of investigation at hand, he leads the pupil gradually up to the final conclusion and to the enunciation of the principle involved, so that you see here throughout all of its departments, in the department of materia medica, in the department of pharmacy, in the department of pharmacognosy or knowledge of the materials of which the drugs are composed, in the laboratory. in the chemical department, everywhere you see here exemplified these great principles that underlie the proper process of instruction.

I want to call your attention to one other thing, at least, and that is this, that it is well recognized in every intelligent community, and by a discriminating public that every profession that has to meet with the recommendations, and with the sympathy and support of the public, must have at the bottom of it, correct moral principles. There is the highest code of morals, there is the highest code of professional honor we all understand, among the members, and governing the members of the medical profession. You do not take your cases involving your rights of property or person, to an attorney or a counselor who is of low grade in character or in reputation. There is a high degree of professional ethics in law, and in medicine, and of course. in theology, but I want to say that there are equally high degrees of professional honor imposed by this institution, and embodied in its code of ethics, upon the young men who graduate here.

Let me read one or two—a few. First of all, they agree that they will accept a standard of excellence in their professional work, and in the dispensing of the preparations with which they have to deal in their daily vocation, and that will not depart from that professional high standard imposed by the highest authority of the country except where higher authority if possible, has proved some other process more reliable to attain the same end. You see at once, this gives a guarantee for professional accuracy. Again, this class pledges itself that they will allow no quack medicines that are gotten up simply to sell, to take the place of the v l established product of the highest authority, and that they will discourage, as far as possible, the professional use of quack medicines, and save you your time, your money and your life, and another very virtuous thing I notice, ladies and gentlemen, that they distinctly repudiate the brokerage processes so well known in some of our professions. They distinctly repudiate the practice of allowing physicians a percentage on their prescriptions as derogatory to their profession and unprofessional. And again, since the professional training of the pharmacist does not include those branches which enable the physician to diagnose and treat diseases, they shall in all practicable cases decline to give medical advice, and refer the applicant to a regular physician. Again, and here I strike its scholastic feature for which I plead and claim that we have come to that place, and long since have come to it in American education, where to meet the demands made upon our American life, we must have special schools of instruction in special departments, it has come to that pitch that not everyone who is determined to be a teacher, can be a teacher, and I would echo along another line, remarks made by Prof. Chandler, and would allow not only no druggists to dispense medicine without he was thoroughly educated and had the seal of a well established institution upon his diploma. I would echo that along another line, and if I had my way, I would allow no teacher to go into the public schools of the United States without they had behind them, the authority, not only of law, but the authority of a well regulated and honorable institution, qualifying them, stating that they were qualified for the high office of instructor in any particular branch. And here is one item of the code of ethics. "The growing demands of the age," say this faculty, "require that those who follow the profession of pharmacy, should be educated up to a higher standard, and therefore, we consider it our duty individually and collectively to encourage the advancement of knowledge in our profession generally, and particularly, by stimulating our assistants to attend the lectures of the college."

Now, ladies and gentlemen, I will not weary you by extended remarks. I again desire to congratulate you as citizens of our beloved city that has made such rapid strides along all the departments that adorn our national and our municipal life. Give your influence and support to this, one of the noblest institutions, doing more in its line of scientific research and scholarly work, than any other of its kind in the United States.

Now, young gentlemen of the graduating class, I congratulate you that you have to-night received those evidences of your high standing, and of your culture in this department, and of the valuable work that you have done, and of the noble results you have achieved during the two years which you have spent in this institution, and I am sure, ladies and gentlemen, that if your experience is the same as those who have strong attachments to their beloved alma mater, that you will always recognize the value of the curriculum of study that has been imposed upon you, and of the stand which you will take amongst the druggists and pharmacists of the world.

PROF. CHANDLER: The Roll of Honor will now be read by Prof. H. H. Rusby, on behalf of the Examining Committee.

PROF. RUSBY: Ladies and Gentlemen: It is probable that the desire to be represented upon the Honor Roll is not altogether absent from the thoughts of any student, either the worthy or the merely ambitious, and inasmuch as students of both classes, those who are really worthy and those who are merely ambitious frequently succeed in getting their names placed upon the Roll of Honor, it becomes a duty requiring no small degree of ingenuity and skill to succeed in admitting the former and excluding the latter from the Roll of Honor. In the olden days when courses of education consisted largely in acts of memorizing, it was not at all impossible for the student who was not really deserving to succeed in being placed upon the Roll of Honor, and indeed it was not impossible for a student who had been delinquent and careless throughout most of his course, by some brilliant act of memorizing near the close, to succeed in appearing to attain to this high standard; but times have changed, and it is not too much for us to assert that in these days and so far as applies to this institution. this is no longer possible. With rare exceptions, we may say, that the names which we place upon our Rolls of Honor, are the names only of those students who are really good. In other words, it is not possible, it has not been possible for any one of those whose names I shall read to you this evening, except by industry, faithfulness and diligence, extending throughout the whole two years of their study, to succeed in getting their names enrolled upon this list, so that in reading the names of these honored students we are able to testify not only to the amount of knowledge which they possess, but to their diligence, to their character as men and women. We might also add that there are many others who have also presented these same qualities, who have tried faithfully and long, but who have failed to reach this high standard. All honor is due them for the efforts which they have made, because we are obliged by our regulations to exclude them if they fall even one mark below the number which has been fixed upon as making up the Roll of Honor. They have then successfully endured crucial trials not only of their knowledge, but of their ability to put into safe and successful practice the knowledge which they have attained. Their examination actually began during the first week after they entered, in October, 1894, and they have been under constant surveillance ever since, so that it would have been impossible for them to have been enrolled among the honored students if they had failed at any time during this course of study. The long and tedious race of two years in the recitation room and in the laboratory culminated last week in an examination which occupied 4 days, including a knowledge of, and the ability to identify the crude substances with which the pharmacist is concerned, to estimate by chemical means their composition ; by the aid of the microscope, to determine whether or not they were adulterated ; in the pharmacy laboratory, to manipulate these crude substances, and to make from them the preparations from which the physician expects his medicines to be compounded ; to safely compound these prescriptions after reading them, which is by no means the least of the task set for the pharmacist, and to dispense in beautiful form the medicines which were to be taken by the patients. So you see that the examination has been an eminently practical one. Our method is to assign to the different questions which are propounded to these candidates, and to the work which they are required to perform, a certain number of points or marks respectively, these points or marks aggregating 600, so that if (a thing which has never yet taken place) some one of them were to succeed in reaching an ideal standard of perfection, the total number of marks which he could receive therefor would be 600. You will see when I read this Roll, how nearly some of these students have come to reaching this ideal standard. The names of those upon the onor Rol l will number 14. Although it is our rule to include only 13 in this list, we this year met the peculiar experience of finding that after we had marked off 12 names for this list, we found that the next highest number of marks had been attained by two students. There was a tie, and therefore our Honor Roll consists of 14 names. Those of you who are inclined to spend some time in psychological research may, perhaps, speculate as to whether this destruction of the number 13 is in any way symbolical of this high degree of progress which our institution has made during the past year.

Out of a total number of 600 marks, Mr. Otto Hensel has secured 569½ marks, making a percentage of the total possible amount of 95%.

Mr. James E. Burns, receives 526 marks, or an average of $87\frac{2}{3}$ per cent.

Harry B. Ferguson, 524 marks, an average of $87\frac{1}{3}$ per cent.

William T. Koster, 519 marks, or $86\frac{1}{2}$ per cent.

E. A. Christiansen, $513\frac{1}{2}$ marks, or $85\frac{1}{2}$ per cent.

Gustav Strack, 512 marks, or $85\frac{1}{3}$ per cent.

Henry A. Steinach, 507 marks, or $84\frac{1}{2}$ per cent.

William Broesler, 506 marks, or $84\frac{1}{3}$ per cent.

A. J. Koerber, 500 marks, or $83\frac{1}{3}$ per cent.

Miss Agnes P. Mahony, 494 marks, or $82\frac{1}{3}$ per cent.

Louis G. Scharnikow. 491 marks, or $81\frac{5}{6}$ per cent.

C. S. Woodhull Davis, 486 marks, or 81 per cent.

Burton L. Bennett and Henry C. Steinheuer, each received 484 marks or $80\frac{2}{3}$ per cent.

Now, honored students, and students who are self-honored, you have heard the claims which I have presented on your behalf, to our guests this evening, that in confirming this distinction upon you, the Examination Committee, testifies to your character as men and women of trust as well as to the fact that you possess professional knowledge and skill. Will you ever belie these words. Remember that while you are few in number, you belong to a great body of honor men who are annually turned out by the numerous colleges of pharmacy scattered throughout this land, and while you who stand before us this evening, are comparatively few and weak, the body to which you belong is mighty. While it is true that the honor of your profession rests upon the shoulders of everyone who receives the diploma of Graduate in Pharmacy, it rests in a peculiar way upon your shoulders. Remember that the high distinction that you have attained during your course of study, simply indicates the rich blessings which have been bestowed upon you by high power, and should represent to you the duties which we may properly expect of you in return. Perform these duties well. Remember that the profession of pharmacy is quite as much in need of moral status, moral character and reputation, as it is of professional learning and skill, and see to it that you discharge your duties with satisfaction.

PROF. CHANDLER: You will now listen to the valedictory address of Mr. David M. Wells, Ph.G., class of '95.

MR. WELLS: Most Worthy Officers and Trustees, Honored Faculty, Classmates and Juniors of the New York College of Pharmacy, and Dear Friends:

"The world moves and we move with it." Never was more truthful expression uttered than this familiar quotation. Man's history is one of progress. From the earliest times to the present era, there has been a gradual, but none the less wonderful, development of mankind. What would our Pilgrim Fathers think, could they come back to earth and behold the wonders of only three centuries? How amazed would they be, to hear the shriek of the steam-engine as it thunders by, covering in a day as many hundred miles as our forefathers traveled rods, could they behold our "Ocean Greyhounds" that touch two continents in as many days as it formerly took weeks or months: witness our fire-engines as they come clanging down the avenue; view copies of our Sunday newspapers, bringing the panorama of the whole world to our mental sight; listen to the phonograph, that wonderful fruition of Edison's fertile brain; talk with men a hundred miles away by means of the telephone; see the mysterious flash-flash of our intercontinental cablegrams; survey with wonder the magnificent electric light, turning night into day; and when they have done all this we can imagine hearing them exclain, "America! Thou hast indeed made glorious progress!"

Where a short time ago was our sewing machine—that great blessing to womankind? Our typewriter with its legibility and rapidity? Where the Linotype, the wondrous machine for type-setting? The electric car, traveling without any visible power at the rate of a mile in two minutes? Our marvelous mail system, delivering a letter for two cents in any part of the United States, and for five in almost any portion of the globe? Where were our department stores with their hundreds of employees, which deal in every conceivable article, not excepting patent medicines? Where were our electric vehicles; the bicycle, which outdistances the fleetest horse; where the wonderful instantaneous photograph as especially utilized in the Kinetoscope? Where was the "ticker" printing by electricity the news and prices of the instant? Where was our system of transit with its horse, cable, elevated and electric cars? Where our manner of conveying money and valuables by express? The pneumatic tubes in our great stores and Post Office Department? Where but half a century ago were these wonders? Echo answers "Where?"

Invention has not progressed *alone* in her rapid strides toward perfection. Literature, art, commerce and science have been her traveling companions; although their movements may not have been so familiar to the ordinary observer, they have made progress no less wonderful.

Our banks, exchanges and insurance companies are housed in "palaces of finance" that tower in majestic splendor over the housetops of our cities; their interiors being fitted with a luxuriousness that rivals in magnificence and far excels in convenience the finest palaces of old Europe.

The many societies, clubs, religious, social and labor organizations, libraries, gymnasiums, schools, academies and colleges are the results of progress and education, and to these and kindred institutions may be attributed our advancement. The old search for a machine to furnish perpetual motion, the iridescent dream of all ages, has been herein successful. "Knowledge is power;" and like the original current in the dynamo, at first small and insignificant, it at last furnishes the dread, mysterious irresistible current of electricity which lights mankind on the way to his highest progress.

Science, mathematical and astronomical, has ever striven to keep step with the march of progress and many surprising facts are being demonstrated every day. Think of it! Four hundred years ago, our ancestors thought the earth to be flat and the sun to move! Contrast this almost universal ignorance with the knowledge that produces the precision with which eclipses are foretold, and you catch a glimpse of the progress of modern astronomy.

Turning to art, how wonderful is its influence and its diffusion. Formerly the possession of limited classes, now, through our Sunday papers and its many applications in our daily life, it has been diffused among the masses Every land has its artists and art schools to foster and develop its proper appreciation.

Though we have produced no single artist equal to Raphael and Michael Angelo, still the creation of the "Dream City" at the Chicago exposition, conclusively proves that we have developed here that correctness of taste which insures the proper amplification and application of the ancient ideals to the varied purposes of modern life.

Look at the new combination of Edison's kinetoscope with the stereopticon and the phonograph, with the promise of photography in colors. Here are form, color, motion and sound brought to our very eyes and ears, reproducing scenes from the uttermost parts of the earth, with a fidelity, beauty and truth that approaches Nature herself. So man has added to his powers, the almost divine attribute of Ubiquity.

In the "Art that preserves all arts," the world of printing, what a change has taken place! Lithographs, which were considered marvels only a decade ago, have been superseded by the chromolithograph and the photographic processes of reproduction which enables our Sunday newspapers to furnish us with faithful copies of artistic masterpieces with a fidelity and beauty then not dreamed of.

Amusement has ever reflected progress in other departments. As in the rush of business all is nervous haste so we hasten away to pleasure. How realistic are our modern theatrical plays! Wonderfully do actors, scenery and music blend in one harmonious whole in Wagner's Operas.

Architecture and engineering have made such rapid strides that the law has interposed to restrict man's genius and enterprise and to prevent the erection of such enormous towering edifices. Where but one century ago could be shown such a structure as the Brooklyn Bridge, carrying its hundreds of thousands daily!

But, ladies and gentlemen, among all these manifestations of progress, none stands out more prominently than the advance in Medicine, Surgery and Pharmacy. Our State Boards of Pharmacy are making their examinations so strigent that only a good college graduate in pharmacy will be capable of passing them. A good pharmacist must be a good chemist, a good botanist, a good physiologist and a good business man. So this increase in requirements is right and just, for it will elevate pharmacy.

Comparing pharmacy and surgery, one might say that surgery has made more progress, but is this so? No, ladies and gentlemen, decidedly not. All honor to pharmacy, for it was she who discovered anæsthetics to deaden the pain, and she furnishes the antiseptics that enable surgery to perform her miracles and achieve such curative wonders.

As the class of '95 is happily gathered here to-night, we mark an epoch in our lives; a goal reached; the closing to many of our student life—the opening of our future.

When we entered our old college building on Twenty-third street two years ago, many of us were mere boys; but we go forth from our grand, new and peerless college as *men*, having had our eyes opened to our responsibilities, confident of our preparation and anticipating success. We who are victorious, have reaped the reward of pluckly perseverance in study and disagreeable apprenticeship, to go forth into the world as full-fledged pharmacists.

Our course has been thorough and has embodied the highest standard of practical knowledge. Theory was taught but only as it helped us to master our everyday work.

Commencement night has ever been a stimulus to our tired bodies and weary minds, as we have poured over the mysteries of chemistry, curiosities of botany and pharmacognosy, intricacies of physiology, wonders of physics, and the myrial details of pharmaceutical manipulation. When we, perchance, thought of a day's outing, the idea of failure in examination and forfeiture of the right to enjoy this happy occasion, held us close to our books and our duty.

Brothers of the class of '95, we have had many happy hours which are indelibly engraven on our memories. We soon scatter to our homes, to the four quarters of the globe; we shall carry with us bright memories of the happy scenes, to be recalled in years to come, when we shall ponder and wonder how our individual friends are progressing. One, we shall remember as so bright and witty; another as always so sleepy; a third as a leader of song; a fourth as a linguist; in short, each will be remembered by his personality.

This occasion is one of mingled sorrow and joy. Sorrow because good, true friends must part, and pleasant comradeship must end. Faces must pass from our view, never perhaps to be seen again; regret that we must leave our alma mater, our dear mother in pharmacy, under whose roof we have spent so many instructive yet happy hours; sadness because we must part from our preceptors and many acquaintances made while sojourning here. But this commencement is also a scene of *joy*. Joy because our college studies are over, and our anxieties gone; happiness, because we are now authorized pharmacists, and look with pleasure to the fact that we may commence business upon our own responsibility; rejoicing that we shall have the full confidence of our employers, as they readily recognize that a graduate of the New York College of Pharmacy is thoroughly fitted for any pharmaceutical work.

We members of the class of '95, are about to go on life's stage of *action*. Thus far we have made good progress and are well prepared ; but this preparation is only the beginning of real life. We meet now the great question : After College, what ?

Now all depends upon the individual. Some of us begin our voyage on life's sea amid auspicious surroundings and with colors flying proudly. Shall we be wrecked upon the rocks of business adversity ? Some of us sail forth grandly, slowly, carefully, thoroughly, honoring our profession and calling, and fervently, heartily do I wish that all may anchor safely in the harbor of prosperity.

Friends of '96, Worthy Officers and Trustees, Honored Faculty and Fellow-Classmates : The hour of parting has come ; the time draws near when we clasp hands and say good-bye ! God be with you ! We part with sincere sorrow and a keen sense of loneliness ; but would we not be more lonely with no friends to leave behind us ?

To you, Honored Officers, Trustees and Faculty, we give due honor and praise for your generous painstaking efforts in preparing our new college home, and it is with pride that we go forth as its first class of graduates.

Dr. Chandler—The class of '95 extends to you a simple, earnest, sad farewell.

Prof. Rusby—We would not leave you, but it has been willed otherwise. You have ever been to us a good, kind, true and faithful friend.

Prof. Elliott—You have always earned and always will retain a warm place in our hearts.

Dr. Coblentz—Though absent in person we feel you present in thought. We recognize in you a master in Pharmacy, and none better than we, knows how thoroughly and deservedly you are appreciated.

Dr. Jelliffe—You have not been with us so long but you will hereafter, as in the past, enjoy the kindliest thoughts of your class.

Prof. Oehler—You had the happy faculty of making things so easy to us, that it is impossible to forget your pleasing voice and kindly manner.

Prof. Madison—To you we will always look with pleasure. You have given us so much valuable help, and have ever shown so accommodating a spirit, that will linger long in the hearts of your boys.

Prof. Ferguson—Though last in our list, by no means the least. Your class extends to you its hearty thanks, in poor payment for your painstaking efforts to lighten our tasks in the many difficult problems of chemistry.

Classmates—To you I turn with sorrow, for among you have I found many acquaintances and sincere friends. To you I likewise bid adieu, hoping that in the future our paths shall happily intertwine as in the past.

Dear friends all, in the name of the class of '95, I bid you farewell.

PROF. CHANDLER : The Trustees of the College have offered three prizes of $100 each—one for the best examination in practical chemistry; one for the best examination in practical pharmacy, and one for the best examination in materia medica and pharmacognosy. The prizes are competed for at a special examination held for this purpose, and they are open to the members of the Roll of Honor, and in addition to these, to such students as have shown marked proficiency during the session. These examinations have been held, and the names of the successful competitors have been placed in my hands. The prize in materia medica and pharmacognosy has been awarded to Miss Agnes P. Mahony of New York. The prize in pharmacy has been awarded to Otto Hensel of New York. The prize in chemistry has been awarded to C. S. Woodhull Davis of Port Jefferson, N. Y. I would say that in the case of Mr. Davis, although the examination extended over four hours, and was a practical examination involving a great variety of tests, everything that Mr. Davis did was correct and he obtained a mark of 100 per cent.

PROF. CHANDLER : The Alumni of the College of Pharmacy offers three prizes ; the first, a gold medal, for the best general examination; the second, a silver medal, for the second best general examination, and the third, a bronze medal, for the third best. The prizes will now be awarded by Mr. Herman Graeser, Ph. G., President of the Alumni Association.

MR. GRAESER : Ladies and Gentlemen : As Dr. Chandler has told you, the Alumni Association offers three medals, a gold, silver and bronze. These medals are for general excelence not only in the theoretical examination, but also in the practical examination. The gold medal goes to Mr. Otto Hensel who has received 95 per cent. of the total number of marks. The silver medal goes to Mr. James E. Burns, who received 87⅔ per cent. The bronze medal goes to Harry B. Ferguson. Mr. Ferguson is only ⅓ of 1 per cent. behind Mr. Burns.

Gentlemen: You are the flower of your class. I trust when you go out to practice your vocation, you will aim at the same high standard that you have achieved in your College. By keeping your standard up, you will cast a halo of glory around yourselves, your profession and your Alma Mater.

Alumni Notes.

MINUTES of the annual meeting of the Alumni Association, held in the college lecture room, May 8, '95.

The meeting was called to order by President Graeser, at 5 o'clock P. M. In the absence of Secretary Hoburg, ex-Secretary Harry Heller was appointed pro tem.

The following members were present:—M. A. Auerbach, '94; T. B. Breen, '91, Geo. F. Burger, '94; L. W. Geisler, Jr., '94; H. Graeser, '89; A. E. Hegeman, '92; H. Heller, '93, A. Henning, '76; H. A. Harrold, '94; F. Hohenthal, '81; H. W. Ihmels, '93; H. Krueder, '94; D. T. Larimore, '85; K. C. Mahegin, '89, Ewen McIntyre, '47; F. W. Richtmeyer, '90; B. J. Schrimer, '93; A. C. Searles, '86; A. Stover, '83; C. Stoerzer, Jr., '94. C. T. Wolff, '94.

The reading of the minutes of the Executive Board meetings for the past year was dispensed with on motion of Mr. Larimore.

The president then delivered his annual address which was as follows:

To the Alumni Association of the College of Pharmacy of the City of New York:

Ladies and Gentlemen—The constitution rightly imposes on its president the task of preparing an annual message and submitting it at this meeting. To-day I wish briefly to review the work done during the past year, and to make a few recommendations for the future. There were held last year four Executive Board meetings, at which all the business of the Association was transacted, and five regular meetings at which 22 new members were elected, and five lectures were given. It is needless to mention that the course of lectures was a complete success.

A summer outing was also held in June, at Peteler's, at New Dorp, Staten Island, which was quite a success, and, although well attended in comparison with the attendance of former years, I would suggest that more of our members make use of this occasion to become better acquainted with one another.

THE ALUMNI JOURNAL has, thanks to its efficient management and able editing, been a potent factor for the welfare of our Association, and the advancement of the interests of the college. Each number contained original papers from prominent scientists, and its students' columns have been read with great pleasure and satisfaction by its subscribers.

It has been a success from the start, and deserves the support of every student and alumnus of the college. I wish especially to mention the importance of THE ALUMNI JOURNAL as the means of making people acquainted with our college, and in keeping up the interest of those who have graduated from here, which in most cases dies out in a few years without some continual stimulus as THE JOURNAL has proven to be. Every student who is a subscriber, becomes a centre of information on matters pertaining to the college, which can only react to the benefit of his Alma Mater.

A course of lectures to the senior class, on "First Aids to the Injured" should be instituted, for which purpose the class should be divided into small sections, the hours of instruction so arranged as not to interfere with the regular curriculum.

Last year I suggested that the Association be reorganized by assembly districts, each district having one representative. Some work has been done in this matter, but it is far from being completed. I therefore suggest that a committee be appointed to effect such organization. I have very often been approached by members of the Association and also students of the college, asking why we never got up some social affair in winter. I would suggest that in addition to the summer outing we have a dance next winter which will undoubtedly be a success.

Very respectfully,
HERMAN GRAESER, President.

The treasurer, Mr. Henning, then read his report, which had been audited and found correct, and upon motion of Mr. Herold was accepted.

As business manager of THE ALUMNI JOURNAL Mr. Henning reported as follows:

Since my last annual report THE ALUMNI JOURNAL has steadily gained in favor among its readers as well as advertisers. The subscription list has more than doubled during the year, and the greater number of advertisers have cheerfully renewed their contracts. For obvious reasons bills have not yet been sent out to old subscribers whose subscriptions expired during the past three months; but I can safely estimate that the assets of THE ALUMNI JOURNAL will be increased very materially. Still while the above shows a decided improvement, I would like to impress on all members that we require the assistance of every one; not only should every member subscribe without delay, but they should try to secure subscriptions from pharmacists who are not members of the Alumni Association.

It would be an erroneous idea to think that the JOURNAL can run itself without the co-operation of its members. Therefore permit me once more to urge all those who have not yet subscribed to do so to-day, or before the end of the month.

Mr. Hohenthal then reported as follows for the committee to audit the accounts of the treasurer:

After carefully examining the accounts, books and vouchers of Adolph Henning, treasurer of the Alumni Association and of THE ALUMNI JOURNAL, we find his accounts correct and kept in good order. Very respectfully,

FRED. HOHENTHAL,
DUDLEY T. LARIMORE.

On motion of Mr. Ihmels the report of the auditors was accepted and the committee discharged with thanks.

The appointment of members to serve on the Committee on Summer Outing and the Committee on Finance was deferred by the president, as was the report of the Alumni Day Committee.

On motion the report of the Committee on Medals was accepted and the Committee discharged with the thanks of the Association.

Mr. Hohenthal reported as follows for the Examination Committee for Junior Prizes:

To the Alumni Association of the College of Pharmacy of the City of New York:

After carefully examining and rating the examination papers of the Junior Class for this year we find the following Roll of Honor giving the percentage or number of points out of 700 possible:

1. Merton J. Coats, 90% or 630 points.
2. Alois Hostomsky, 88.29% or 618 points.
3. Thomas LeClur, 87.43% or 612 points.

4. John H. Eberhardt, Jr., 85.86% or 601 points.
5. Alb. Deutschberger, 85 29% or 597 points.
6. Karl M. Vogel, 85.29% or 597 points.
7. Howard H. Hagen, 82.14% or 575 points.
8. Philip Eckhardt, 81.71% or 572 points.
9. Louis Protzmann, 81.57% or 571 points.
10. Joseph M. Kraft, 81.43% or 570 points.
11. John J. McLaughlin, 81.14% or 568 points.
12. Wm. J. Sheirs, 78.43% or 549 points.
13. Adam J. Franz, 75.71% or 530 points.

Respectfully submitted,

FRED. HOHENTHAL, Chairman,
GEO. C. DIEKMAN,
HENRY KREUDER,
DUDLEY T. LARIMORE,
WINFIELD JOHNSON,
Examination Committee.

Registrar N. D. Phillips being out of the city his report was deferred.

The next thing in order being the election of officers, the president appointed Messrs. Kreuder and Auerbach to act as tellers.

Upon motion of Mr. Larimore the election of third vice president was deferred until after the election of new members.

The result of the election is as follows :

President, Alfred Stover, '83.

First Vice - President, Arthur C. Searles, '86.

Second Vice-President, Dudley T. Larimore, '85.

Third Vice-President, Otto Hensel, '95.

Treasurer, Adolph Henning, '76.

Secretary, Wm. A. Hoburg, Jr., '93.

Registrar, K. C. Mahegin, '89.

Executive Board, three years, T. B. Breen, H. A. Herold.

Executive Board, two years, Winfield Johnson, Nelson S. Kirk.

Executive Board, one year, Henry Kreuder.

(Old incumbent for one year, Fred. Hohenthal.)

The following appointments were deferred by the retiring president, until after consultation with the president elect:

Delegates to the meeting of the American Pharmaceutical Association to take place at Denver, Col., August 14, 1895.

Committee on Publication, and Papers and Queries.

There were elected to membership Messrs. George Merker, '93 ; Otto Hensel, '95 ; H. G. Steinheuer, '95.

The president appointed Mr. A. C. Searles to serve as a committee of one to write up a report of the Alumni Day Entertainment for publication.

There being no further business the meeting adjourned on motion of Mr. Burger.

HARRY HELLER,
Secretary pro tem.

'93 NOTES.

ANOTHER year past! Another Alumni Day gone--another Commencement—another year added to our existence as Ph. G. Some of us have grown richer, some—poorer, and, probably, all wiser in worldly and pharmaceutical things.

Two years back we sat on the stage viewing the world from our seats, while plans were formulated in our brains, how to conquer a place —a high place—for ourselves and benefit mankind at the same time ; and we seemed eager to have a try at it.

Two years past and I can say without fear of contradiction, that none of us has reached the top of the ladder yet (is there an end to the ladder of fame?), while some have secured enviable position, some good position ; some hustling for themselves, all will admit that the world and success, viewed from the stage at our commencement, differs materially from the world and success we rub against off the stage in real life.

THE fact that but few '93 faces were noticed that night, I feel, is due to the fact that THE ALUMNI JOURNAL, in which I made my touching appeal to the boys, was issued a day after the event.

The class was represented by Uhle *minus* his silk hat, Mr. Cubit plus his, Mr. Wrench with a smile, Mr. Ph. Schaaf with three young ladies, Mr. Siegel, all by his lonesome, Mr. Jacobson and young lady, Mr. Vrooman ditto, Mr. Boldrian with a "You give a cry, Fanny?" Mr. Meighan, Johanson and Mr. Hoburg.

The first cry was given by '93 and a good one it was, boys! Commencement exercises, well, just like the previous have been and future will be, more or less.

Every one of the officers of the College had his say.

One familiar face we sadly missed, that of our beloved quizz-master Dr. Harrison, and while one side of our capacious heart was filled with sorrow, another side was filled with pleasure at seeing two of our old quizz-masters, Messrs. H. Kraemer and Dr. Dykman, thus producing a cardiac equilibrium.

We found ample time to give a few '93 calls, talk of old times and take a few doses of Schmitt's Extractum Malti alcoholici, dispensed by the boss himself, guaranteed to cure the tired feeling, some of the proceedings gave the boys.

MR. W. FRANCE is with Dr. Gill in Mount Vernon, N. Y., Mr. McCarthy with Thos. Walsh, in Yonkers, N. Y., Wrench with Rupp at 9th ave. and 36th st.

MR. UHLE is a partner in the firm of Dohl & Uhle, 144th st. and Columbus ave.

WILL MUNSON is on 16th st and 6th ave.

Now a word about the Annual Outing of the Alumni Association.

The Committee of Arrangements for the Outing consists of J. Tannenbaum, Harry Heller and G. Keale. We promise to give the boys a better and more enjoyable afternoon at a smaller cost then that of previous year.

How many of '93 will be there? You and your friends are invited, and if you send me your address I shall be pleased to send an invitation to each separately.

JULIUS TANNENBAUM,
74 E. 105th st., New York City.

'94 NOTES.

ANOTHER commencement with all its splendor is over. What were our juniors are now our professional brethren occupying the same position we do. After diligent work they have obtained the long sought for goal, and are now capable of "attempting" any pharmaceutical task no matter how colossal. 'Tis said their course of instruction was a trifle longer than ours; even so they should consider themselves fortunate in having an advantage which we were only promised.

They proved themselves to be a bright class, not only in the pharmaceutical line, but in music, art and drama.

Their literary contributions were bright, original and interesting; they should be continued under the '95 caption in this journal.

WELL! WELL! It was indeed a treat to see so many familiar faces again. Commencement seems to offer the best inducements to the boys. Among the '94 boys present were, ex-President Ehrgott, ex-Secretary Linnig, Wurthman and Imhoff. Messrs. Wood, Kellar, Clarke, Struck, Anness, Wilcox, Cooke, Erb, Van Tassell, Young, Bastedo, Burger and Stürger. After the exercises, a "May Walk" under the leadership of Burger was indulged in, the ranks being swelled by Col. Wade and B. Edgar Dawson. The march was down Broadway with an occasional "Penta! Meta! Boraci!" salute to some prominent pharmacist.

When Thirty-third street was reached, a halt was called, when the walk dispersed. Some going home, while the others sought the hostelry of a caterer where a "Class Supper" was served.

EX VICE PRESIDENT WILCOX is said to have a nice position in Asbury Park. His many friends will envy him when they are are hustling in a 90° atmosphere this summer.

COL. WADE and B. Edgar Dawson are still with Fraser & Co., 262 Fifth avenue. Dawson expects to take a short trip to his home in Nova Scotia this summer.

"A WHEEL'S the thing." Such is the phrase which has recently been conspicuously displayed, and I begin to think so myself, after seeing Race, Clarke, Surrell, Ehrgott, Auerbach and Wurthmann, plod along on their respective favorites. Race has planned an extensive tour through the State this summer, with a short stop at Seneca Falls, his home. Being a scorcher, the microbes he will stir up will "never touch him."

FRED. HILTZ has returned from his Western trip, and is again located in Brooklyn, where he has a host of friends, who think Fred. is a great boy. He has joined a local dramatic association and takes an active interest in their productions, which are always favorably received by Brooklyn society.

KRUEDER and Wurthmann have for some time been busy preparing for their examinations, which resulted quite satisfactorily to both parties. The ex-Secretary will relieve the most of the summer, except the time he will devote to his vacation.

NELSON S. KIRK, PH. G.
9 E. 59th St.

THIACETIC ACID AS A SUBSTITUTE FOR HYDROGEN SULPHIDE IN QUALITATIVE ANALYSIS.

Many have been the attempts to eliminate from analytical analysis the exceedingly annoying reagent hydrogen sulphide, but without success. Now, however, this difficulty appears to have been overcome by Robert Schiff and N. Tarugie who not long ago reported (Berichte d. Deut., Chem. Ges.) that thiacetic acid, in form of ammonium salt, not only forms a complete substitute, but that its employment serves to simplify even the course of qualitative analysis. The new method has been successfully introduced by them in the university laboratory, fully displacing the hydrogen sulphide apparatus. The rapidity and completeness of metallic precipitation is claimed to be astounding, while in the hands of tyros even it gives good results.

The reagent, *ammonium thiacetate* [CH_3. C:O(S. NH_4)] is prepared as follows: Dissolve thiacetic acid in a slight excess of dilute ammonia, and then dilute to three times the volume of the acid employed. The solution has a faint odor of ammonium sulphide. Not more than about ten days' supply should be prepared, since the solution gradually becomes turbid. *Thiacetic acid* may easily be prepared by the action of glacial acetic acid on phosphorus pentasulphide; but it may be expected to be soon placed on the market by the manufacturers. Thiacetic acid is but slightly soluble in water and has a disagreeable odor.

The directions for use are to add to the cold solution of 0 5 to 1.0 gm. of the metals, the latter in the form of chlorides, from 1 5 to 2.0 cubic-centimeters of the test solution and then to heat to nearly (not quite) the boiling point. When perfectly cooled the precipitate is separated by filtration and the filtrate tested with a few additional drops of the reagent. During the reaction a very faint odor of hydrogen sulphide is noticeable.

In this manner all the metals of group II may be completely precipitated as sulphides, not a trace of metals remaining in solution, even when the difficultly separable arsenates were at first present.

Hot hydrochloric acid liberates from ammonium thiacetate intensively active nascent hydrogen sulphide, without, however, causing a precipation of sulphur. No objectionable chemicals are introduced by this method into the liquid to be analyzed, the resulting ammonium chloride being rather desirable, while the little free acetic acid does no harm.

METALS IN HYDROCHLORIC ACID SOLUTION AND AMMONIUM THIACETATE.

Arsenites and Arsenates.—In cold solution whitish turbidity; in warm solution instantaneous and complete precipitatation as arsenium trisulphide.

Bismuth, Copper, Stannic and Stannous Salts.—In cold solution partial precipitation; in warm solution complete precipitation.

Lead Salts.—In cold solution a dark red precipitate (possibly a sulphoprotochloride), which on warming is completely converted into lead sulphide.

Silver Salts.—Silver chloride, dissolved in hot concentrated hydrochloric acid, is completely precipitated as silver sulphide. The chloride, bromide, and iodide of silver, when heated with the test solution, are converted into silver sulphide.

Cadmium Salts.—Cadmium sulphide being quite soluble in warm hydrochloric acid. the precipitate formed by ammonium thiacetate will disappear on heating; however, it appears again when the solution has completely cooled.

Platinum Salts.—In cold solution a red precipitate which on warming is converted into platinum sulphide.

Gold Salts act precisely as those of platinum.

Ferric Salts are instantaneously reduced to ferrous salts.

Chromic Acid Salts are immediately reduced to chrome salts.

Nickel, Cobalt, Manganese, Zinc, Aluminium, etc., Salts, as was to be expected, are not affected by the test solution. However, the sulphur compounds of nickel, cobalt, manganese, and nickel in ammonical solutions are instantly precipitated by it; but since there are no objections to ammonium sulphide solution, as well as for some other cogent reasons, the latter is retained for precipitating the metals of group IV.—*Western Druggist.*

LIST OF GRADUATES.

Aquaro, Joseph, New York, N. Y.
Bailey, Jesse I., Armington.
Bannon, Francis P., Winsted, Conn.
Belfry, Ira E., Meaford, Ont., Can.
Bennett, Burton L., Bristol, Conn.
Bjorkwall, Charles H., New York, N. Y.
Blackmore, Henry S., Mount Vernon, N. Y.
Boenke, Rudolph, New York, N. Y.
Bradner, Wm. N., New York, N. Y.
Broesler, Wm., New York, N. Y.
Brown, Daniel E., Brooklyn, N. Y.
Brown, Wm. D., New York, N. Y.
Brzezinski, Joseph, Brooklyn, N. Y.
Burns, James E., Glen Cove, N. Y.
Carter, James B , Alfred Centre, N. Y.
Chambers, Frank L., New York, N. Y.
Cherey, L. I., New York, N. Y.
Christiansen, Ernst A., New York, N. Y.
Connolly, F. E., Brooklyn, N. Y.
Cooley, Herbert E., Batavia, N. Y.
Cordner, Robert, Middletown, N. Y.
Dauscha, Bruno F. R., New York, N. Y.
Davis, C. S. Woodhull, Port Jefferson, N. Y.
Dosh, Charley E., New York, N. Y.
Durr, George J., Jr., New York, N. Y.
Eckstein, Charles F., Guttenburg, N. J.
Engle, Charles L., New York, N. Y.
Ferrer, Fermin, Granada, Nicargua.
Ferguson, Harry B., Little Falls, N. Y.
Fletcher, Fred. W., Babylon, N. Y.
Flick, Fred. L., New York, N. Y.
Foster, John B., Newark, N. J.
Gies, Rudolph, New York, N. Y.
Gieschen, Albert H., New York, N. Y.
Gifford, Byron A., Watertown, N. Y.
Green, Alonzo P., Chester, N. J.
Greenlief, Frank M., Newark, N. J.
Greer, Wm. F. Jr., Paterson, N. J.
Hall. Wm., New York, N. Y.
Harding, Eugene W., Oakland, Neb.
Hastorf, Harry, New York, N. Y.
Heffley, Charles C., Berlin, Pa.
Heffley, Thomas P., Brooklyn, N. Y.
Hensel, Otto, New York, N. Y.
Hilliard, David G.. Jersey City, N. J.
Hummel, Luther. Glasco, N. Y.
Jorgensen, George H., New York, N. Y.
Kellogg, Alexander A , New York, N. Y.
Kellogg, J. Hollis, Bullion, Nev.
Kerr, Wm. M., Brooklyn, N. Y.
Killbourn, Harry M., Newburyport, Mass.
Kirchein, Charles H., New York, N. Y.
Klipp, John F., Greenport, N. Y.
Knight, Wm. L., Newburgh, N. Y.
Koehler, Albert, New York, N. Y.
Koerber, Adolph J., College Point, N. Y.
Koster, Wm. T., New York, N. Y.
Lavalaye, Joseph P., New Haven, Conn.
Lurch, Albert D., New York, N. Y.
Mahony, Agnes P., New York. N. Y.
Manville, George E., Whitehall, N. Y.
Meighan, James P., New York, N. Y.
Merritt, Theodore A., Newburgh, N. Y.
Meyer, Ernst, New York, N. Y.
Morse, Frank S., Watertown, N. Y.
Mueller, August, New York, N. Y.
Murray, Edward, New York, N. Y.
Murray, John J., Phillipsburgh, N. J.
Niederer, Christopher, Carlstadt, N. J.
Oats, Geo. A., New York, N. Y.
Ogden, Frank T., Middletown, N. Y.
Ohlandt, Wm. H., Jersey City Heights, N. J.
Owens, Wm. H., Middle Granville, N. Y.
Parker, John H., Newark, N. J.
Prote, Joseph C., Astoria, N. Y.
Raymond, Floyd C., Walton, N. Y.
Reed, R. R., Margaretville, N. Y.
Richter, Alexander A., Fort Lee, N. J.
Roberts, Everett H., Silver Lane, Conn.
Roeber, Charles H., Brooklyn, N. Y.
Rohne, Gustav, New York, N. Y.
Ryan, James B , Brooklyn, N. Y.
Sawyer, Edward A., Whitehall, N. Y.
Scharnikow, Louis G., Margaretville, N. Y.
Schmelz, Herman, New York, N. Y.
Schwallie, Charles E., Ripley, O.
Sherman, Fred. B., Savannah, N. Y.
Soto, Pedro de, New York, N. Y.
Steinach, Henry A., New York, N. Y.
Steinheuer, Henry C., New York, N. Y.
Strack, Gustav, Brooklyn, N. Y.
Sur, Joseph C., New York, N. Y.
Sutorius, G. Ford, New York, N. Y.
Trau. Frederick, New York, N. Y.
Vanderbeek, S. I., Jr., Paterson, N. J.
Volkmar, Henry W., N. Y.
Walter, Herman, New York, N. Y.
Weed, Edward P., Norwalk, Conn.
Wells, David M., Milford, Pa.
Wells, H. Radcliffe, Passaic, N. J.
White, Warren B., Newport, R. I.
Woell, John, New York, N. Y.
Wrensch, Alexander E., Montclair, N. J.
Young, John L., Brooklyn, N. Y.
Zeh, Frank B., Berne, N. Y.

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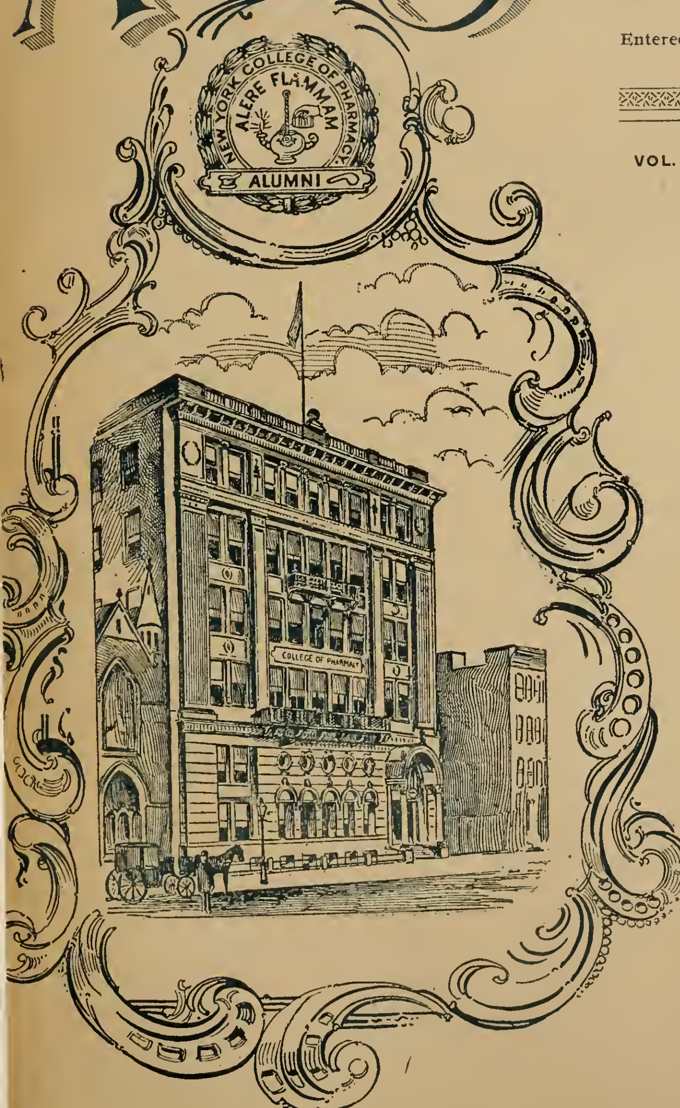

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PUBLISHED BY
THE ALUMNI ASSOCIATION OF THE COLLEGE OF PHARMACY
. . . . OF THE CITY OF NEW YORK . . . .

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THE PHARMACOLOGY OF SAW-PALMETTO.*

Botany and Materia Medica, By H. H. Rusby, M. D.

Histology By W. H. Bastedo, Ph.G. Pharmacy By Virgil Coblentz, Ph.

BOTANY AND MATERIA MEDICA.

Bot. name.—*Serenoa serrulata*, (Michx.) Hook. f.

Syn. — *Chamærops serrulata*, Michx. Flor. Bor. Am. i, 206 (1803).—*Sabal serrulatum*, Nutt; R. & S. Syst. Veg. vii, 1486 (1830).—*Brahea serrulata*, H. Wendl, in Kerch, Palm. 235 (1854?).—*Serenoa serrulata*, Hook. f. in B. & H. Gen. Plant, iii, 926 (spelled "Serenæa," but corrected on p. 1228) 1883.

Generic characters pointed out by Sereno Watson, to whom the genus was dedicated.

The high importance of the Palms from an economic point of view, as regards their decorative value and the products which they yield to commerce, and more especially the very large place which they fill in supplying the necessities of the inhabitants of the countries where they grow, scarcely equaled elsewhere in the vegetable kingdom, is in itself sufficient to lend great interest to all facts bearing on their medicinal value or uses. Such known uses however are very few in view of the great size, wide distribution and well known character of the family. Its members are extensive yielders of fixed oils and of starches, the latter variously known under the name of Sago, and abound also in sugary fruits, of which the date is the best representative; but their well known medicinal members are few, being limited to the Calamus Draco, yielding the ordinary commercial dragon's blood, the Areca Catechu, containing four alkaloids and known to us as a mild astringent and taenicide, besides being enormously consumed at home as a masticatory, and the common cocoanut, whose oil is an efficient taenicide, so sparingly used, probably only because of its great simplicity as a remedy.

BOTANICAL POSITION.

A consideration of the probable merits of the Saw-Palmetto can properly be introduced by inquiring as to its botanical relationship to these medicinal mem-

* Read before the Newark meeting of the N. J. State Pharmaceutical Association, May 23, 1895.

bers of the order, for your speaker is fairly committed to the view that there is a general, though not infallible, conformity between botanical and medicinal relationships.

Our plant belongs to the Coryphæ, which is Bentham's third tribe of the Palmæ, characterized by flabellate leaf-vernation, usually hermaphrodite flowers, one to three distinct carpels to the non-scaly fruit, a pericarp which is not strongly fibrous and a dorsal embryo. It occurs therefore near the middle of the sequence of 132 genera, while the Areca is the very first genus, with re-duplicate leaf-vernation, imperfect flowers, a thick, dry, fibrous pericarp and a sub-basal embryo, and Cocos is almost the last genus, also with re-duplicate leaf-vernation, monoecious flowers, thick, dry, fibrous pericarp, and the embryo placed opposite to the conspicuous pores of the seed. The third member of the group, Calamus, belongs rather near to the Saw-Palmetto, so far as botanical sequence is concerned, yet, cannot be said to be closely related thereto as it has a distinctly scaly fruit, with entirely different chemical products, and grows in an entirely different quarter of the globe. The only medicinal plant which is really closely related to that under consideration is the Copernicia cerifera or Carnauba, of Paraguay, with a domestic repute as an alterative and diuretic, used much as sarsaparilla is used, but these properties are not yet verified in scientific practice. Its leaves yield an astonishing amount of wax which finds a certain degree of commercial value. The classification of Drude, in Engler and Prantl,* does not differ materially in these relations.

From this it will appear that botanical relationship furnishes us no warrant for assuming medicinal virtues in the Saw-Palmetto and we must seek for them in its individual history, composition and properties.

HABIT AND APPEARANCE.

Its most nothern locality is South Carolina, where it grows sparingly along the coast, becoming more abundant southward until, in its favorite Florida locality, from Mosquito Inlet to Jupiter's Inlet, it forms a dense mass of vegetation over a strip of ground 150 miles long by one to three miles wide, unbroken except by the intervening bodies of water with their fringe of oaks (according to account of J. B. Read), and impenetrable except by virtue of the cutting of roads. Toward the ocean this belt is directly limited by the action of the waves, and upon this border it exhibits its densest growth. Inland its border fades out gradually, the plant giving place to other vegetation with which it is intermingled in variable proportions. From here it extends in a more or less broken belt around the Gulf coast, through Georgia and Florida, and it is said even into Texas. The limitations of the fruiting area are very peculiar and interesting and are not yet explained. Although flowering and fruiting are of course known to occur over the most, if not the whole of the area, this—especially the fruiting—is exceptional outside of certain portions of the belt. Thus Mr. E. W. Amsden, of Ormund, reports that in that neighborhood and for many miles distant therefrom, the growing belt is a thousand feet in width, while the fruiting belt is confined to a strip of two hundred feet, occupying the hollow or furrow between the two sand ridges toward the ocean. He estimates that the fruiting plants represent less than one per cent. of the whole. Mr. Amsden's description of the appearance and habits of the plant is the best that I have seen and I copy it entire from the manuscript with which he has furnished me.

"The trunk is horizontal and subterranean, at a depth of from two to four feet, two to thirteen feet long, six to eight inches in diameter, possessing ascending or erect branches and fed by roots about one-half inch in diameter and penetrating four to ten feet. The plants are thought to reach an age of centuries when undisturbed. Exceptionally, in very rich soil, the trunk will rise vertically even to six or eight feet. The petioles are densely spiny-serrated, whence its name, though in dense shade these serratures are wanting. In such situations it rarely flowers and never fruits. The effect of these interlacing, strong, serrated leaf-stalks upon travel and upon the labor of road-making by new settlers can be imagined. In hummocks the foliage is of a deep green, while in open level woodlands it exibits a yellowish shade, and on the coast-fringe it is of a distinctly bluish green, thus leading to the idea among some observers that there are distinct species." It is generally regarded as fruiting in alternate years, though Mr. Amsden thinks that this depends rather upon rainy and other characteristics of the season. Probably both views are correct. Abundant rain from May to October usually insures a good crop. Depending upon location, the time of blooming varies from April to June. Four months later the fruit turns from pea green to a lemon-yellow color and in four to six weeks more, it has become black and glaucous, when it is deemed ripe. The branching spadices, of which there are several, form large pendulous panicles in fruit, 18 to 24 inches long and weighing 6 to 8 pounds. Four panicles, yielding 40 pounds of fruit, have been collected from one plant at Ormund. Collection of fruit is often begun before maturity in August and it extends into January, or even in rare favorable seasons into March. The fruit stem is clipped with pruning shears and the fruit is shaken into a basket. A bushel of fruit weighs 54 pounds when fresh, and 30 to 42 pounds when dried, according to the extent to which the drying is carried. Sun-drying, on crates, requires two to three weeks for fresh fruit, while that which has become weather-cured dries more quickly.

It is estimated that the annual shipments to New York, Philadelphia and Baltimore reach 150 tons, the largest amount from any one place, namely 30 tons, being shipped from Ormund. The finest fruit is said to be taken, and the best prices paid, by New York customers, Philadelphia standing next, while the driest and cheapest fruit is shipped to Baltimore.

From the foregoing it will be seen that the Saw-Palmetto constitutes a very extensive natural product, easily collected and prepared, and it becomes an important duty of patriotism, in the interest of political economy, to find some valuable uses to which it can be put. Our information as to such possible uses may be summarized as follows :

ECONOMIC USES.

The "root," in which term as here quoted is included the underground trunk, is rich in tannin and is said to have been successfully experimented with as a tanning agent. The trunk is also said to be a remarkable yielder of potash. The leaf and petioles are utilized in the production of both fiber and paper pulp. The flowers serve as one of the most important foods of honey-bees and the superior honey thus produced is known in the market by the distinctive title of "Palmetto Honey." The seed is extremely hard and is used as a substitute for vegetable ivory in the manufacture of beads and similar objects. The pulp of the fruit forms one of the most important foods of the wild animals of the region where it is found. All accounts agree that the fattening power of this pulp upon both wild and domestic animals is phenomenal. Apparently there is no record of any other vegetable substance whose power in this direction equals that of the one here considered. Although not collected for feeding to domestic animals, yet it is deemed one of the most important sources of food supply for running fowls and pigs. Some farmers even regard the extreme and rapid fattening which results from its consumption as not being compatible with conditions of health and restrict the access of their animals to the supply. No record has been encountered of this fruit being, or having been, extensively or habitually eaten by man, though it is known that it has been eaten to some extent both by the aborigines and the settlers. Its taste is characteristic, described by Dr. Read as at first exceedingly sweet, followed in a few seconds by an acrid and pungent sensation spreading to the fauces, nasal mucous membrane and larynx, and later by a feeling of smoothness in all parts as though they had been coated with oil. Some other descriptions of this so-called "smothness" read as though it might proceed from a slight local anæsthesia.

MEDICINAL USES.

In standard literature we find very little reference to the medicinal properties of this fruit. We do not find it mentioned in any work on medical botany. The last edition of the National Dispensatory does not contain it and the United States Dispensatory gives it a notice of only six lines in extent. The best resumé of it will be found in "The Pharmacology of the Newer Materia Medica,"* where it is credited with being sedative, pseudo-narcotic and diuretic, and said to improve digestion, increasing the flesh and strength, remedial of neuralgic disorders and allaying irritation of the mucous membrane of the throat, nose and larynx, used with decided success in phthisispulmonalis, bronchitis, acute and chronic laryngitis, etc. Other uses are mentioned in the clinical reports which this book quotes, but these are not accepted or endorsed in the editoral summary. Apparently the first real introduction of the drug to medical literature was by Dr. J. B. Read of Savannah, who reported upon its successful use as a nutrient and catarrhal remedy. Dr. J. U. Goss in 1879 confirmed the reports of its value in catarrhal troubles, and added that it was specially valuable in chronic bronchitis. Dr. Stephen F. Dupon, of Savannah, declared that no remedy had proven so beneficial in pulmonary complaints. Reports of its value in connection with diseases of the genital organs appear to have originated with one who was not a physician, Mr. J. M. Dixon, Ph. G. of California. Several medical men followed with confirmations, but we cannot claim to have any important or weighty testimony in this direction, while it may be stated that the nature and language of the claims constitute in themselves a good ground for suspicion. Still it must be noted as upon printed record that the remedy is a sexual tonic and a reducer of prostatic enlargement, and that these claims are built and enlarged upon by various pharmaceutical houses, ethical and non-ethical, almost *ad nauseam*.

A review of the above literature was presented at the last meeting of the American Pharmaceutical Association at Asheville by Mr. C. C. Sherrard, Ph. C., who accompanied the same by an account of a partial proximate analysis by himself. The apologies of Prof. Coblentz and myself are perhaps due to Mr. Sherrard for interfering in a work which he probably still has in hand, but in justice

*Published by Parke, Davis & Co.

to ourselves, as relieving us from any appearance of deliberate interference, we may state that we had already committed ourselves to present this contribution before we had taken note of his work in that connection.

Endeavoring now to ascertain what is the present status of the opinions previously advanced as the medicinal properties of this drug, I would conclude as follows:

1. We have no records of any scientific investigation of such properties, and must rely for the present entirely upon empiricism which, while certainly conclusive as to certain facts, does not explain them.

2. Even empirical results cannot be said up to the present to have confirmed the claims as to the control of this drug over the sexual organs.

3. Phenomenal powers as a nutrient are fully established.

4. Its great value in catarrhal disorders is well established by the evidence before us.

5. Perhaps this value in catarrh is sufficiently explained by the effects of the drug in nourishing the mucous membrane. If this is true, then the remedy may be placed naturally in the same class with cod liver oil, and it is even worth while to ascertain whether it be not equal or superior to that remedy.

6. In such case it is clear that certain preparations will be found to embody the virtues of the fruit, while others will probably be partially or even completely lacking therein. Hence it is very desirable that the physiological department of pharmacology should take up the investigation at this point.

From Prof. Coblentz's report given below of the composition of this fruit, it will be seen that there is contained a remarkable amount of carbonaceous nutriment to account for its great fattening powers. But it must not be forgotten that the mere presence of such material does not necessarily imply fattening powers, as in that case all such substances would act similarly when proportional amounts were consumed. It would appear that there is something in the nature of the nutrients of the Saw-Palmetto, or in the associated substances, which favors nutrition. This is a point for investigation by physiologists, and until it is determined the best form of preparation cannot be indicated with certainty. But at least we know the latter should be made to include the glucose, fat and fixed oil.

We may now turn to pharmacognosy, chemistry and pharmacy of our subject, and ascertain what information has been placed at the disposition of the physician to serve as a basis for his investigation. In this connection we note at once that no comparative examinations have yet been made respectively of the immature fruit, the mature fruit, and the fruit which has been allowed to become partially weather-beaten upon the plants. Inasmuch as there are placed upon the market fluid extracts of both the unripe and ripe fruit, it would appear eminently proper that some investigation of the relative composition of these two forms should be undertaken.

DESCRIPTION OF FRUIT.

The gross appearance and structure of the fruit, as it appears in the market, are as follows: Of oblong-ovoid form, from one-half to one inch in length and about half as broad, the coast form being nearly twice as large as that of the interior. The wrinkling in drying is not excessive. The wrinkles are rather few and not very elevated and sharp, separating rather large, smooth, flattened areas. If sun-dried, the wrinkling is more abundant and stronger. Except for the wrinkles the surface is smooth, very slightly glaucous and of a black color with a brownish shade.

Structurally the fruit is one-seeded drupe. The pericarp possesses a well distinguished epicarp, sarcocarp and putamen. The epicarp is rather thick and tough, a little more so than that of the date, and is strongly cutinized. The sarcocarp is slightly fibrous or stringy. On being stripped off, a thin sub-layer of it is left clinging to the putamen. The putamen is crustaceous, thin, smooth and free from the contained seed. The latter is somewhat smaller as compared with the fruit than is the case with the olive, for example, and is oblong-elliptical in longitudinal section, nearly circular in transverse as to general outline, the ventral surface a little flattened and bearing a distinct raphe running the entire length. The hilum is small, sub circular and basal. The embryo is very small and upon the dorsum near its base, in which particular it differs from the date seed, which bears the embryo near the center of the dorsum. In consistence it is subosseous and it is solid.

The histology of the fruit has been worked out by Mr. W. A. Bastedo, a graduate of the class of '94, of the New York College of Pharmacy.

HISTOLOGY.

A traverse section or the fruit presents the following from the periphery inwards:

Epicarp—Uniformly about .625 mm. deep; obviously distinct from the mesocarp.

Mesocarp—Composed of two layers:

(1) An outer light yellow pulpy layer, its thicknesses depending on the wrinkling of the epicarp in drying; average thickness is 1.2 mm. (2) An inner dark brown layer, uniformly about .5 mm. thick. Numerous fibro-vascular bundles are scattered about.

Endocarp—A single uniform stony layer, about one-half the thickness of the epicarp. The seed does not quite fill the cavity, the intervening space being filled with a sticky, viscous liquid.

The Seed—Presents a testa .125 mm. thick, a tegmen .01 mm. thick, and the albumen, which measures laterally 8 mm. and dorso ventrally 6 5 mm.

The Embryo—Is close to the tegmen extending towards the centre of the seed, in shape cylindrical, flattened at inner end, about 2.5 mm. long, 1 mm. in diameter. On the side opposite the embryo is the raphe, which, with the testa and tegmen is .5 mm. thick.

The Epicarp—The external cuticular sheath is uniform .0075 mm. thick, completely cutinized so that its cells are not distinguishable. Beneath this is a layer of about three or four cells thick, composed of thick-walled, narrow cells, elongated tangentially about .045 mm. long, and one-third as broad, completely filled with dark-brown resinous matter. On tangential section these cells are triangular or quadrilateral, .0375 mm. in diameter, and exhibit a mucilaginous thickening of the wall. In this layer is occasionally found a group of non-pitted sclerotic cells.

The next layer has a depth of three or four cells with less thickened walls, which are lignified, scarcely pitted, and have a middle lamella readily discernible. The cavity is a little more than half the diameter, and is filled with a reddish-brown resin. Of these cells those most external have the thickest walls, and becoming thinner towards the centre, they grade into the next layer which is composed of thin-walled oval or oblong parenchymatic cells about .15 mm. long, and .08 mm. broad. These latter cells contain reddish resin, and have small vacuoles close to the cell-wall. There occur in this layer a few solitary little-pitted stone-cells filled with resin, and from these radiate the immediately adjoining parenchymatic cells. The epicarp shows a distinct line of demarcation from the mesocarp.

The Mesocarp—The parenchyma presents several different forms of cell in not clearly defined layers. The outer layer is of loose tangentially elongated cells connecting mesocarp and epicarp. The second layer is of oblong cells, irregularly strung together, containing two kinds of oil, which is either collected along the cell-wall or scattered promiscously about. One oil is of very light yellow color, forming regular globules about .0108 mm. in diameter, the other, a darker oil, is in irregularly shaped drops, measuring from .0081 mm. to .0405 mm. in diameter. Half way through the mesocarp the cells become nearly equilaterial. The inner fourth of mesocarp forms a layer of uniform thickness around the putamen. The outer portion of this consists of elongated somewhat thick-walled, very little pitted cells, crowded and irregularly compressed together. These contain oil globules. Then comes a single row of square or oblong narrow cells, polygonal or longitudinal section, containing calcium oxalate crystals. This layer is sometimes wanting. Between this and the putamen is a layer of about three cells deep of irregularly triangular empty cells attaching mesocarp to endocarp. In the last layer are no fibro-vascular bundles nor resin-cells. In the pulp are many large oval cells about .0625 mm. x .162 mm. occurring singly or in twos or threes, or five or six forming a segment of a circle. They are filled with a dark-brown resin, and to the naked eye show as brown streaks through the pulp.

The fibro-vascular bundles are of the closed collateral type, the xylem being always towards the centre of the fruit. They are numerous and irregularly scattered.

The Xylem is composed of several large vessels, partially encircled by thinner-walled wood-cells, on longitudinal section exhibiting several spiral ducts surrounded by narrow somewhat pitted ducts and outside of all, cells with cratei-form openings in the walls.

The Philoem portion consists of soft bast and sieve-tissue, no hard bast being distinguishable. In longitudinal section the cells are much elongated, with transverse septa. Each bundle is surrounded by collenchymatous cells which, becoming larger from within outward, grade into the general parenchymatous tissue. This collenchyma contains numerous globules of a light-colored oil, which on longitudinal section are seen to form a tube-like series running through the collenchyma. Diameter of a bundle = 0.5 mm, to 0.1 mm. Diameter of a duct = .0054 mm. to .0270 mm., cavity [illegible] of total diameter. Thickness of collenchyma tissue on each side of bundle, .0375 mm.

The Endocarp consists of much pitted schlerenchyma cells, which have a diameter of about .0425 mm. and are mostly isodiametric though a few are two or three times as long as broad. The cavity is about ⅓ the total diameter of the cell. The inner surface of putamen shows cells somewhat elongated and of very loose structure, linked together in many instances by large, comparatively thin-walled, little-pitted, more or less quadrangular cells. The extreme outer layer shows very small isodiametric stone-cells, making a distinct line of demarcation between endocarp and mesocarp. Between the endocarp and the seed is a small space filled with a sticky, viscous substance having a very sweet oily taste. It consists mainly of glucose, with some oil. This sticky substance has disappeared from many of the dried fruits.

The Seed.—The testa is composed of several kinds of cells: externally a single row of small quadrilateral cells with small cavities and resembling epidermal cells. Then there is a depth of from eight to ten cells, in two layers, all filled with reddish-brown resin. The outer layer is composed of from five to seven cells which have lignified and pitted, though not much thickened walls. In transverse section these are isodiametric at the raphe, but throughout the rest of the testa they are elongated around the seed. In longitudinal section the first-named are elongated and the latter isodiametric. The inner layer consists of angular cells three or four deep, non-lignified, smaller and not much elongated. Towards raphe and including it the testa becomes very thick and contains many scattered pitted sclerenchyma cells. In this portion is a long narrow opening completely surrounded by the elements of fibro-vascular bundles, there being on longitudinal section many long narrow spirals and wood cells. A transverse section near the apex of the seed shows cells much thickened, irregularly squeezed together and nearly isodiametric.

The Tegmen forms a distinct layer of about two cells wide. A cross section shows narrow and elongated thick-walled cells. In longitudinal section they appear isodiametric. All are filled with proteid matter. The albumen composes the perisperm, which is many times as large as the embryo. In a section cut transversely at embryo there is a central linear opening which extends from the tegmen about half way across the seed, on side from embryo, and from this radiate thick-walled, broadly and deeply pitted mucilaginous cells. Near the raphe these are isodiametric, but towards the dorsal side of the seed they are much elongated radially and near the tegmen become non-pitted sclerenchyma or collenchyma. All the cells of the perisperm are filled with proteid matter, exhibiting some fat and oil.

The Embryo consists of very small parenchymatic cells.

The investigation was carried on with the aid of a Zeiss microscope using three objectives and an oil immersion lens, and oculars ranging from ½ to 2 inches focus.

The following stains and reagents were used:

Coraline,	Iodine & KI,
Iodine-green,	Iodine & Sulphuric acid,
Lithium carmine,	Hydrochloric acid,
Eosin,	Hydrochloric & Phloroglucin,
Haematoxylin,	Absolute alcohol,
Fuchsin,	Potassa,
Alkanna,	Chloriodide of zinc,
	Sulphuric acid of different strengths.
	Fehling's test for sugar.

All mounts were made in water, glycerin or glycerin-jelly.

PHARMACY.

Having been requested to pass my judgment on the comparative value of samples of artificial and sun-dried Saw-Palmetto berries, I found it necessary in the course of my experiments, to make a general qualitative examination of their constituents. Since I began my experiments, Mr. C. C. Sherrard, Ph. G., has published results of his examination of the same, in the Proceedings of the Am. Phar. Assn. for 1894. Inasmuch as my views and results differ essentially from those of Mr. Sherrard, I take occasion to publish these preliminary results, which will be followed by a more thorough examination as soon as time permits. In the proximate analysis ot these berries previous drying and powdering should by all means be avoided, in order to avoid loss and alteration of sensitive principles. The berries selected had been simply air-dried and then reduced to a pulp, removing the hard seeds, which were subsequently reduced to a coarse powder.

A quantity of the crushed berries were

placed in a retort and steam was blown through until the distillate was devoid of odor and oily particles; a very small quantity of a volatile oil was obtained, which possessed a peculiar persistent odor, characteristic of the berries.

Another quantity of about five pounds of the pulp was successively exhausted with hot benzol, alcohol (90%) and acidulated water.

Benzol Extract.—The drug was exhausted with hot benzol until no further extractive was taken up, the benzol extract was then evaporated at the lowest possible temperature to extractive consistence.

A portion of this extract yielded a small quantity of volatile oil on distillation in a current of steam. Another portion was well shaken with hot acidulated water, the latter was then transferred to a separating funnel, made alkaline and shaken with ether; the etheral solution was divided into several portions on watch glasses and evaporated. The residue was dissolved in a few drops of acidulated water and tested for an alkaloid with the following results. Positive reactions were obtained with Mayer's, Dragendorff's, Scheibler's, Sonnenschein's and Bouchardat's reagents as well as with Ingol's solution and solutions of Tannic and Picric acids. Crystalline double salts were obtained with Platinic and Auric chlorides and Picric acid. Owing to the small amount of principle available, further experiments were not available; however, I feel justified in announcing the presence of an *alkaloid.*

A third portion of the benzol extract was dissolved in a small quantity of chloroform, which in turn was poured into an excess of cold alcohol. A white precipitate resulted, which was collected and purified by resolution in chloroform and precipitation in alcohol. This precipitate consisted of an *indifferent resin*, which was insoluble in alcohol, not affected by any of the inorganic acids or oxidizing agents, nor by boiling aqueous or alcoholic potassium hydrate. It melted between 96° and 98° C.

The filtrate from the above precipitate yielded upon evaporation a non-drying, saponifiable *oil* of pale-reddish color and a *fat* which separated on exposure to low temperature.

Alcoholic Extract (90%).—Considering the quantity of the drug, this was very large. It consisted of *glucose* of which a portion was insoluble in alcohol and ether and another soluble in both of these solvents. From this extract a vegetable acid was also isolated.

Acidulated Aqueous Extract.—Water slightly acidulated with hydrochloric acid yielded a large amount of solid extractive matter, which consisted of vegetable albumen, *dextrin* and *glucose.*

Thus in the pulp of berries a volatile oil, an alkaloid, an indifferent resin, a fixed oil, a fat, dextrin and glucose are present. The proportion of fixed oil, fat and glucose found in this is something remarkable.

The seed, yielded to benzol 12.12 per cent. of a pale-yellowish, bland *fixed oil* of specific gravity of 0.9103, which was insoluble in alcohol, soluble in ether and chloroform, not saponifiable by aqueous potassium hydrate, but readily so by alcoholic alkalies. It does not yield Elaidin with nitrous acid, being non-drying oil. Aside from this fixed oil some sugar and resin was likewise found to be present.

The air-dry berries yield 34.4 per cent. of dry extract with alcohol. When dried at 100° C. till of constant weight they lose 10.125 per cent. moisture. This same sample of drug yielded but 24.6 per cent. of dry extract with alcohol.

There is but little doubt but that the berries lose considerable of their fixed oil and fatty matter when dried for reduction to powder form.

PRELIMINARY EDUCATION OF PROFESSIONAL PEOPLE.

Within the last few years a movement has been afoot to better fit medical and legal students to enter their respective professions. Europe has long since been very stringent in this regard, yet it is only within a comparatively short time that any attention has been paid to it in this country. Examinations for lawyers, and medical students and pharmacists existed only in name. Gradually this has been overcome, and now a very fair knowledge is required in these branches.

Preliminary education has been started here in a fair way. It is under the supervision of the State Board of Regents and with their experience has worked very successfully. That for lawyers is rated the highest. The maximum being a prescribed 27 counts. These include :

English Composition, 2 ; advanced English, 2 ; first year Latin, 4 ; Arithmetic, 4 ; Algebra, 4 ; Geometry, 3 ; U. S. History, 2 ; English History, 2 ; Civics, 2 ; Economics, 2.

Medical students 16 counts :

Arithmetic, 4 ; Elementary English, 2 ; Geography, 2 ; Spelling, 2 ; U. S. History, 2 ; English Composition, 2 ; Physics, 2.

Pharmacists have thus far been left out.

Preliminary education has been enforced with the idea of raising the standard of knowledge and preventing incompetent persons from entering the professions. Where formerly college instruction was imparted without question as to the capacity of the student to understand it, now it is assured that such instruction shall be received properly.

I contend that we have reached a stage here where money should not be the sole aim of man. America in her young days brought about these conditions ; they are the result of enterprise and ambition ; but now, after establishing a nation, we must brighten it. Intelligence and learning are absolutely essential to success. Self-made men have had their day, unless in making themselves they start in with education.

The standard of the profession would certainly be raised if under the supervision of the Regents.

The pharmacist is really a public servant, as is a lawyer or physician. A fatal mistake on his part affects the public by loss or injury of one of its numbers.

Pharmacy is a profession, and pharmacists should associate with professional people. But can they? Their general information is deficient. People of education want to associate with people as well educated as they are. Make education a license on pharmacy and it will keep out ignorant people. It will leave the profession clean and demand its recognition. It will better enable its members to pursue advanced studies and thereby contribute to medicine. It will create a class of men whose intelligence will cast a lustre about the profession. There will be some distinction to the title "Pharmacist." Lawyers have thus protected their ranks, physicians theirs, and the pharmacist must follow.

HIERONIMUS A. HEROLD,

Rare Metals.—During his recent Royal Institution lecture on the "Rarer Metals," Professor Roberts-Austen stated that granulated aluminum has the property of withdrawing oxygen from the oxides of the rarer metals, and so reducing them to the metallic state. This is accomplished at a comparatively low temperature. By this means, he has obtained zirconium, vanadium, uranium, manganese, titanium and tungsten. The alumina formed has the further advantage of protecting the liberated metals from oxidation during fusion. It is remarkable that aluminium withdraws the oxygen from red oxide of lead with explosive force. —*Pharm. Jour.*

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THE TALENT OF SUCCESS.

There was opened, a short time ago, with appropriate ceremonies, at Owen's College, Manchester, England, a new laboratory thoroughly equipped with the most modern apparatus for the study of organic chemistry.

Dedicated to the memory of the late Prof. Schorlemmer, it stands as a fitting monument, a tribute to the man who, more than all others in England, helped to bring the study of this branch of chemistry to its present advanced condition.

Although Schorlemmer's fame rests upon the solid foundation of work well done, the naming of the laboratory in his honor, in grateful recognition of the debt which modern chemistry owes him, will have the effect of perpetuating his fame on the line of his chosen life's work.

A more graceful and fitting testimonial could not well be devised, and in honoring the memory of Schorlemmer, Owen's College has bestowed high distinction upon herself.

Schorlemmer, like every good workman, delighted in his work; earnest, enthusiastic and persevering, no sacrifice was too great, no labor too arduous; pleasure was sought and found in unraveling the threads from the wondrous web of the elements that nature in her workshop has woven through long ages. Standing at the loom and using the elements as his threads, he untangled and rearranged and wove them as he willed into other fabrics of still more varied design and marvelous composition.

If the man who makes two blades of grass grow where one grew before is a benefactor to the human race, how much more credit does he deserve, who makes one blade of grass do the work of two without the extra trouble of raising it? This is what Schorlemmer did, and his discoveries have opened new industries employing thousands of men, and representing the investment of many millions of dollars.

Schorlemmer never became rich; like Scheele, his reward, his wage came in the shape of new discoveries, in the deeper insight into the mysteries of nature. Like Scheele, too, he worked under great disadvantages, but this simply added zest to his labors, for there are no obstacles too great, no problems too deep, no riddles too difficult for men of this stamp. The love of investigation, the pleasure derived from the discovery of some hidden truth, the joy at the solving of some contested question, is only known to the votary of science. Fame to men of this calibre is simply an incident; recognition sooner or later is bound to come. Their success is real and not measured by dollars For after all, "the talent of success is doing nothing more than you can do well, and doing well whatever you do, without a thought of fame; if it comes at all it will come because it is deserved, not because it is sought after."

What encouragement lives of this kind should be to young men starting forth on their career; both are examples of true success, illustrating that though professions be overcrowded and competition fierce, true merit must win. Again, never in the history of the world was true merit so quickly recognized and so amply rewarded as in our times; nowadays the wreath of fame circles many a brow, an honor which in former times would have been reserved for a tribute upon a tombstone. A striking example of this is the world-wide fame that has come to Lord Rayleigh and Prof. Ramsay through their discovery of argon. It is but a few months ago that this important discovery was made, yet its importance has been recognized throughout the civilized world. Their fame has been heralded in every land; Columbia College has awarded them the Barnard Medal, while as a more substantial recognition their reward has also taken the shape of the Hodgson Prize of ten thousand dollars.

We note that at the last meeting of the Chemical Society in London, Prof. Coblentz was elected a member.

PHARMACEUTICAL ADVANCEMENT.

At the meeting of the New Jersey State Pharmaceutical Association, resolutions were adopted looking to the higher education of the pharmacist ; this is the only true way of elevating the standard of pharmacy. The step is in the right direction, yet we believe the movement should go still further and allow only graduates of pharmacy to practice their profession and a prerequisite of matriculation should be a high school education of a grade sufficiently advanced to admit him to a university of which Columbia may be taken as a type.

Without wishing to enter into the discussion of pharmacy as practiced to-day, we would say that as a rule a man gains as much respect as he deserves, or his life warrants. If the pharmacist of the future really desires to be a professional man he must be so, not alone in name, but his acts must prove him one and his position then will simply be a matter of course. There will be no need of the constant explanations before the public of the fact that he pursues a professional course of study at college, a garment donned at the entrance to be too often discarded at the exit, but his position will be a natural one where his standing will be unquestioned. We would say with Carlyle : "Oh thou that pinest in the imprisonment of the actual and criest bitterly to the Gods for a kingdom wherein to rule and create, know this of a certainty, the thing thou longest for is already with thee, here or nowhere couldst thou only see."

Gallicine.—This body is the methyl ether of gallic acid, of the formula $C_8H_8O_5$. A solution of gallic or tannic acid is heated in methyl alcohol with strong H_2SO_4. The gallicine is then easily crystallized out in rhombic prisms. They melt at 200°—202°C. Gallicine is very soluble in boiling water. It is used in eye diseases.—*Journal de Pharmacie d'Anvers.*

NEW LITERATURE.

Dictionaire Latin - (Grec) - Français-Anglais-Allemand-Hollandais, des Principaux Termes Employés en Botanique et en Horticulture, par A. M. C. Jongkindt Coninck, Horticulteur, à Bussum, pres d'Amsterdam (Pays Bas.) Haarlem, de Erven Loosjes.

No one actively engaged in following current botanical literature will pass the above title without attention, and nearly every one will at once desire to possess a reference book, the want of which has been a hundred times experienced ; but an inspection of the book will at once bring disappointment. Not but that the list of terms is ample and apparently well selected, and the equivalents carefully verified ; but their presence in the book is quite useless for any reference purpose because only one-fifth of them are so arranged that they can be found when wanted. The terms representing the five languages are arranged respectively in five vertical columns upon each page, but only the first column, that giving the Latin terms, is in alphabetical sequence. In order therefore to find any term appearing in any of the other four columns it is necessary that one knows its Latin equivalent, which knowledge would in nearly all cases obviate the necessity for search, except when some translation of a special and unusual character was going on. Suppose for example that one is translating from the German—and it is safe to say that such translation would represent one-half of the total usefulness of such a book—he would not know where to find the word except by knowing and turning to the Latin equivalent in the first column. But there are very few people who do not know the meanings in their own language for Latin botanical titles, while upon the other hand, it is very difficult to find botanical terms given in any dictionaries between the German and other languages. It is clear that the alphabetical arrangement could not be preserved for all the columns at the same time that their equivalents were indicated, but there are several arrangements which could be easily employed to enable us to ascertain any equivalents sought. Although any such arrangement would necessarily involve extensive reprinting, the labor and expense would be well invested in making an exceedingly useful book out of one which can otherwise have little other mission than to excite hopes which are to be disappointed.

The Seventh Lieferung of Tschirch and Oesterle's *Anatomischer Atlas* treats of Cassia and Ceylon Cinnamons, Clove-bark, Canella Alba, Taraxacum, Cardamon fruit and Nux Vomica. A separate plate is devoted to each with the exception of the second, third and fourth, a single plate sufficing for these three.

The Annual Report of the Royal Gardens of Trinidad for the Year 1894. By J. H. Hart, F. L S., C. M. P. S., F. M. S. L. Superintendent. —This document is a quarto of 23 pages, and contains a considerable amount of interesting nformation. Attention is called to the meteorological records which are regularly made, and which include not only the amount of rain-fall, temperature and similar details, but everything which can give practical information as to the general conditions affecting plant growth. The rain-fall is compiled from observations taken at 104 stations on the island.

800 specimens of plants have been collected and dispatched to Kew for identification during the year. The herbarium connected with the garden, although still far from complete, is said to give an excellent idea of the flora of the island. One of the interesting determinations of the year has been the possibility of growing the gladiolus in perfection in that climate, a fact which was not before suspected. A list is printed of 103 species of orchids which flowered in the garden during the past year. 401 visitors were registered during the year. A large number of seeds and plants have been distributed, and notable progress has been made in the introduction of useful plants to cultivation by the agriculturists upon the island. The most important advances have been made in the cultivation of the nutmeg and the castilloa.

The Bulletin, issued quarterly, has contained during the year 56 articles on practical agricultural questions, and it is said to be highly appreciated by planters.

Important progress also is reported in the cultivation of cacao, coffee, yams, gambir, vanilla, the Brazil nut and the cola.

An English patent has been taken out for obtaining both acetic and oxalic acids at one process. Wood or dried moss is first impregnated with caustic alkali and then steam mixed with air is blown over it. At low temperatures acetic acid is formed while at 300°C. or above, oxalic acid is evolved.

The quantity of each may be regulated at will, and depends on the temperature and proportion of air. The pulp remaining after the process is used in paper making.

THE MOST RECENT WORK.

Caffeine.—The recent synthesis of caffeine from dimethyl urea and malonic acid, by Fisher and Ach, has been described as being the first synthesis of this useful compound. As a matter of fact a synthesis, quite as elementary as the one recently announced, has been long known. Starting from guanine, $C_5H_5N_5O$, xanthine, $C_5H_4N_4O_2$, is prepared by the action of nitrous acid thus:

$$C_5H_5N_5O + HONO = C_5H_4N_4O_2 + N_2 + H_2O$$

Xanthine is converted into its lead compound, which is methylated in the usual way. The product is a dimethyl xanthine, or theobromine isomeric with theophylline, the intermediate body in the recently announced synthesis. The constitution of xanthine is

$$CO\begin{array}{l} \diagup NH-CH=C-NH \\ \quad\qquad\qquad\ \ | \\ \diagdown NH-----C=N \end{array}\!\!\!\!\!>CO$$

and theobromine and theophylline are two isomeric dimethyl derivatives of it. Either of them yields caffeine when further methylated, which is, of course, trimethyl xanthine of the constitution

$$CO\begin{array}{l} \diagup N-CH_3-CH=CN-CH_3 \\ \qquad\qquad\qquad\ \ / \\ \diagdown N-CH_3-----C=N \end{array}\!\!\!\!\!>CO$$

Ammonium Thio-Acetate.—A correspondent of the *Chemical News* states that on using ammonium thio-acetate in place of sulphurated hydrogen, as recommended by Schiff and Tarugi, the precipitate of cadmium sulphide obtained was reddish instead of yellow, and might easily have been mistaken for antimony. Stannic salts, again, gave brown-black stannous sulphide, instead of the usual yellow stannic sulphide. Finally, a tightly-stoppered flask containing about 100 Cc. of the reagent burst, presumably by the pressure of gas given off.

Saccharin in Beer.—It has been found by Gaulter (*Zeit für Anal. Chem.*) that the fluorescence produced by solutions of saccharin treated with sulphuric acid in the presence of resorcin is also produced by the resin of hops.

In order to detect the saccharin in beer, he proposes the following test:

The beer is first evaporated to a syrupy consistence acidulated with a few drops of hydrochloric acid, and then treated with alcohol to precipitate the dextrins. The alcoholic solution is again evaporated to a syrupy consistence and agitated with ether.

The ether is then evaporated, and the extract which consists of hop-resin and saccharin is treated with boiling water, which dissolves the saccharin, which may be detected by its sweet taste.

Fluorine and Argon.—M. Henri Moissan recently read a note at the Paris Academy of Science, says *Ch. and Dr.*, concerning the action of fluorine on argon. During his recent visit to Paris, Prof. Ramsay left a tube of 200 cc. of argon gas with M. Moissan. The latter has caused fluorine to react on argon, in a platinum apparatus closed by sheets of transparent fluorspar, which was shown to the meeting. He was able to ascertain that at the ordinary temperature no combination took place. M. Moissan also caused boron, titanium, and uranium, prepared in his electric furnace, to react on argon, but obtained no combinations, although these simple bodies unite with nitrogen with great energy. M. Moissan comes to the conclusion that of all the simple chemical bodies argon isolated by Lord Rayleigh and Prof. Ramsay is that which presents the greatest inertia. It is the opposite of fluorine, which is the most active body that exists.—*Pharm. Jour.*

Paucine is the name given to an alkaloid isolated in Merck's Laboratory from the Pauco nut, (Pentaclethra macrophylla.) It occurs in yellow scales, is soluble in hot water and alcohol, but is insoluble in ether or chloroform.

The hydrochloride gives with ferric chloride a dark-green color, while the alkaloid shaken with soda solution colors the liquid brownish-red, which gives place to a dark-red color on standing.

Glucose in Honey.—Glucose invariably contains small quantities of dextrin, whilst honey does not. If a sample of honey is suspected of adulteration with glucose, one part of the sample is mixed with two parts of water, and warmed with two per cent. of animal charcoal. Ten cubic centimetres of the colorless liqid are then poured into a test tube, and absolute alcohol poured in. If at the zone of contact a turbidity appears, dextrine, and consequently glucose, is indicated.—*Repertoire de Pharmacie.*

Hypophosphites.—The hypophosphites of bismuth and mercury have recently been carefully examined. They are both obtained by double decomposition of solution of the nitrate of the metal, and of potassium hypophosphite. The bismuth salts has the composition $Bi(H_2PO_2)_3H_2O$ and is quite stable when dry; the mercury salt is $Hg(HPO_2)$, $Hg NO_3H_2O$; it explodes when heated to 100° C.—*Apotheker-Zeitung.*

THE ASSAY OF NITROGLYCERIN.

By CHARLES RICE, Ph. D.

(From Research Committee D. of the Committee of Revision, etc., of U. S. Pharmacopœia.)

The attention of the writer has recently been drawn to the surprisingly variable effects produced by certain nitroglycerin preparations of the market. When it is remembered that probably all of the nitroglycerin used in medicine is obtained in form of so-called "10 per cent." alcoholic solution from the manufacturer's works, which the purchaser never visits, and that no reliable and simple process of assay has hitherto been available, the variation is to some extent accounted for. In the hope of finding a way out of this difficulty, the writer examined the methods heretofore proposed for the assay of nitroglycerin, and found that at least one of them, when suitably modified and properly executed, will yield trustworthy results.

When nitroglycerin is heated with alcoholic potassa or soda, it is split up into glycerin and a mixture of nitrate, nitrite and other salts of the alkali. The glycerin, according to Hay (*Journ. Chem. Soc. 48, 742*), is oxidized at the expense of the NO_3 groups, about two-thirds of which are reduced to the nitrous condition, and the final solution appears to contain no glycerin at all. Besides nitrate and nitrite, some acetate, formate and oxalate is formed, together with a small amount of ammonia, and a reddish-brown resinous substance, probably aldehyde resin, which gives a dark color to the liquid. Allen (*Commerc. Org. Analysis II., 307*) remarks to this: "Complex as the reaction is, it appears to occur in a fairly definite manner. Thus Hay found the proportion of nitrous anhydride (N_2O_3) produced by the saponification of 100 parts of nitroglycerin to range between 34.14 and 35.24, the theoretical yield corresponding to the equation given by Hay being 33.48." Allen also states that he attempted to apply Koettsdorffer's principle (saponification with alcoholic potassa) to the assay of nitroglycerin, but though the results were fairly concordant, the dark color of the liquid prevented the point of neutrality from being ascertained with accuracy by any of the indicators tried. And in a foot note he adds that aqueous potassa solution acts in a manner similar to the alcoholic alkali, but very slowly, owing to the sparing solubility of nitroglycerin in water.

Now it is this very process of saponification which the writer finds to be quite suitable for the assay. If alcoholic potassa is employed and alcoholic solution of nitroglycerin be added to it, saponification will occur at once, or, at least, very rapidly in the cold, and instantly, if the alcoholic potassa is previously heated. With an aqueous solution of potassa the saponification of nitroglycerin (which must be added in alcoholic solution) is materially slower in the cold, but nearly as rapid, as with the alcoholic, if a little heat be applied.

As far as the assay of nitroglycerin is concerned, the products of the reaction do not at present concern us, since none of them have any influence upon the titer of a volumetric alkali.

To decompose one molecule of nitroglycerin, there are required three molecules of potassium hydrate:

			(theoretically)
$C_3H_5(NO_3)_3$ +	$3KOH$ =	$C_3H_5(OH)_3$ +	$3KNO_3$
nitroglycerin	potassa	glycerin	potassium nitrate.
226.58	167.97		

Each molecule of KOH. therefore, corresponds to ⅓ molecule or 75.5267 parts of nitroglycerin.

Hence each Cc. of decinormal potassium hydrate V. S. (containing 0.05599 Gm. of KOH) corresponds to 0.0755267 Gm. of nitroglycerin.

The assay is best made with a decinormal solution of potassium hydrate in absolute alcohol, but it may also be accomplished with an aqueous one (see below). Absolute alcohol is preferable for the reason that it is always kept in glass bottles, and therefore does not contain matters producing a very dark tint with caustic alkali, and that the solution will not turn materially darker on keeping, as would be the case if ordinary alcohol had been used. The nitroglycerin should be in alcoholic solution. The assay is made in this way that a weighed quantity of the nitroglycerin solution is added to a measured volume of the decinormal potassa solution, so that the latter shall remain in excess, and that this excess is then determined by decinormal acid. The alcoholic character of the solution causes a separation of most of the salts which are formed, together with most of the brown coloring matter, and it is easy to titrate the remaining solution with phenolphtalein as indicator.

Example.—Assuming that a solution supposed to contain 10% of nitroglycerin is to be assayed. Into an Erlenmeyer flask introduce 20 Cc. of decinormal alcoholic potassa, heat it moderately, and then add to it, in several portions, 10 Gm. of the nitroglycerin solution, finally rinsing the vessel which had contained the latter with a little absolute alcohol and adding this to the mixture. Test the liquid with litmus paper to ascertain whether it is still alkaline. If it is not, this is a sign that the amount of alkali was insufficient to decompose all the nitroglycerin, and that some of the latter is still present. In this case, add another portion (10 or more Cc., carefully measured from a burette) of the volumetric alkali, and consider this in the final calculation. Place the flask on a water-bath and heat it until the contents begin to boil. Then stopper it and set it aside to cool. Now pour off the clear pale-colored solution from the colored crystalline crust adhering to the bottom of the flask, wash the latter with alcohol, add the washings to the other liquid, then a little phenolphtalein solution and determine the excess of alkali with decinormal acid. Let it be assumed that 13.5 Cc. of the decinormal alkali had been consumed in the decomposition of the nitroglycerin, the amount of the latter would be $13.5 \times 0.0755267 = 10.1961$ Gm., that is 10.196 per cent.

The method has been tried by the writer upon various preparations of nitroglycerin and has, so for, yielded reasonably uniform and satisfactory results.

In many cases, except where the color produced by the action of the alkali upon the alcohol is too dark, the ordinary aqueous volumetric alkali solution may also be used. To insure complete saponification in this case, the measured volume of the alkali should be heated to about 150° F. and, after the nitroglycerin solution is added, the whole should be heated on a water-bath for about fifteen minutes. There is no advantage in cooling it before titration, since none of the salts will separate. The liquid is simply diluted with water until its tint has become light enough to permit in it the recognition of the color of the indicator. Now add some phenolphtalein solution and then enough decinormal acid to the neutral point. As it is, however, more difficult in such a liquid to recognize the point when the tint due to the indicator disappears, than that at which it reappears, it is preferable to titrate beyond the neutral point by adding a known excess of volumetric acid, and then to titrate back with alkali until the phenolphtalein tint just appears again.

Several samples of solution of nitroglycerin recently assayed by the writer in the manner described above, yielded the following results:

	Supposed Strength.	Found to contain
No. 1	10%	14 42%
No. 2	10%	13.76%
No. 3	1%	1.76%
No. 4	1%	1.81%
No. 5	1%	1.18%
No. 6	1%	1.19%
No. 7	1%	1.39%
No. 8	1%	1.43%

Upon diluting the sample No. 1 with alcohol so that it would contain, theoretically 1 per cent., two samples of the product were assayed in the same manner and were found to contain

1. 0.992 per cent.
2. 1.013 per cent.

which figures prove the reliability of the method.

NEW YORK, May 20, 1895.

OPENING OF THE SCHORLEMMER LABORATORY.

On May 3, at the Owens College, Manchester, Dr. Ludwig Mond, formally opened the Schorlemmer Laboratory, which the Manchester *Guardian* remarks, is the result of the general feeling that the best memorial of the late Prof. Schorlemmer would be the erection of a laboratory for organic chemistry, to be called after his name. A subscription list was accordingly opened, and the appeal, which was generously headed by Dr. Mond, was so well responded to, both in England aud in Germany, that in a short time a sum of £2,500 was subscribed. In view of the steady increase in the number of students, the Council had meanwhile become convinced of the necessity of extending the chemical department. They accordingly accepted the fund raised by the Schorlemmer Memorial Committee, and instructed Mr. Alfred Waterhouse to prepare plans for a Schorlemmer Organic Laboratory, and for a new laboratory for elementary students, on a plot of land adjoining the present laboratories acquired by the College for the purpose of their extension. The Schorlemmer Laboratory is at the end of the main corridor in the old chemical building, measures 60 ft. by 30 ft., and has an arched roof 30 ft. high. It is designed to accommodate a professor, two demonstrators, and thirty-six students, and is fitted in the most complete manner, with every requisite for the important work to be carried on within it, in some particulars being arranged after the plan of the Munich laboratories. The lower laboratory is designed for forty-five students. The fittings are similar to those in the old laboratories designed by Sir Henry Roscoe. The reagent-room, 20 ft. by 20 ft., communicates by a flight of steps with Burlington street. The total cost of the new building is £4,800.

Sir H. E. Roscoe, M. P., gave a brief sketch of Schorlemmer's life, and described how he came to him as an assistant, and remained his faithful and intimate friend for thirty-four years. When Dittmar resigned, Schorlemmer was placed in the position of sole assistant and demonstrator to a somewhat increased number of students. In that new position his powers as a laboratory teacher soon made themselves manifest. and much of the subsequent success of the laboratory was due to his tact and knowledge, and to the genuine enthusiasm which he displayed in imparting that knowledge to others. He (Sir H. Roscoe), remembered as though it were only yesterday, the first beginning of the original work which had made his name eminent amongst the chemists of that time. Mr. John Barrow, of Gorton who was then occupied with the manufacture of benzine by the distillation of cannel coal—for the supply from the gas works was then not equal to the demand—sent him (Sir H. Roscoe), some of the light oils which he obtained in his process. They were of no commercial value, and had not been investigated. He submitted these oils to Schorlemmer, knowing their investigation was a hard nut to crack, but knowing also that Schorlemmer was the man to crack it. The examination of these oils was the beginning of Schorlemmer's scientific fortune. Schorlemmer's scientific work was written in every manual of organic chemistry throughout the world, and had been described fully in his own "History of the Rise and Development of Organic Chemistry," recently edited by his pupil, Prof. Smithells, whilst his investigations on the constitution of the hydrocarbons, marked an era in modern organic chemistry. Whilst his work in itself had a purely scientific value, it, like much other work of a similar character, enabled other men to build up an industrial structure, the value of which was measured by millions of pounds sterling, and gave now employment to thousands of men. For it was not too much to say that without Schorlemmer's discoveries, the knowledge of the constitution of the carbon compounds which we now possess, as typified by Kekule's theory, could not have been arrived at. Schorlemmer's power of work was simply prodigious, and his knowledge of chemical literature deep as well as broad. He much valued and made use of their admirable medical library. He, of course, lived and died a poor man, though had he chosen, he might have amassed a large fortune. His distinction was, however, none the less on that account, but, as some would think, all the more.

Dr. Ludwig Mond said the opening of the first laboratory solely devoted to the study of organic chemistry, at the only University in England, which could boast of a professor of that subject, marked a distinct step forward in the development of science in this country. In dedicating that laboratory to the memory of Schorlemmer to whom science and that university owed so much, they must all regret that it was not vouchsafed to him to have the use of such a special laboratory at his disposal. Nevertheless, the spirit which he infused into his work, his pupils, and his books would be the most valuable endowment which the new building inherited, and would manifest itself in the work of all those who had the good fortune to work there, if they approached their task with the same single-mindedness and love of truth that marked the late Professor Schorlemmer. His work had been singularly fruitful in clearing up and putting on a sound basis the modern theory of organic chemistry, called by him so appropriately "the chemistry of the carbon compounds." For it was Schorlemmer who provided the fundamental proof of the equal value of the four valencies of carbon, the very corner-stone of the great edifice by which we had obtained an insight into the simple laws upon which the immense variety of organic compounds was built up. And the value of the work not only extended to the chemistry of carbon, for the more they succeeded in penetrating into the constitution of the more complex compounds of other elements, the more they were forced to apply the same laws which they owed to the study of organic chemistry, to explain their constitution. —*Pharm. Journal.*

Resorcin as a Reagent for Albumen.—M. Carrez proposes to use resorcin as a reagent for albumen in the urine. To make the test, he takes one gramme of resorcin and dissolves it in two grammes of cold water; 2 cc. of urine are then poured carefully on to the resorcin solution. If the urine contains albumen, a white ring is formed between the two layers of liquid; alkaloids, urates, and urea are not precipitated by resorcin; peptones gives a precipitate, which disappears on warming, so that the test tube should be placed in warm water for a few minutes, when the precipitate is obtained. If it disappears, it is due to peptones. The test is very sensitive.

CONDENSED MILK PREPARED BY HOT AND COLD PROCESS.

BY BYRON F. McINTYRE, PH. G.

The residents of our large cities are familiar with the unsweetened varieties of condensed milk, and to a larger extent the people of the whole country are acquainted with the sweetened or canned condensed milk, and yet how little is known of the detail and method of preparation of these important food products.

The farmer contributing his share of the raw milk to a condensing factory can testify to the restrictions, inspections and obligations exacted by the factory management to secure pure milk, but the consumer rarely discovers the untiring vigilance and scientific methods put forth to insure a palatable and pure condensed milk.

The art of condensing milk has been perfected largely through improvements in mechanical details, but the so-called "vacuum principle" of removing water from milk, remains unchanged, and is the universal process of condensing not only milk but many liquids injured by high temperatures. A brief consideration of this "vacuum principle" and the mechanical appliances necessary for its operation, may refresh our knowledge, and be helpful by way of contrast with the essential features of the preserving or cold process of condensing.

A vacuum is defined as an enclosed space void of air or matter, and by vacuum principle we express briefly such a combination of pumps, condensers and tight enclosures or pans, as will permit of drawing from the whole apparatus the larger proportion of air contained therein, so that a boiling process can be carried on in the pans at a very low temperature or under vacuum conditions. The importance of this reduction of quantity of air in the pan is seen when we consider that normally, or with the atmospheric pressure at fifteen pounds to the square inch, a boiling temperature would register 212° F. With but seven and one-half pounds of atmospheric pressure, or one-half of the air pumped out of the apparatus, the boiling temperature would register 170° F., and with nearly all of the air pumped out, the boiling would continue actively at 100° F. In other words, a vacuum process is perfect just in proportion to the low temperature obtained and held during the working of same.

It is apparent that there must be destructive changes in the milk when heated to 212° F., otherwise the necessity for vacuum conditions would not exist, so that an inquiry as to the chemical changes, must apply to temperatures below 212° F. Authorities can be quoted confirming the statement that serious chemical changes are wrought in milk by vacuum process temperatures, decreasing the nutritive value of the milk, and producing a series of decompositions, occasionally noticed in burned flavors, that renders the product unlike plain milk in its constituent parts.

The consumer and non-expert observer will notice that the physical characteristics of vacuum process condensed milk are; loss of fresh milk odor, almost complete destruction of fresh milk taste, and when mixed with water, to dilute to original milk, there is no separation of cream or milk fat, as in plain or fresh milk. The toleration of the human stomach of material digestable, and questionable, is well known, particularly in food stuffs, both cooked and uncooked, and while we have in normal milk a universal food suited to all ages of the human family, whether in health or sickness, there is a growing volume of evidence from scientific physicians and chemists, unfavorable to the reputation of milk in any form that has been artificially heated, whether for sterilization or condensation.

It is a fact that there can be no successful condensation of milk, either by the boiling or freezing process, without a rigid inspection of milk from properly fed cows. Fresh or new milk, because of excess of inorganic constituents, and deficiency of albuminoids, should be evenly distributed throughout the year, by proper management of the sexual relations of the herds, and every precaution must be exercised in the aerating, cooling, care of milk in transit from dairy to factory, and in the cleanliness of utensils. Negligence of these details opens the door to disastrous germ contamination.

The cold process of condensation involves principles the opposite of boiling, the central idea being to duplicate artificially the phenomena as observed in nature, and by securing an upper surface refrigeration or freezing effect, all solids are rejected and pure ice only is formed. The familiar fact of boyhood days, of lifting a transparent pure sheet of ice from the surface of a mud puddle, may be duplicated from the milk in the freezing process. The successful production of thin layers of ice is a special feature of the process and can only be accomplished by having the freezing trays of metal, and suspended in a zero chamber, free from insulation or direct contact with the walls of the chamber. Under these conditions there is perfect rejection of solids until such time as the layers of ice becomes sufficiently thick to act as an insulating covering, when the ice and solids freeze at metal contact. This layer of ice, however, is crushed at periodic intervals, and thereby the freezing effect is confined to the upper surface, and no ice is formed at metal contact. The production of solid ice for the removal of water from solutions has been an industrial process of limited application, applied to the concentration of acids and alcoholic liquors, and in every instance known to the writer, the ice freezes solid from either a metal, stoneware or wooden vase, and this ice appropriates very largely inseparably dissolved salts, mechanically suspended particles, gases and odors.

In the surface process of freezing, there must be space contact on one side and liquid contact on the other side of the film of ice, to have a perfect rejection of solids. The ice formed by this process on black coffee, or strong hydrosulphuric water, if rinsed is odorless, tasteless and pure, when frozen in thin layers.

In the boiling of water, we find that, irrespective of the force of the heat and rapidity of the boiling, if the steam is unconfined, the temperature of 212° F. is not exceeded, and in the freezing chamber or closet, irrespective of temperature, which may be ten degrees below zero, the milk will remain at 32° F. as long as there is unfrozen milk.

From recent reliable data, working with the highest type of refrigerating apparatus, as compared with a single-effect vacuum apparatus, there is practically the same efficiency in converting the water of milk into steam and ice respectively. The direct product in each example is condensed milk, and the indirect or by-product is steam in the boiling process, which is in practice a waste, and in the freezing process it is ice, with a marketable value as a refrigerant.

The several features of the process covered by letters patent and patent applications of the inventor need not be detailed in full, but briefly it may be stated that when the milk is first received in the factory, it is examined and a sample put aside at the receiving platform, and at once passed over Baudelot coolers, where the temperature of the milk is reduced to within two degrees of the cooling medium, after which it is standardized to a definite percentage of milk fat. All possible germs are thus at once arrested in their development, a marked contrast to the vacuum process, where the milk is held warmed and ready for the vacuum pan for one or two hours, but unfortunately under very favorable conditions for germ growth. The cold milk from the cooler flows into shallow metal pans properly mounted on trucks and track, connecting with the freezing closets, in which are arranged direct ammonia gas expansion pipes. The pans have an upper surface area of about fifty square feet, and one or two hundred gallons have been found a proper charge for each pan. The rapidity of the freezing effect can be doubled by spreading the milk over one hundred square feeet of surface. The temperature of the freezing closet is kept at or near zero, and the milk is permitted to freeze until a film of ice is formed, when an automatic stirring apparatus breaks the ice into particles or crystals. This operation of film freezing and breaking up continues until all of the milk is converted into a mushy mass of ice crystals, with thick milk held between the crystals of ice. This mixture of crystals and thick milk is poured into a rapid-running centrifugal machine, with an instant separation of the condensed milk from the crystals, the latter forming a heavy bulk of hard snow. When assayed this snow shows about two-tenths of one per cent. of milk solids.

The first freeze usually separates one-half of the water in the milk, and two additional freezes are required to reduce it to proper consistence.

Estimating that milk contains eighty-six per cent. of water, seventy-eight per cent. of this water can be frozen to ice and readily separated with a centrifugal speed of fifteen hundred revolutions per minute in a thirty-inch basket.

The limit of condensation is not a question of converting water into ice, but rather a problem of detaching the heavy, tenacious condensed milk from the ice crystals, which is accomplished by increasing the speed of the centrifugal proportionate to the density of the milk.

In practice the condensation is usually four to one on a milk fat basis, which forms milk of sufficient density to meet the public demand. When the condensed milk is diluted with water, it dissolves completely, forming milk of normal flavor, taste, and from which cream will separate as from ordinary milk. When subjected to the Babcock method of fat testing, the fat separates clear as with ordinary milk, quite unlike this test when applied to the condensed milk by the boiling process, which gives a mixture of clear and broken-down products, that prevent a satisfactory reading of the milk fat.

In keeping qualities the cold process condensed milk will rank with the so-called pasturized standard, the destruction of germ life at 32° F. seems quite as extensive, as the heating or pasturizing by heat at 174° F.

The prolonged keeping qualities of ice cream at low temperature, often for weeks without impairment of taste or flavor, naturally confirms the statement that no detrimental changes are wrought in the milk by the freezing temperatures, and careful chemical examination fails to discover decomposition effects in the constituent parts of the milk.

Butter and cheese can be made from the diluted condensed milk and the action of the organized ferments is the same as in normal milk.

The cold process has been applied to other products requiring condensation, with signal success, in albuminoid solutions, and particularly when the integrity of flavors is desired, and where ferments are wasted and made inert by heat, or their power diminished by the production of secondary products of little value.

An incidental advantage of the process is that unskilled labor can be used, and that in whatever way the process may be employed in its industrial applications, the by-product ice has some compensating value to offset the fuel account.

East Orange, N. J.

ARGON.

Lord Rayleigh delivered a lecture on "Argon," on the 5th inst., at the Royal Institution of Great Britain, which naturally proved a great attraction, and the lecture theatre was crowded half an hour before the commencement, the audience including Mr. A. J. Balfour, M. P., Sir Frederick Abel, Sir Henry Roscoe, M. P., Professors Dewar, Rücker, Ramsay and Roberts-Austen.

The lecture resolved itself into a popularized version of the communication read before the Royal Society on January 31, but several facts of additional interest were disclosed, and various methods for the preparation of argon experimentally described.

At the outset, Lord Rayleigh referred to the lecture which he gave some four or five years ago on the densities of oxygen and hydrogen gases, and the conclusions drawn therefrom, and described the experiments which caused him to suspect the presence of another constituent in the atmosphere. In the first of these a process introduced by Professor Vernon Harcourt, air was bubbled through liquid ammonia, the relative weight of the nitrogen so obtained being noted. After concordant results had been obtained, nitrogen was prepared by the ordinary process in which air is passed over red hot copper, when copper oxide is formed, and it was noticed that the relative weight of the gas so liberated was $\frac{1}{1000}$ part more than the mean of that prepared by the first process. This was three years ago, and the discrepancy troubled him a good deal, various theories being advanced to explain it. The most useful suggestion was one made by "Nature" to the effect that, by the first process partial dissociation of the nitrogen from the ammonia had taken place.

If that were true, the discrepancy was explained at once, but the theory was discredited—first, by storing a sample of chemically prepared nitrogen for several months, when no change occurred; and secondly, by the fact that the silent electric discharge had no sensible effect on nitrogen prepared by either process. Further, the difference between the relative weight of the two gases was confirmed by preparing "chemical" nitrogen by a variety of other processes, and by bubbling oxygen instead of air through the ammonia in Harcourt's process Generally speaking, it was found that "chemical" nitrogen was ½ per cent. lighter than "atmospheric" nitrogen. At this stage in the research he asked himself: "what evidence have we that the nitrogen of the air is all of the same kind?" and on setting this question to Professor Dewar, was referred by him to Cavendish's work. Lord Rayleigh referred in detail to that chemist's researches on the composition of the air, and showed the Wimshurst's electrical machine which was employed for sparking mixtures of common air and dephlogisticated air (oxygen); at the same time pointing out how Cavendish to a great extent solved with his crude apparatus the question now raised after a lapse of more than a century. Indeed, he had himself used a modification of

Cavendish's apparatus for the preparation of argon on the large scale. By this process, which he had adopted at Mr. Crooke's suggestion, alternating currents from the main of the Electric Supply Company—in connection with the Royal Institution—are passed through a Ruhmkorff's coil, high potential transformers being used, and thence through bent glass tubes, filled with mercury and fitted with platinum points, into a large glass globe in which are the mixed gases. Arrangements are made by which absorption by strong caustic alkali takes place after sparking, until the residue resists the prolonged action of the current; and the top of the globe is cooled by encircling it with a jacket of sheet lead through which a continuous current of cold water passes, thus forming an efficient condenser. It is essential that the platinum terminals should be very massive, so as to resist the enormous heat generated, and the collecting vessel must be made of glass. With this improved apparatus, seven litres of the mixed gases can be absorbed per hour when present in about equal proportions, and passed in automatically. The other process for making large quantities of argon has been perfected by Professor Ramsay, and consists in passing "atmospheric" nitrogen over red hot magnesium turnings contained in a combustion tube, when magnesium nitride is formed, the residue from the "atmospheric" nitrogen consisting of argon. The apparatus is necessarily rather complicated, but by its means argon can be obtained much more rapidly than by sparking; however, Lord Rayleigh rather prefers the latter method, as it does not entail such constant attention as the first. The gas prepared by either process is an exceedingly inert body, and it is supposed that the two products are identical. It has been found impossible as yet to produce argon free from nitrogen. It always contains at least 1½ per cent. of nitrogen, which can readily be detected by the spectroscope.

Since the reading of the communication before the Royal Society, several attempts have been made to induce argon to combine. Thus, no compound had been formed when exposed to the action of titanium at a red heat, although an inert body like nitrogen does. But during the last few weeks, Berthelot has stated that by the action of the silent electric discharge it can be absorbed by the vapor of benzine; and so recently as the last few days Lord Rayleigh's son and Professor Meldola had tried to form a compound by sparking argon and acetylene together, when it was noticed that the volume of gas increased, although when acetylene alone was sparked no increase was observed.

Determinations of the solubility of argon in water show it to be the same as oxygen and about two and a half times as much as nitrogen. These are of special importance as affording indications of good sources of argon on a large scale, owing to the much greater solubility of argon in water than nitrogen. In fact, Lord Rayleigh had recently received from Manchester argon which had been obtained from the condensing water of steam engines. Turning to the spectrum of argon, allusion was made to the indebtedness of the speaker to Mr. Crookes for his work on the subject, and tubes of rarefied argon were shown, which, when illuminated by an electric discharge, were red or blue, according to the character of the current employed. Spectroscopic examination had also been utilized in an attempt to distinguish between argon prepared by the alternating current method and that by the magnesium method, although no difference had been detected. A radiometer that Mr. Crookes had charged with argon during the last few days was shown, and when placed in the electric beam, revolved rapidly. The density of argon prepared by magnesium had been carefully determined and fixed at 19.9, whilst that obtained by sparking was approximately 19.7. One of the most important properties of argon was the ratio of its specific heat at constant pressure and constant volume, which we found to be 1.65, and hence approaching to the theoretical limit of 1.67. It is hence concluded that it has no energy, with the exception of that of the translation of its molecules, for if it had any other energy it would drop below 1.54, or even lower still. Upon the basis of the ratio of the specific heat of argon has been founded the theory of the monatomicity of argon.

Lord Rayleigh, in his concluding remarks, devoted some attention to questions which naturally occurred concerning argon. He would have ignored the question as to argon being a new gas or not, had he not seen that morning a suggestion advanced that it was merely nitrous oxide. Its presence in the air was, he thought, amply proved, both by the fact that otherwise the discrepancies would have been shown to be false ones, and that blank experiments only gave a small amount, comparatively, of argon, and the presence of this trace was no doubt due to the solubility of argon in water. Graham's method of atmolysis was described experimentally, and alluding to the suggestion put forward that argon is merely condensed nitrogen, it was shown that this theory was not likely to be tenable, as it was doubtful if it was consistent with the ratio of specific heats. In speaking of the nature of argon, Lord Rayleigh pointed out that neither he nor Professor Ramsay had ever suggested that it was an element, until they read their paper before the Royal Society; and also that proving it to be an element, was much like attempting to prove a negative. The question as to its being condensed nitrogen, represented by the formula N_3, was a very interesting one, but as its density ought then to be 21, and it has already been shown to be barely 20, the hypothesis does not seem to be tenable. Even if N_3 did exist, chemists are by no means in unity as to its probable properties, as Mendeleef was of opinion that it was explosive, whilst Professor Ramsay, on the other hand, says it would be non explosive.—*Pharm. Journal.*

THE UPLIFTING OF PHARMACY AT THE MEETING OF THE NEW JERSEY STATE PHARMACEUTICAL ASSOCIATION.

The 25th annual meeting of this association occurred on Wednesday and Thursday, the 22d and 23d instant, at Davis's Parlors, in the City of Newark, and it is not too much to say that it constituted one of the most notable occasions in the history of pharmaceutical institutions in this country. The fact that the New Jersey was the first State Association ever formed in the United States was alone sufficient to lend great interest to the occasion of its silver wedding, and many an association would have contented itself under such circumstances with the celebration of a jubilee in which self laudation, and the boasting over past progress would have formed the principal portion of the exercises. The officers and members of this association, however, resolved to go farther and make it not only the culmination of one period of good work, but the beginning of another which should constitute an equally important epoch in the history of American pharmacy.

The management of the occasion was in several respects novel. The members and guests of the association were cared for, so far as the cuisine was concerned, in the same room in which their meetings were held, so that the minimum amount of interruption and loss of time due to the taking of meals was experienced.

During Thursday forenoon, while the gentlemen conducted their business, the ladies, 42 in number, were treated to a delightful ride over a route which is equaled as a carriage drive by very few places the world over, namely, through the western portion of Newark, Orange, Montclair and Bloomfield, including a portion of the "Mountain Road." The afternoon was devoted to the reading of scientific papers. In the evening a banquet was served. Friday forenoon the "sheep" and the "goats" were again separated, the gentlemen visiting a chemical manufactory, while the ladies were shown through the Clark Thread Works. In the afternoon all enjoyed a delightful sail up the lovely Passaic, followed by a collation at Speer's Wine Establishment.

Although the entire series of exercises constituted a grand success and reflected great credit upon the management, yet two of the transactions to be recorded exceeded in importance all the other results combined.

In the afternoon a delegation was received from the State Medical Association bringing a report of the action taken by a joint commission of the two associations which had met to consider action looking toward a united effort to increase and extend the public benefits resulting from the practice of the two professions in that State. The occasion was more interesting because the Pharmaceutical Association, already regarded as the oldest in the United States, had been an offshoot from the Essex District Medical Association, which in turn is said to be, or to have developed into, the oldest State Medical Association of the country; also because both of the visiting delegates, Doctors Coit and Silver, had passed the first year of their professional life as pharmacists, studying medicine subsequently. Dr. Coit, moreover, was for some time after his graduation an instructor in materia medica in the New York College of Pharmacy. The commission recommended a more general subscription to, and a more faithful observance of, the ethical requirements which are supposed to govern the two professions. The report covered three divisions. 1st. The relations of the physician to the pharmacist ; 2d. The relations of the pharmacist to the physician, and 3d, the relations of both professions to the public. Under each division there were three general headings which cover the most important points involved and which in general were very similar to the code of ethics for many years printed in the prospectus of our college, but more recently, and as we think with poor judgment, omitted therefrom. The report was enthusiastically adopted, the commission continued and a resolution passed that they should have power to perfect the code along the lines indicated in the report.

An even more important proceeding was the treatment of a paper presented by Mr. Wm. C. Alpers of the State Board of Pharmacy on the subject of examinations by pharmacy boards and leading up to the presentation of a curriculum for candidates which he regarded as being required by the conditions of the profession. Mr. Alpers was careful to specify that this recommendation did not represent any official action which had been taken by his board, but stated at the same time that his fellow-members were in accord with him as individuals in approving the curriculum so presented. This curriculum he stated had been drawn up as the result of a careful study of the replies received in answer to a circular letter issued to a very large number of schools and boards of pharmacy throughout the country. The curriculum is here appended :

PHARMACY.

Assistant : Physical laws applied in pharmacy ; the balance ; different kinds of thermometers ; specific gravity ; spectrum ; weights and measures and different systems ; percentage-solutions, etc. ; percolation and maceration ; vehicles and excipients ; preparation of prescriptions.

Pharmacist : Potent drugs and their strength ; alkaloidal drugs ; incompatibles ; solubility ; assaying ; all official preparations, their ingredients ; difficulties in preparing them and how to overcome them ; reading and preparing of complicated prescriptions.

Mode of extracting alkaloids, glucosides, resins, etc.

MATERIA MEDICA (BOTANY AND PHYSIOLOGY).

Assistant : Vegetable morphology ; parts of a plant and their function.

Primary physiology ; different organs of the human body, their uses and functions, especially respiratory and ailimentary organs.

Official drugs ; habitat and medicinal properties.

Therapeutic terms, simple pharmacognosy.

Pharmacist : Systematic botany and vegetable physiology.

Natural orders of all official drugs ; growth of plants and their chemical constituents ; history of each drug from gathering to dispensing.

Therapeutic terms continued ; pharmacognosy, microscope.

CHEMISTRY.

Assistant : Inorganic chemistry ; symbols and terms, atomic and molecular weights ; chemical equations ; chemical incompatibles ; formulas of all official chemicals ; qualitative analysis.

Pharmacist : Inorganic chemistry; preparation of all official chemicals ; their possible adulterants, testing for and detecting adulterants. Quantitative analysis ; examples in stoechiometry.

Organic chemistry ; notation ; hydrocarbons ; ethers and alcohols ; chemistry of alkaloids, glucosides.

Analysis of water, urine, food, etc.

TOXICOLOGY, PRESCRIPTION, DOSES.

Assistant : Prescription with potent drugs ; doses of all drugs ; antidotes of potent drugs. Prescription Latin ; definition of Latin terms and abbreviations used in prescriptions ; translations of Latin prescriptions into English and *vice versa*.

Pharmacist : Symptoms of poisoning by drugs or chemicals ; antidotes and how to apply ; prescription difficulties ; testing for poisons in food or water ; examining contents of stomach ; bacteriology ; ptomaines and leucomaines.

The reading of this report and recommendation met with enthusiastic yet at the same time well-considered reception. Only one or two feeble objections were urged against their adoption, and, knowing the individuals who objected, we feel assured that their objections would disappear after a more careful consideration of the subject. Nearly all the speakers were very strong in their assertions that the action here recommended was in the direct line of the requirements for improving the condition of pharmacy.

Space forbids that we should, in this number, attempt an analysis of these recommendations of Mr. Alpers, or attempt to point out in detail the results as affecting the welfare of the profession by their adoption, but we shall take occasion to do so in the next number of THE ALUMNI JOURNAL. For the present it is sufficient to say that the association adopted the recommendations and unanimously resolved that the State Board of Pharmacy should be instructed by the said association, their virtual superior, that they should regard an adherence to the main features of this curriculum as requisite to satisfy their requirements of duty. H. H. R.

Alumni Notes.

EXECUTIVE BOARD MEETING.

Meeting called to order in Alumni Room, June 12, 1895, by President Graeser, at 8.30 P. M. There were pres- Miss K. C. Mahegin and Messrs. Graeser, Henning, Kirk, Herold, Johnson, Stover, Keale and Brun.

Regularly moved and seconded that reading of the minutes of the last meeting be dispensed with ; carried.

The report of the "Alumni Day Committee" being very satisfactory, it was accepted, on motion, and the committee discharged with thanks.

Mr. Chas. F. Keale reported for the "Summer Outing Committee," and since the advantages offered by the place the committee had chosen, were numerous, attractive and altogether satisfactory, the report was accepted, the outing to take place on Wednesday, June 26, 1895, at Cohn's Seaview Hotel, City Island, New York.

Mr. Henning reported for the "Medal Committee," which report was accepted, on motion.

Report of Business Manager of the JOURNAL : It was regularly moved and seconded that the report be accepted and placed on file ; motion carried.

Report of the Treasurer : Various bills were presented for payment, which were audited by Messrs. Johnson and Kirk, and ordered to be paid if found correct.

There being no other old business, the next thing in order was the "Installation of Officers." After a few well chosen and well directed remarks, the retiring President, Mr. Graeser, introduced the President elect, Mr. A. Stover, who then took the chair. The other officers being duly installed, two new members were proposed for membership in the Association : Theodore A. Merritt, 86 Grand st., Newburg, N. Y., '95 ; Agnes P. Mahoney, Hawthorn, N. J., '95.

There being no further business, the meeting adjourned on motion of Mr. Herold.

W. A. HOBURG, Sec'y,
460 W. 20th st.

CLASS '93.

HURRAH ! for '93. The boys are coming up strongly.

I AM receiving letters from eveywhere asking for invitations to the Outing. The Outing is an assured success, and, boys, a great share of the success is due to '93.

TWO more have sent their subscription for the JOURNAL, M. J. Wilson, of 230 Willis ave., and J. P. Colonel, of 3d ave. and 110th st. Fall in line, boys. Next ! !

WITH many regrets I state that genial Harry Heller declined to act on the committee, for, "I do not care to get credit for that, which will probably be all done by J. Tannenbaum," he wrote me. Oh ! Harry, so much sarcasm ! !

BY the way—'93 had a reunion dinner the other day. Mr. Horni, Mr. E. F. Lohr and Mr. J. Tannenbaum sat down to a 25 cent hash *Table d'hote* and opened a couple of bottles (Tomato-ketchup and vinegar for Kartoffel salad).

A SLIGHT mistake crept into the report last month, namely : Mr. Horni is at P. & S., not Long Island Hospital College.

ANOTHER Benedict added to the list is Julius Tannenbaum to Miss B. Goodman, Wednesday, June 12, 1895.

Rather a strange thing for one to report his own wedding.

THE following is a poem by one of our boys, who took a special course in Latin. I am not at liberty to reveal his name, because he is very modest, in fact modesty is his strong point, so he fears that the praise that he might get would overwhelm and unfit him for pill making. Let us respect his wishes.

To tell a tale of a Chemistus,
Ad pascem torem lat manorum,
Stood he upon his midnight trainus,
Ut fiat soces cogniscorum.
Good bye he bade to his amicibis,
Cum malto lances ex convocibis,
Ah? Never, never, never more,
Sunt ejusdum toscidor,
And in the country dwell.

GREMINGER is with Tyler, 678 2d ave., Joe Carol with Dr. King, 479 3d ave.

WILL HOBURG will summer it at Long Branch with A. Ahwood (the good-natured).

TEDDIE EDLICH, "Eh! you are full of green paint," is with Ebberhard, 10th ave. and 22d st.

CORRESPONDENCE with '93 boys, those not yet heard from, particularly solicited.

JULIUS TANNENBAUM, PH. G.,
116 E. 116th st.

'94 NOTES.

VACATIONS are now in order. The time for a "little" recreation is at hand. I emphasize little, for after laboring hard all winter a week or two seems to glide away before one has hardly realized it, and then we must prepare ourselves for the fall trade.

FRANK HILLS is at his home near Syracuse, N. Y., where he will devote the summer months to the manufacture of butter and cheese, which should be materially increased under his guidance.

KIRK left on the 22d for Newport News, Va., where he will spend a couple of weeks with his folks on the banks of the historic James.

BREVARD CULP, who has been in Caswell & Massey's B'way and 26th st. store for some time, is now in their Newport branch, where he will spend the season.

I SAW Pond a short time ago. He was then with Scott's successors, 7th ave. and 14th st. Previous to that time he had been located in Brooklyn.

THE N. Y. C. P. Cyclers had a run on the 16th to Coney Island. Leaving the city in the morning at 11, they took the Bedford ave., Prospect Park and Ocean Boulevard route, arriving at the Island shortly after noon, where they bathed, dined, and spent a few hours examining the curios. On the run home a stop was made at Livingston & Wenzel's, where Born is practicing "elegant pharmacy." Five P. M. found them back in the city. The participants were Messrs. Dawson, Race, Clarke, Kirk and Col. Wade, '94; Ruckert, '97.

I OCCASIONALLY have a conversation over the 'phone with Van Tassell. He is with J. N. Hegeman & Co., B'way and 9th st.

NELSON S. KIRK, PH. G.
9 E. 59TH ST.

Vanilline.—Lippman states that he has found vanilline in *Nigritella suavolens*, growing upon the rocks of the Schiltalp, in the valley of the Lauterbrunnen, Switzerland. Besides vanilline, he states that he has found a body of the odor of heliotropine or piperonal, but has at present been unable to isolate it.—*Berichte.*

Pharmacy and Cycling.—The existing rage for cycling which has pervaded France, and especially Paris, has proved of great utility to pharmacists. No trade in the city uses the bicyclette for delivering parcels so much as chemists. The wholesale houses also use the "bike." For instance, the Pharmacie Centrale de France has a man who is employed in taking parcels out on a machine, and the arrangement seems to answer very well. The late Mr. S. M. Burroughs used to enjoy his early morning cycle ride in the Bois de Boulogne during his not infrequent visits to Paris. The students of the Paris School of Pharmacy are coming out strong as cyclists. They have arranged a race-meeting for Sunday morning next at half-past 8, in the Bois de Vincennes. The start will be made at 9 A. M., whether it be wet or fine. The distance is eleven turns of a course 2,750 metres round, and according to all appearances, the reunion will be a success. A banquet will be held at the termination of the race, to which the competitors can invite their friends.

Royal Gardens at Kew.—The original Botanic Gardens at Kew, of which Sir William Hooker was appointed director in 1841, comprised about eleven acres; the following year between three and four acres were added, and in 1844 by permission of the Queen forty-seven acres more.

Further additions were made in 1846 and 1851, and in the present time the Royal Gardens are 251 acres in extent. The meadow in front of the Kew Palace is now to be thrown open, so that visitors may have direct access to the finest part of the Aboretum.—*Pharm. Tour.*

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AN HISTORICAL SKETCH OF POISONS.

BY CHARLES E. PELLEW, E. M.

Although the art of poisoning reached its greatest development in Italy, it must not be supposed that other countries were ever entirely free from it. It was less prevalent in England than in most of the other European States, and yet, even there, it was found necessary, as early as King Henry VIII's time, to pass laws punishing poisoners by boiling to death.

The most celebrated case of poisoning in England occurred in 1613, during the reign of James I, and by the hideous revelations which it gave of the manners and customs of the court circles, it contributed in no small degree to the future unhappy fate of his son, King Charles. The victim, Sir Thomas Overbury, a prominent courtier, had been a close friend of the King's favorite, Rober Kerr, who, chiefly on account of his personal beauty, had rapidly risen in favor at court, until he had been made Lord High Treasurer of Scotland, with the title of Viscount Rochester.

The latter had been carrying on an intrigue with the Countess of Essex, one of the most beautiful and most licentious women of the court, and, strongly against the advice and entreaties of Overbury, determined to marry her. A divorce suit was begun, one of the *causes celebres* of the English bar to this day, upon most scandalous grounds, and while it was running its course, Overbury made so many and such vigorous protests that he enraged Rochester and the Countess to the pitch of murder. They brought him into disfavor with the King, had him consigned to the Tower, obtained the appointment of one of their tools as Lieutenant of the Tower, and another as keeper, and then proceeded to drug him. They obtained the poison through a fortune teller, and an apothecary, and administered them in various delicacies, pastry, game, wine, etc., which Rochester constantly kept sending the prisoner with letters of sympathy.

The range of poisons employed was considerable. They mixed arsenic with his salt, and cantharides with his pepper. His constitution was very strong—

indeed, it was stated on the trial that he had taken enough poison to kill twenty men—so they followed this up with mercury, lunar caustic, aqua fortis, powdered diamonds, and "a great spider." He still survived, and now began to have suspicions of foul play, though not of poison, and he began to write threatening letters to Rochester. So finally, six months after he had fallen into their hands, he was killed by a large dose of corrosive sublimate.

In spite of the suspicions aroused by his strange death, and hasty burial, Rochester duly married the Countess, with immense pomp, the King himself being prominent at the wedding, and for a time he continued to flourish. But soon the King grew tired of him, and his enemies began to press him, some of the subordinates were ferreted out and forced to confess, and finally Rochester and his wife were brought to trial before the House ot Lords. The Countess confessed, and was sentenced to death, but Rochester fought hard and fiercely for his life. He was overwhelmed at last by the Attorney General, Sir Francis Bacon, who brought, without scruples, the whole weight of the crown against him, and he was finally found guilty and condemned to death.

But now, for some reason, after pressing the trials most vigorously up to this point, James I hesitated to sign the death warrants. It was universally believed at the time that he dared not ; that Rochester knew some disgraceful secrets about him which he threatened to divulge. At any rate, after the guilty couple had lain in prison for some five years they were pardoned, to the huge indignation of everybody, and were even pensioned from the King's private purse. It is interesting to learn that their love had by that time turned to hate, and that, though they lived together for years afterwards, they detested each other so that for months they would not even speak.

It was in France, however, that the infamous Italian art developed to its fullest extent. It was probably introduced by Catherine de Medici, a daughter of the great Florentine house of that name, and the one who deluged all France with blood by the massacre of St. Bartholomew, and the civil wars to which it gave rise.

Maria de Medici, second wife of Henry IV, of glorious memory, who, after his assassination, governed France as regent with but moderate success, is also supposed to have been familiar with the art ; and undoubtedly in her train were those who both knew and practiced it. But it was in the days of the Grand Monarque, Louis XIV, that poisoning reached such a pitch that, as Madame de Sevigné says in one of her letters, it was feared lest Frenchmen and poisoner should come to mean the same thing.

The first great shock given to the court, thence to all France, from this cause, was the sudden death in 1670 of the beautiful, brilliant Henrietta, daughter of Charles I of England, and wife of Philippe of Orleans, brother of King Louis. Henrietta, only twenty-six years old, was the life of the whole court, and a special favorite of the King, who had just employed her, with immense success, upon an important mission to England. She had been, however, for some time on very bad terms with her jealous and narrow-minded husband, and so it is easy to imagine the excitement when she was suddenly taken ill, while sitting with her ladies, and died in less than nine hours.

The grief and honor of the court can hardly be described. Of course, the suspicions were at first all directed towards her husband. We read, however, in

Saint Simon's Memoirs a detailed account of the whole affair, how the King, terribly excited, sent for his brother's steward and cross-examined him furiously. And how the latter finally explained that one of the husband's suite, who had made himself offensive to Madame, and had consequently been exiled to Italy, had forwarded the poison to one of his friends. That the latter, remembering Henrietta's practice of drinking a glass of succory water about seven o'clock every evening, had slipped into the anteroom a little before that, opened the closet where the maid had just set the pitcher, and dropped in the poison. One of the servants came in just as he was doing this, and berated him for meddling there. But he gave some simple excuse, and, quietly passing into the sitting room, he stayed there, chatting with the princess and her ladies until the fatal draught was brought in.

The King, according to Saint Simon, listened to this tale with intense interest, and then asked anxiously if his brother had been aware of the plot. "No, Sire," said the stewart, "none of us was so stupid as to tell him; he has no secrecy, he would have betrayed us." On hearing this answer the King uttered a great "Ah" like a man oppressed who suddenly breathes again, and then had the matter hushed up.

But, in spite of all efforts to avoid scandal, the terrible practice of poisoning was steadily spreading throughout the court circles. It first came before the ears of the government, as before in Italy, through the priests at confession, and as a result two Italian chemists were locked up in the Bastille for the offense of selling poison. One of them died, but the other, Exilé, lived there long enough to meet a young French officer, Gaudin de Sainte Croix, and through him to do an incalculable amount of damage.

Sainte Croix was a young adventurer, of good presence and of gentle blood, who had made the acquaintance of an elderly and dissipated nobleman, the Marquis de Bruivilliers, and, through him, of his young and beautiful wife. As was not uncommon in those days, the intimacy of the young people grew rapidly beyond the bounds of strict propriety, and, although the husband did not seem to mind, the young lady's father, M. D'Aubray, a man of considerable wealth and high position, had young Sainte Croix thrown into the Bastille, where, as fate would have it, he was assigned to the same cell as Exilé.

The young officer, enraged at his imprisonment, made full use of his opportunities, and, when he emerged a year or two later, and renewed his intimacy, although less openly, with the Marquise, he with her aid began to practice his new knowledge. It took them some time before they could prepare the poisons to their satisfaction, and they tried their poisons first on animals, then on servants and, occasionally, on friends, and finally, so at least it is stated by those who ought to have known, upon patients in the hospitals, where the fair Marquise, turned "religieuse," was in the habit of going regularly, carrying baskets of delicacies. Finally their experiments proved successful, and they began operations in earnest.

The first victim was good old M. D'Aubray, who, believing firmly in the thorough reformation of his daughter, died in her arms after a somewhat short illness. In order to inherit as much of his property as possible, they then attacked his children, and by the aid of a trusty tool, whom they introduced into the family as a butler, they poisoned both of her two brothers and one of her two sisters. The second sister, alarmed at this sudden mortality in the family, fled to the country and thus saved her life. The Marquise now turned her attention to her good-natured old husband; but here Sainte Croix interfered, probably thinking that as a wife she might be somewhat overpowering. And so, while *she* administered her poison in the morning, Sainte Croix would take occasion to administer an antidote in the afternoon, and the poor old gentleman managed to survive his wife's kindly attentions, although somewhat at the expense of his digestion. The Marquise confessed afterwards to have made ten different attempts to poison him, but she finally abandoned her efforts.

After this the couple employed their knowledge for the benefit of some of their friends, and they were building up quite a lucrative practice, when their career ended from an unfortunate accident. Sainte Croix, while working one day in his secret laboratory, inhaled some of the fumes, and was found the next day dead upon the floor. The police had their suspicions aroused by the circumstances and started an examination. They soon found a sealed casket, directed to Madame de Bruivilliers, and a note on it calling down horrible imprecations upon anyone who, after his death, should not take it at once to the lady. Naturally this excited curiosity, the box was opened, and in it was found several vials of poison and papers of various sorts directly incriminating the Marquise.

They captured his servant, Lachaussée, who confessed his share in the crimes, and was duly executed. Madame de Bruivilliers, however, fled to England and stayed there quietly for three years. She thought, by that time, that all had blown over, and so ventured to cross the Channel to Liége, where she took refuge in a convent. But the police had kept her in sight, and now made many fruitless attempts to get hold of her. Finally a handsome young detective was sent up there, dressed up as an abbé, and, calling at the convent, made desperate love to her. She fell at once into the trap, went out to walk with him one evening, and was suddenly clapped into a carriage and driven off to Paris.

The little woman, who behaved throughout with the utmost courage, faced her judges with perfect self-possession and flatly denied all the charges. But she soon found that the proofs were overwhelming, and finally, when brought face to face with the rack, she told them frankly that there was no need of torturing her, and confessed the history of her whole life with the utmost frankness. The details were horrible, implicating, it was believed, many prominent people, and the judges immediately ordered her to be executed the following day.

Immense crowds gathered to see the execution. Mme. de Sevigné describes in her graphic manner how she stood with her friends to see her taken by. She was scantily dressed, lying on a straw pallet, with a confessor on one side and the executioner on the other. But she did not lose her courage. When she saw the mass of people, including hundreds of her former friends, who had gathered to see her fate, she exclaimed contemptuously: "You have come to see a fine spectacle." She did once lose her temper, that was when she saw near her carriage the detective Degrais, who had captured her. She begged her confessor to "make the executioner stand in front of me, I don't want to see that scoundrel, Degrais, who took me." Her confessor reproved her for her temper. She said: "Ah, mon Dieu, I beg your pardon; let me then keep this pleasant sight." The executioner kept her for some minutes on the scaffold, posing her for the benefit of the audience, till the bystanders murmured. "It's all well," she said.

Finally he beheaded her. Her body was burned; and next day the people scrambled for her ashes, as for relics of a saint, and hunted Degrais, so that his life was in danger for months.

"Well, it is done! Bruivilliers is in the air!" So wrote Mme. de Sevigné to her daughter on the afternoon of the execution, July 17, 1676. "Her poor, little body was thrown into a big fire and the cinders to the wind. So now we are breathing her, and some poisoning inclination will soon seize us and astonish us all."

These words speedily came true. The judges foolishly published some of the evidence, and soon everybody knew that the best doctors and chemists in France had been absolutely unable to identify the poisons of Saneti Croix or to recognize their effects. As a result of this and of the attention called to the subject, f r the next few years a perfect mania of poisoning seemed to prevail in France. The materials were traced to an old midwife, La Voisin, who had in the past few years achieved a great reputation as a fortune teller and a sorceress. She had made a great fortune, was patronized only by the wealthy and fashionable, and, in concert with a woman called La Vigoreux, and an ex-priest, Lesage, had made, it appeared, a regular business of selling slow poisons under the suggestive name of succession powders.

These persons, and several minor accomplices, were arrested at the close of 1679, put to the torture and finally executed. In their house was found a list of their customers and patrons, which included many of the noblest names in France. All Paris was beside itself. The King raged and insisted on the matter being probed to the bottom. Statesmen, generals, ladies of the court, dukes and duchesses were thrown into the Bastille, and kept in close confinement, while a special court, the "Chambre Ardente," was hastily organized, with full powers to try offenders of the highest rank.

Some of these were probably accused on insufficient grounds. The Marshal de Luxembourg, for instance, although Marshal of France and one of her greatest generals, ranking in title and dignity next to royalty itself, was kept in the Bastille for fourteen months, under the terrible charge of having foully murdered a young girl. His trial was long and severe, but no sentence was passed, and it seems probable, from what we can now gather, that he had consulted La Voisin as a sorceress and not as a poisoner.

The same was, so far as we can tell, the case with one of the great ladies of the court, the Duchess de Bouillon, formerly Marie-Anne Mancini, a niece of Cardinal Mazarin. She was accused of trying to poison her husband for the sake of the famous general M. de Vendôme. She entered the court, accompanied by her husband, in the face of an immense crowd, and faced the judges fearlessly, answering their questions and insisting that she only went to La Voisin "to see the sibyls and prophetesses which she had promised to show her." "Did you see the devil," asked La Reynie, the oldest and most disliked of the judges, "after you had gone to look for him?" "Monsieur," she answered, "I see him here at this minute, disguised as a judge, very ugly and very horrid."

Her explanations satisfied the court, and she was discharged, to the great joy of her many friends and relatives. But her sister Olympia, Duchess de Soissons, whose beauty had some years before captivated young King Louis, was less fortunate. Her husband had recently died, under very suspicious circumstances, and the King, probably remembering kindly his old flame, sent word to her to escape in time if she felt doubtful about being able to clear herself.

She fled to Belgium with some of her friends who were also implicated, but town after town refused to receive them—"we will not have those poisoners."—They were received for a time at Brussels, but soon the people drove them out, hooting them and insulting them at every opportunity. Finally they took refuge in Spain, and, although with some difficulty, obtained some footing at court. But the sudden death of the young Queen of Spain, daughter to Henrietta of Orleans mentioned above, was at once attributed to her, and she fled to Italy, where she died, years afterwards, in poverty and disgrace. About three years after her flight her son, the gallant Prince Eugene, then a lad of twenty, petitioned Louis for a commission, but was refused. He entered the Imperial service, and, twenty years afterwards, on the battlefield of Blenheim and elsewhere he materially helped to cripple the power of the French army.

These names were probably the most prominent of those implicated, but many others of most equal importance came under the rigor of the law. Some were executed, others banished, others still fined and disgraced. Under this treatment further open outbreaks of the crime were prevented, but the evil was not eradicated. All during the long reign of Louis XIV. the fear of poison hung like a dark cloud over the gayety and frivolity of the court. Towards the end of his life, 1711, several members of his immediate family, almost all in the line of direct succession to the throne, died suddenly one after the other. At once the word was passed that they had been poisoned, and terrible suspicions fell on the young Duke of Orleans, who, if the direct line failed, would be the heir. Finally but one sickly boy, afterwards Louis XV., was left between Orleans and the King, and again the rumors were spread that his life had only been saved, when at the point of death, by the skill and devotion of his governess, who had administered an Italian antidote, and had warded off later attempts on his life. And probably, of all the misfortunes and sorrows which crowded on Louis during the last years of his life, nothing grieved him more than the necessity of entrusting both throne and heir to the guardianship of one whom everbody shunned and dreaded as a poisoner.

Argon in Minerals.—I have obtained from certain mineral gases which seem to contain argon, and perhaps also helium. Minerals of the samarskite group when heated to some particular temperature commence to glow, and this appearance has hitherto been ascribed to a molecular rearrangement. As I could not find any account as to whether the weight was in any way changed in this action, I have recently, with my assistant, Mr. Young, A. R. S. M., heated euxenite and samarskite in vacuo and extracted the gases. At the moment of glow a large quantity of gas—12 times the volume of the mineral—is given off. This gas we have sparked, and the color and spectrum point to a hydrocarbon being present. On adding oxygen to the gas and exploding, there is a decided contraction, and after introducing potash, a further great contraction. After the excess of oxygen is absorbed, the spectrum is no longer like a hydrocarbon, but has a close resemblance to the argon spectrum, according to the published accounts. We have so far obtained the same results from euxenite as from samarskite.—*Extract from a letter from Professor W. R. Eaton to the Chem. News.*

Ethyl carbonate of parace'amido-phenol is a crystalline white powder, tasteless and odorless, soluble in alcohol and slightly soluble in water. It is recommended as an antithermic, analgesic and hypnotic. Periodosulphate of thalline is a crystalline body, nearly black in color. It is a combination of talline sulphate and iodine, and is recommended in cases of tumors.—*Repertoire.*

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PATENTS ON MEDICINAL PRODUCTS.

Among the various topics that will probably come up for discussion at the American Pharmaceutical Association at Denver will be one of unusual interest. It will need be approached in a broad spirit with due consideration for the rights of all involved.

We refer to the question of the patenting of medicinal articles.

While the broad fact that the workman is worthy of his wage, and that the inventor should receive a proper reward for his discovery is indisputable, yet humanity demands that the reward should come in a different and more general way, and not as a direct tax upon those, who, by reason of illness, are often least able to bear them.

The tendency of modern medicine lies in the use of remedies of which antipyrine and sulfonal may be taken as types.

Many of these remedies have undoubted therapeutical value; indeed, the practitioner of to-day, if deprived of these new and improved methods of treating disease, would find himself seriously handicapped. It is because of the price charged by manufacturers for these products that the point in question has assumed serious aspects.

Sulfonal, which may be taken as an example, has been sold in this country for about five times as much per ounce as it could be purchased for in Germany. It is also highly probable that the discoverer reaps but a small share of the benefit of this extortionate price.

Now, in granting a patent, under the present existing conditions, the government assumes to protect the inventor in the sole rights of his invention or discovery for a certain number of years, and thereby inherently guarantees him a certain pecuniary reward, depending largely upon the usefulness to the masses, of the invention or discovery.

Unfortunately, the inventor rarely reaps the real benefit; the patient toil, experiment, and often great expense to which he is put, frequently compel him to part with his rights, in advance, for a small sum. Only too often this ends in disappointment and poverty; sometimes suicide.

With the Patent laws, as they apply to

the arts and manufactures, this article has nothing to do; but in regard to medicinal compounds the laws should be so changed that while the inventor is not deprived of his rights, and the incentive thereby to original investigation and experiment destroyed, a higher ethics demands that the community should bear the burden rather than the few. This is the tendency of the times; there are many advocates of the general government enlarging its powers in thus caring for the welfare of the people.

Judge Henry B. Brown, in an address delivered before the Graduating Class of Yale College, says: "If the government may be safely entrusted with the transmission of our letters and papers, I see no reason why it may not also be entrusted with the transmission of our telegrams and parcels, as is almost universally the case in Europe; or of our passengers and freight, through a State ownership of railways, as in Germany, France, Austria, Sweden and Norway? If the State owns its highways, why may it not also own its railways? If a municipality owns its streets and keeps them paved, sewered and cleansed, why may it not also light them, water them, and transport its citizens over them so far as such transportation involves a monopoly of their use? Indeed, wherever the proposed business is of a public or semi-public character, and requires special privileges of the State, or a partial delegation of governmental powers—such, for instance, as the condemnation of land, or a special use or disturbance of the public streets for the laying of rails, pipes or wires — there would seem to be no sound reason why such franchises, which are for the supposed benefit of the public, should not be exercised directly by the public."

Instead of granting patents for the discovery of new compounds intended to be used as medicines, the government should establish a commission to inquire into the merits of all new bodies, to confer upon the discoverer a title of distinction, and grant him a royalty for a certain period of years, if his discovery be found meritorious.

This would insure a reward to the inventor that no speculator could rob him of; while the more important consideration would be the making public of the manufacture of the new compound, which would soon find its proper level as to price through the ordinary competitions of business.

It would serve the purpose also of stimulating new discoveries, for reward would certainly then await the inventor, and mankind in general would be the gainer in the end. It would have the further effect of sanctioning the use at once of a valuable remedy, which might otherwise remain neglected; on the other hand, it would prevent imposition being practiced upon the public by unscrupulous manufacturers.

The new College Prospectus, of which forty thousand have just been issued, is now ready for distribution. Among the most interesting announcements is the one relating to the Post-Graduate course. This is one of the most important steps ever taken by the College, and one which will redound to her honor. In outlining the scope of the work to be done, we cannot do better than quote from the Prospectus:

"The course of Post-Graduate instruction, to be inaugurated by this College, is intended for graduates in pharmacy of this or any other college offering equivalent undergraduate instruction.

"The instruction will be practical throughout the entire year, hence students must come prepared in the theoretical work preliminary to quantitative chemical analysis, higher pharmacy, pharmacognosy and materia medica."

Application for the Prospectus should be addressed to the Clerk, Mr. O. J. Griffen, at the College of Pharmacy Building, 115-119 West 68th street.

THE MOST RECENT WORK.

Polystichic Acid.—Poulsson, of Christiania, who worked for some time on the acids of *Aspidium filix mas* and *A. altamanticum*, has again examined two ferns—*Asplenium filix fœmina*, with little result, and *Polystichum spinulosum*, in which he found an active acid. The dried and chopped-up roots (or rhizomes) are extracted with ether, and the extract is shaken with diluted baryta water, and the alkaline solution is separated from the ethereal layer. The ether taken up by the water is driven off by an air current, and the solution is filtered, acidified with HCL, and the resulting precipitate is dried and dissolved in ether and alcohol. After purification, this body, polystichic acid, forms yellow needles, melting at 123°, of the formula $C_{22}H_{24}O_9$. A second acid, melting at 150°, of the formula $C_{22}H_{26}O_9$, and forming yellow crystals, is also obtained, which the discoverer names dihydropolystichic acid.—*Apotheker-Zeitung.*

Tussol.—This body, which was introduced recently as a new remedy, and described in various ways, appears actually to be a compound of phenylglycollic acid and antipyrin, of the formula:

$$C_6H_5CH\begin{matrix} \diagup OH \\ \diagdown COOH \end{matrix} \qquad C_{11}H_{12}N_2O$$

—*Journal der Pharmacie d'Elsass.*

Methylene Lactate. — This body, the first known representative of this class of esters, is prepared by allowing equimolecular quantities of lactic acid and polymerized formaldehyde to stand in a warm place for some time, and then distilling. The body probably has the formula:

$$\begin{array}{l} \quad\;\; CO-O \\ \qquad | \qquad\; >CH_2 \\ CH_3-CH-O \end{array}$$

The compound forms a colorless liquid of specific gravity 1.197. It boils at 153° C. Its melting point is 28°. It possesses a strong odor and a sharp taste, and is insoluble in water, but breaks up into its constituents on warming with it. Silver nitrate is strongly reduced by it.—*Comptes Rendus, Brit. Col. Dr.*

Ferratin.—The following details are given of the preparation of ferratin. 100 grammes of egg albumen are placed in a mixture of 21 C.c. of water and 70 C.c. of solution of caustic soda (10 per cent.). 20 grammes of tartrate of iron are dissolved in water, and, if acid, as it generally is, it is neutralized with sodium carbonate. The two solutions are mixed and left for five or six hours, and then transferred to the water bath. The black coloration, due to the formation of sulphide of iron, will disappear towards the end of the process. After cooling, tartaric acid is added to faint acidity. The precipitate formed is dissolved by the addition of a little ammonia, and excess of this is driven off by exposure to the water bath. It is then filtered, and when the filtrate is cold, the ferratin is precipitated by a solution of tartaric acid, which should only be added in just sufficient quantity. It is filtered off, washed with water, alcohol and ether, and dried.—*Journal de Pharmacie d'Anvers.*

Truxillinic Acids.—These acids, of the formula $(C_9H_8O_2)_2$, are derivatives of the truxillines, bases existing with cocaine in coca. They are, in fact, cocaines in which the radical of benzoic acid is replaced by that of truxillinic acid. A truxillinic acid forms fine needles soluble in alcohol, and melting at 276°.—*Merck's Jahresbericht.*

On the Density of Helium.—M. Langlet, who is occupied in the University of Upsala on the study of helium, has lately determined its density. The gas extracted from cleveite was freed from hydrogen by passing it over oxide of copper heated to redness, and from nitrogen by means of metallic magnesium. It did not contain argon. Its density was found to be 0.139 (air=1), or 2.02 (hydrogen=1).—*Chem. News.*

Cyanic Ethers and Nitriles of the Alcohols.—Albert Colson has exposed to the sun a mixture of washed ether and cyanogen chloride. The product was methane. On exposing the same mixture to the sun during the whole of summer, he obtained an isomer, very stable. The author has further obtained cyanal acetate, propionate, and proplycyanal acetate.—*Chem. News.*

Luteol:—a new Indicator.—This substance is recommended by Dr. W. Autenreith as an indicator in alkalimetry (*Arch. d. Phar.*, 233, p. 43). It is insoluble in water, but dissolves readily in alcohol. For analytical purposes, a solution is made containing 1 gramme in 300 C.c. of rectified spirit and of this solution three, and at the most eight drops are used at a time. The luteol solution gives a yellowish color with alkalies, and is even more sensitive to ammonia than Nessler's solution. For example, a single drop of ammonia solution was mixed with a litre of water, and to 5 to 10 C.c. of this mixture a few drops of the luteol solution was added, the result being an evident yellow color, while Nessler's solution only showed a reaction after a short time. Luteol reacts similarly with fixed alkalies, but does not react with free acids.

Quinoline Sulphocyanate.—This combination is being put forward by Merck as a strong antiseptic, possessing every advantage of phenol without any of its offensiveness. Pus, diphtheria and cholera organisms are rapidly destroyed by it. It is recommended in cases of blennorrhagia.—*Pharm. Zeitung.*

Methyl Salicylate has been found in Gaultheria Procumbens L. G. Punctata, Blume; G. leucocarpa, Blume; G. leschenaultii, D. C.; Betula lenta, Willd; Polygala senega L.; P. alba; P. vulgaris; P. depressa, Wender; P. calarea, F. Schulz; Monatropa hypopitys; Laurus benzoin; Spirae Ulmaria, L.—*Pharm. Journal.*

Codeine.—M. Goelich (*Arch. der Pharm.*) has obtained a compound of codeine and ethylene bromide by heating a mixture of the two bodies in a sealed tube for several hours at 100° C. After several recrystallizations, he obtained a salt in small crystals, having a melting point 177°-179° with the composition

$$2C_{18}H_{2}.NO_{3}+C_{2}H_{4}Br_{2}+H_{2}O.$$

Artificial Glucosides—Not content with his famous synthetic work on sugars, Professor Emil Fischer is hard at work on the preparation of artificial compounds of these bodies with alcohols, that is, of elementary glucosides. He has prepared and described the following: Methyl glucoside, both the dextro and laevo-bodies, ethyl glucoside, methyl galactoside, methyl glucoside, the methyl compounds of glucoheptose, a seven-carbon sugar, xylose, rhammose, sorbose and fructose. There is no doubt that in the hands of Fischer, the chemistry of the glucosides will undergo some remarkable developments.—*Br. and Col. Dr.*

Chitine has been obtained from Agaricus competris and from ten other species of mushroom by Eugene Gilson.

Chitine is a proximate principle heretofore only found in the animal kingdom; the discovery of its presence in the mushroom adds another body to the list of those common to both animals and plants.—*Chem. News.*

New Quinine Derivatives—An important paper on the chemistry of several new derivatives has just been published by O. Hesse. Crystalized quinine is digested in alcoholic solution with an equimolecular quantity of methyl iodine. After some time crystals of quinine methyl iodine separate out, and when pure corresponds to the formula.

$$C_{20}H_{24}N_{2}O_{2}CH_{3}I,2H_{2}O.$$

By digesting this iodine with water, and the equivalent quantity of silver sulphate, a neutral sulphate separates out, which possesses the composition.

$$C_{20}H_{24}N_{2}O_{2}CH_{3}2\ SO_{4}+6\ H_{2}\ O,$$

As determined by estimation of the water and the sulphuric acid. By mixing the aqueous solution with the proper quantity of baryta water, and evaporating under a dessicator, the corresponding hydroxide is obtained, easily soluble in water and alcohol, but insoluble in ether. The aqueous solution is strongly basic and corrodes the skin. Carbonic acid is easily absorbed with the formation of the carbonate.

$$(C_{20}H_{24}N_{2}O_{2}.CH_{3})_{2}CO_{3}+4H_{2}O.$$

The remainder of the paper deals with the action of halogen hydrides on the hydrobases and with apoquinine.—*Berichte.—Brit. and Col. Drug.*

New Antipyrin Compounds.—An important paper on some new antipyrin compounds has just been published in the *Berichte*, by Adolf Schuftan. Knorr had already shown that antipyrin combined with benzaldehyde to form a definite compound, and the author has now succeeded in preparing similar compounds with fatty aldehydes. He has described the formaldehyde and acetaldehyde compounds, and also the salicylic aldehyde compound. The bodies are easy to prepare, as the components combine, under suitable conditions, with the elimination of water, in the proportions of two molecules of antipyrin to one of aldehyde. The reactions take place as follows:

$$2C_{3}HN_{2}O(CH_{3})_{2}(C_{6}H_{5})+CH_{2}O=H_{2}O+ CH_{2}\begin{cases} C_{3}N_{2}O(CH_{3})_{2}(C_{6}H_{5}) \\ C_{3}N_{2}O(CH_{3})_{2}(C_{6}H_{5}) \end{cases}$$

—*Berichte.*

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Durand, Th., et H. Schinz. Conspectus florae Africae ou énumération des plantes

*Readers desiring any of the works contained in this list can obtain them through B. Westerman & Co., 812 Broadway. Gustav E. Stechert, 810 Broadway, or other foreign booksellers.

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INFLUENCE OF AGE AND SOIL ON CINCHONA TREES.

Mr. P. Van Leersum, the director of the government Cinchona plantations in Java, has recently published a further communication on his researches into the effect of age, soil and condition of health upon the alkaloids in living cinchona trees. A further analytical examination of fifty specimens of officinalis bark show that the exceptionally high percentage of alkaloids which had previously been observed in certain specimens of the species officinalis is not the result of cultivation. These unusually rich trees are either sporadic exceptions or they may represent a definite chemical variety within the limits of the same botanical species. The last fifty specimens analyzed did not include a single one exceeding the average alkaloidal proportions of the officinalis.

Continued investigations relating to the increase and decline of the alkaloidal richness of cinchona trees show that in diseased trees, the cinchonidine percentage increases at the expense of the quinine percentage. Van Leersum supports this statement by quoting thirteen analysis, of which the three following are particularly interesting :

	Quinine. p. c.	Cinchonidine. p. c
Succiruba and Ledger hybrid, healthy tree	10.7	0.
The same tree diseased	4 17	4.90
The same tree 1 year later	3.25	5.07

The analyses were made with the dry bark. Six other experiments show the harmful effect of an exhausted or poor soil upon the alkaloidal richness of cinchona bark, although cuttings of trees, impoverished in consequence of unsuitability of the soil, grafted upon healthy trunks appear to return to their original richness. Trees containing 10·29 per cent. of quinine while growing on good soil declined to 6.54 per cent. when transferred to a poor soil. One instance is given in which a healthy five-year-old tree contained 10.33 per cent. of quinine; at the age of fifteen, exhaustion of the soil had reduced the quinine percentage in the same tree to 6.06.—*Chemist and Druggist.*

HELIUM.

Professor Ramsay, at a recent meeting of the Chemical Society, read what many in the audience regarded as his first official paper on Helium, although he announced his discovery at the anniversary meeting. We are indebted to the *Chemist and Druggist* for the following interesting abstract of the paper:

Professor Ramsay first assigned a share of the credit to Dr. Norman Collie, who had, with Mr. Travers, been aiding him in his work. About forty different minerals, more or less rare, had been examined with the view of finding helium in them. It had been found in about fifteen of them. The chief sources up to the present were clevite, broggerite, samarskite, English pitchblende and monazite. He had specimens in vacuum tubes from all these sources, and handed round a dozen small direct-vision spectroscopes for the Fellows to examine the spectrum. The light was now turned down, and the giant Ruhmkorf began to speak. The helium spectrum flashed out to magnificent advantage, and those who did not know would have felt certain that the huge yellow band now called D_3 was the double sodium line, so great was the intensity. The methods used in obtaining the gas were the following: (1) Pumping out the gas evolved on heating the mineral in an evacuated piece of combustion tube (this often contained hydrogen and carbonic acid, with sometimes a hydrocarbon, but never any argon); (2) Powdering the mineral finely with $KHSO_4$ and heat; (3) Or boiling with H_2SO_4 (70 per cent.) preferably in a current of CO_2. The gas is purified by absorbing with KOH, mixing with oxygen, exploding over a little KOH and mercury, and it can then be passed over ignited magnesium and copper oxide when necessary. The spectra showed five specially brilliant lines—one in the red, then the famous yellow line, one in the green, one in the blue, and finally one in the violet. From pitchblende Professor Ramsay only obtained about ½ cc. from 70 grains of material. It "didn't pay to extract," said Professor Ramsay, amidst much laughter. Broggerite, a mineral which resembles cleveite, merely having the small quantity of yttrium therein contained replaced by thorium, is a useful source of the gas. In justice to Hillebrand he said that uraninite does give off large quantities of nitrogen, and he had received a letter from this chemist saying he had observed numerous strange and new lines in the spectrum, but had not been bold enough to assume he had discovered a new element. The remainder of the work was devoted to a study of the properties of the gas. He had taken the density of three samples obtained from the following sources: (1) Cleveite, (2) Broggerite, (3) Samarskite. The gases were in all cases finally passed over ignited magnesium, copper oxide and phospharic anhydride. All three gave a density of 2.2. Lest a misunderstanding might arise, he pointed out that he gave his original figure, 39, as the maximum density, not as the true density. The exact figure of the three samples was 2218, and on further being heated over ignited magnesium he had reduced this to 2133. He had only about 30 cc. to use for the determination, but this admitted of a reading with an error of less than 2 per cent. The wave-length of sound was also determined by the lycopodium method, and the result of the ration of specific heats at constant volume and constant pressure was found to be 1.652. For a monatomic gas this should be, theoretically, 1.66. So that the monatomicity was apparently established. Helium is the least soluble of all the gases, 100 volumes of water dissolving only 0.7 volume of gas. There were two lines in the spectra of helium and argon which were identical. Perhaps this points to the existence of some other gas or gases in both, which might allow the density of argon to be brought down to 38 and come just after chlorine in the periodic law. None of the minerals yielding helium re-absorbed it, and the question as to whether it has combined or not is still unsettled The spectrum of argon was then displayed.—*Pharm. Era.*

REACTIONS OF SOME OF THE NEWER REMEDIES.

(Continued from June issue.)

Piperazine (Diethylenediamine): Crystalline masses consisting of shiny glassy tablets, freely soluble in water; aqueous solution dissolves a large quantity of uric acid; platinum chloride produces a characteristic double salt, occurring in square leaflets; Nessler's reagent, as also mercuric nitrate, produces a white precipitate; cupric sulphate produces a voluminous, blue precipitate; silver nitrate is not precipitated; bromine water is energetically decolorized by piperazine; potassium permanganate is reduced by piperazine.

Salocoll (Phenocoll Salicylate): White flocculent powder, consisting of velvety needles having a sweetish taste; its aqueous solution produces a violet color with ferric chloride, the color being discharged on the addition of hydrochloric acid; on heating with a solution of sodium hydroxide, allowing to cool, and adding a trace of chloral hydrate, the odor of carbylamine is evolved; if it be dissolved in diluted hydrochloric acid, and, after the liberated salicylic acid has crystallized out on cooling, the solution be filtered, the filtrate yields a reddish-brown precipitate on the addition of a solution of iodine.

Salophen (Acetylparaamidosalol): Small, thin, yellowish-white, odorless, tasteless leaflets; on boiling 0.1 Gm. with 10 C.c. of 2 per cent. solution, the latter acquires, immediately, a blue coloration, which disappears upon further heating, the solution subsequently assuming a yellowish-red color; if this solution be exposed to the action of the air, a sky-blue coloration will be produced in its upper layers, the color being gradually communicated to the rest of the liquid.

Symphorol (Sodium, Lithium and Strontium Caffeinesulphonates): White, odorless, bitter powders. Symphorol Lithium and Strontium are readily soluble in water, while Symphorol is difficulty so; they are all insoluble in ether, benzol, or chloroform; their solutions, upon the addition of barium chloride or silver nitrate, become slightly turbid, but no precipsemble those of silicon,—*Merck's Report.*

Titanium Compounds have been the subject of recent study by H. Moissan (*Comptes Rend.*, Vol. CXX, p. 290). He has obtained blue titanium protoxide, titanium nitride (Ti_2N_2), crystalline titanium carbide (TiC), and metallic titanium, by heating a mixture of titanic acid and carbon in the electric furnace. Titanium itself is the most refractory substance yet obtained by this means, being more infusible even than vanadium, and much more so than chromium, tungsten, molybdenum, and zirconium. It requires the most intense heat capable of production, and even then contains at least 2 per cent. of carbon. It forms friable masses, having a bright white fracture. It is harder than quartz or steel. Its specific gravity is 4.870. Its chemical properties as a whole resemble those of silicon.—*Merck's Report.*

METRIC SYSTEM OF WEIGHTS AND MEASURES.

BY EDWARD L. MILHAU, PH. G.

Some amendments are requisite to render the metric system more acceptable to the general public, including the illiterate, and to adapt it to the people's wants and customs.

First—The system should be presented simply as having been unanimously adopted at an international convention of scientists held in Paris at the close of last century. It has since been legalized by nearly all governments, including Japan and the 28 treaty ports of China, and all are provided with exact copies of the standards in Paris. It has not yet been made compulsory, however, here, in Great Britain or Russia, but it no doubt will be in time.

Second—The polyglot titles should be dropped and their respective initials substituted. Thus the capital letters K, L, M, A, S would serve as indeclinable symbols—precisely like the symbol $.

The fractions or hundredths to be designated by a small c, in the same way that cents are now designated by cts.

Third—The unit for commercial weights should be K, as harmonizing with its fluid equivalent L. This plan has already been adopted by the government of British India.

Fourth—The notation should conform exactly to that of our currency: that is, rather centisimal than otherwise: and the units and hundredths should be designated by an upright line, on bills and invoices, as $ and cts. are. This is shown in the appended example:

					$			
K	2	50	Cheese	@		40	1	00
L	10	00	Kerosene			25	2	50
M	4	25	Silk		2	00	9	00
A	1	25	Oilcloth			50		62½
S	1	00	Broken stone		4	50	4	50
Kilom	1	00	Fences	per M		40	400	00
T	2	00	Coal		5	40	10	00

These symbols would be intelligible wherever the metric system is known. They are preferable to such local names as fass, loth, pinta, stein, stoma, &c., adopted by various countries to facilitate the change from their respective old systems into the metric. It is a noteworthy fact that the most ignorant and illiterate compute their wages and make change with ease in our currency. That is the fundamental principle on which this plan of symbols and notation is constructed.

The recollection of the symbols is aided by the association of ideas Thus: K, the first on the list, is the key; M stands for measure: L for liquids; A for area; S for solids; Kilom for long measure (⅔ mile), and contains all three consonants: K, L, M. T for ton or thousand K; H A for hundred A (2½ acres)

The foregoing comprise all that are in any way requisite. Being pronounced kay, el, em, &c., they possess the brevity of the present titles: ounce, pound, quart, gallon, foot and yard.

No mention need be made here of the denominations used by professional men as they have already adopted the abbreviations G, mg, cc, mm, though they omitted to contrive similar conveniences for the transaction of ordinary business.

The necessity for a universal standard grows more urgent daily. While we still adhere to the old (or Winchester) pint, quart and gallon, a different system, called the Imperial, has been adopted in Great Britain, so that those titles are misleading. They have made similar indefensible changes in the old standard apothecaries' weights and fluid measures. Moreover, when the department at Washington lately sent to London to have its yard measure compared with the standard there, to define the discrepancy known to exist, it was found that the said standard, and the only one, was broken and worthless. So there is no yard measure now. British writers have characterized this state of affairs as "intolerable."

The metric system being legalized, in fact being the only one legalized in the United States, the question arises whether the government should not proceed and establish it, with appropriate symbols.

It might be well to require that after some date sufficiently remote in all business between it and citizens, as in contracts, duties, taxes, &c., the metric system should be used: and that it should cease compelling importers translating their invoices into the present non-legalized system. A set of standards might be placed with each postmaster—allowing him to collect small fees for their use, under certain regulations.

Unreasonable people will complain of the expense entailed by a change. Beam scales and balances will not have to be altered, but the dials on spring scales will Platform scales and steelyards will have to have sliding K weights, instead of lbs.

The subdivisions will of course show ¼s and ⅛s of K, but that offers no impediment more than the present ¼s and ⅛s of lb.

These suggestions, by eliciting discussion, may help diffuse a better knowledge of the universal system and hasten its advent, and, though so trifling, they bear something of the same relation to the system that a lubricant does to a machine.

At the gardens of the Royal Botanic Society, on June 7th, Dr. D. Morris delivered the first of two lectures upon the Romance of Plant Life, with lime-light illustrations. The lecturer discussed some of the most striking features of the vegetation of the Canary Islands. Chief amongst those were the singular dragon trees, which were closely related to trees distributed over widely-separated parts of Africa. They were regarded as the survivals of a very old African flora, which once flourished on that Continent at a time when the climate was much colder than at present. It was suggested by Balfour and others that, as the ice in the Ice age gradually receded northward and the climate got warmer, these plants were driven to higher regions, and hence on the high peaks of Central and South Africa, the Canary Islands, the slopes of Ruwenzori, and the mountains of Abyssinia, the remains were found at the present day of an old African flora, which, by climatic changes, had been gradually driven out and replaced by more tropical plants. The study of these and similar plants afforded one of the most interesting problems in botanical science. The lecturer concluded by discussing the Canary native palm, which incidentally led up to an interesting account of curiosities occurring in palm life.—*Brit. and Col. Dr.*

ABSTRACTS AND NOTES ON NEW REMEDIES.

BY VIRGIL COBLENTZ, A. M., PH. G., PH. D.

Kreosal.—Messrs. Balland and Dubois have applied this title to a preparation prepared from tannin and creosote. To a mixture of equal parts of tannin and creosote heated to 80° C. phosphorus oxychloride is added, the heating being continued until the generation of gas ceases. The mass is then poured into cold diluted sodium hydrate solution, whereby kreosal separates, the precipitate is then well washed and dried on a water bath. Kreosal forms a very hygroscopic, dark-brown powder which is readily soluble in water, alcohol, glycerin and acetone, but insoluble in ether. It is employed either as a dusting powder or in solution in treatment of inflammations of the air passages.

Lysolum Bohemicum. — A tar preparation made by Brdlik in Kralup (Bohemia). It forms a dark-brown liquid of agreeable odor, which mixes with water in all proportions forming a yellowish colored solution. As a 1 or 2 per cent. solution it is employed for disinfecting wounds; for disinfecting instruments a 0.2 per cent. solution is sufficient.

Aluminium Potassium Salicylate.—Prepared according to Athenstædt by the action of potassium acetate on aluminium salicylate. Recommended as an astringent and antiseptic.

Anaesthyl.—According to Bengué consists of a mixture of Aethylchlorid, 5 parts, and Methylchloride, 1 part. It is recommended as a local anæsthetic.

Iodogen.—A mixture of charcoal and potassium iodate (KIO_3), moulded in the form of candles, which when ignited emit vapors of iodine, serving thereby as a disinfectant.

Detection of Cane in Milk Sugar.—Conrady (*Jour. de Pharm*, '95–101) recommends Resorcin as a reagent, whereby 0.1 per cent. may be detected. One gramme of the sample of milk sugar is dissolved in 10 C.c. of water, adding 0.1 Gm. resorcin and 1 C.c. of concentrated hydrochloric acid, then boiling five minutes. If traces of cane sugar are present the liquid will be colored red.

Salicylic Methyl Ester in Java Coca Leaves.—M. P. Rombergh has found in the fresh coca leaves cultivated in Java, from 0.06 to 0.02 per cent. of methylsalicylate. Leaves of other species of erythroxylon as E. bolivianum contained 0.004 per cent. of the ester, while the E. ecarinatum contained traces of salicylic acid.—*Chem. Ztg*, No. 11-'95.

Iodine Tincture.—Popiel (Ph. Ztsch. f. Russl.), after numerous experiments has shown that the preservation of tincture of iodine in the dark or in amber bottles is entirely unnecessary, as the products of decomposition (hydriodic acid, iodoform, iodethyl), caused by the action of light, again suffer decomposition with the separation of free iodine. The use of impure alcohol, particularly such as contains fusel oil, causes rapid decomposition with the formation of iodine substitution products.

Alpha Guaiacol.—A sympathetic, crystalized guaiacol prepared by Frère, Champigny & Cie., of Paris.

Ferrol.—According to Chemist and Druggist it is a purified petroleum extract, recommended by the Ferrol Company as a substitute for cod liver oil.

New Morphine Reaction.—Bruylant (*Annal. de Phar., 1895,*) recommends that a sample of morphine or its salts be warmed with a few drops of pure sulphuric acid on a water bath, then adding a drop of Froehde-Buckingham's Reagent (0.01 Gm. Ammonium molybdate to 1 Cc. H_2SO_4) whereby a bright green color is produced; this remains unchanged for some time. This reagent possesses the advantage that several reactions may be carried on different conditions. For example: the morphine is dissolved in two drops of concentrated sulphuric acid on a watch glass, than by means of a glass rod a trace of the solution is removed and stirred with a few drops of Froehde's Reagent on a porcelain surface, whereby the well known purple color reaction is produced. The sulphuric acid solution contained in the watch glass is warmed on a water bath and a fresh portion of Froehde's solution added, whereby a green color is produced. To this green colored solution a few grains of saltpetre are added, and after stirring, a red color results, which after a time changes to a yellow. The following table shows the various color reactions produced by the different opium alkaloids with the above reagents:

Alpha Creosote.—A product prepared by mixing the various constituents, such as occur in normal creosote, in such proportions that it contains 25 per cent. of crystalized guaiacol.

Anti-Bacillare.—A mixture containing creosote, tolu-balsam, glycerin, codein and sodium arsenate, recommended as a remedy against phthisis.

Antistreptococcin.—A serum preparation; an antitoxin against erysipelas, prepared by Dr. Marmorek, of the Pasteur Institute, Paris. Obtained from the cultures of the erysipelas bacillus (streptokokken).

Chinolinrhodanid.—A new antiseptic, which possesses the antiseptic properties of both mercuric chloride and carbolic acid, being at the same time entirely free from any toxic effect. A 0.3 per cent. solution destroys the cholera bacillus in one minute, while during the same time the diphtheria bacillus is destroyed by a 0.9 per cent. solution. In treatment of gonorrhoea a 1 per cent. solution produced effective results.

Diacetanilid.—Prepared by heating phenyl mustard oil with acetic acid, or by heating acetanilid with glacial acetic acid at a temperature of 200 to 250° C. In medicinal effect it is more powerful than acetanilid.

Gallicin.—The methylether of gallic acid, introduced by Messrs. Sandy & Co., of Basel. Prepared by heating a solution of gallic or tannic acid in methyl alcohol with sulphuric acid. Its constitution $[C_6H_2COOCH_3(OH)_3]$ reminds one of Resorcin and Pyrogallol; it is, however, non-toxic.

Copperhaemol.—A compound of haemoglobin and copper ($C_{648}H_{1030}N_{178}FeCu_5S_2O_{177}$) prepared by E. Merck. It is entirely absorbed by the intestines without producing any disturbances. Dose, 0.5 Gm.

Laifan.—A crude borneol, probably identical with the Ngaïcamphor of the Blumea balsamifera. It forms a thick paste, which is employed by the Chinese as an outward application for the relief of headache.

Alkaloids.	I. *Froehde's Reagent with H_4SO_4 in cold.*	II. *Froehde's Reagent with H_2SO_4 after warming.*	III. *Same as II, adding a few grains of KNO_3.*
Morphine	Purple	Green	Green, passing into red, which fades.
Apomorphine	Greenish blue	Green	Violet passes into red.
Codeine	Dirty green, then blue	Green	Same as morphine.
Narceine	Blue passing into green	Dirty Green	Same as morphine.
Narcotin	Green, then green-brown	Green	Violet followed by red.
Papaverin	Green followed by blue and red	Same as I	Green color disappears.
Uleconin	Evanescent green	Dirty blue	Green color disappears.
Cryptopin	Dirty green then greenish-brown	Dark green	Green color disappears.

Menthol-Salol-Lanolin.—A remedy for chapped hands recommended by the Pharm. Post, consisting of menthol 1 part, salol 2 parts, olive oil and lanolin each 15 parts.

Nosophen.—An iodine substitution product of phenolphtaleïn of the formula $(C_6H_2I_2OH)_2C.O.C.H_4CO$, a tetraiodphenolphtaleïn. Obtained by the action of iodine on a solution of phenolphtaleïn. It forms a pale yellow, inodorous and tasteless powder, insoluble in water, with difficulty in alcohol, readily soluble in ether and chloroform. Nosophen unites with alkali bases, forming soluble salts; with the heavy metals it forms insoluble salts. It is recommended as an antiseptic dusting powder.

Para acet-amido phenol - ethyl - carbonate.—A powerful antipyretic, analgetic and hypnotic, given in doses of 0.5 Gm. in treatment of neuralgic pains. It forms a tasteless, colorless crystalline powder, which is insoluble in water, but readily so in alcohol.

Phenolsulphonate of Calcium.—An antiseptic disinfectant and astringent powder, obtained by interaction between calcium carbonate and phenolsulphonic acid. Readily soluble in water and alcohol. Taken internally in 1 per cent. solution.

Phosphor Chocolate.—A weighed quantity of phosphorus is dissolved in the necessary amount of fused cocoa-butter, filtered and by the addition of sugar and aromatic powders made into pastilles of the desired size.—Phar. Ztg. '95, No. 28.

Salithymol.—A compound of salicylic acid and thymol, obtained by the action of phosphorus trichloride on a mixture of sodium salicylate and sodium thymolate at 120°-130° C. Salithymol forms a white crystalline powder of sweet taste and is recommended as an antiseptic.

NOTES HERE AND THERE.

The New York Botanical Garden.—Several important meetings in relation to the work of the New York Botanical Garden have recently been held, and the inauguration of this great institution is very close at hand. The procuring of the necessary legislation, the completion of the organization, and the securing of the necessary subscriptions, in the midst of the great financial depression which has recently prevailed, have proven heavy tasks and have rendered it necessary that haste should be made slowly. All these results have now been practically accomplished, and the managers have recently been engaged with the Park Commissioners and their officials in selecting the grounds and studying plans for their allottment and for the arrangement of the necessary buildings.

The season is now so far advanced that anxious New Yorkers will have reason to fear that no considerable amount of planting can be done this season, but they may expect that within twelve months from date the garden will be actually open to the public.

Gutta-Percha from Leaves.—There is now a prospect that the supply of gutta-percha will become permanent. The old native method of cutting down a tree to get the gum, and thus killing the goose that laid the golden eggs, is giving place to that of plucking the leaves and extracting the gum from them. This plan has been put in practice by M. Hourant at Sarawak with success. The gum from the leaves is not only purer, but there is more of it. An adult tree of 25 to 30 years' growth only yields growth only yields one caddy of gum when the tree is sacrificed, whereas two pluckings of the leaf yield as much without injuring the tree. Moreover, the saplings from the roots of trees already cut down are useful in yielding leaves.—*Chem. Trade Journal.*

The Medical Profession in Belgium.—The total number of qualified medical practitioners in Belgium is 2,950. Of these 384 dispense their own medicines. The proportion of doctors to population is 1 in 2,122. The number of practitioners in Brussels is 558, being in the proportion of 1 to 1,370 inhabitants. The proportion at Liége is 1 to 1,771; at Ghent, 1 to 2,186, and at Antwerp, 1 to 2,251. There are in Belgium 2,372 midwives, or 1 to every 2,640 of population.—*Brit. Col. Drug.*

The Colocynth Plant.—The colocynth, or bitter apple, grows abundantly on the maratime plain that lies between the mountains of Palestine and the Mediterranean. It is found from below the City of Gaza on the south to the base of Mount Carmel on the north. The dwellers along this plain pay little attention to the plant, and spend neither time nor labor in its cultivation. It grows without cultivation, the soil and climatic conditions producing it without the help of the husbandman. With some attention the plant would undoubtedly bear a larger and richer fruit—richer in that pulp which makes the colocynth valuable. But there is no object in thus improving the plant and its yield, as nature alone now supplies far more than the natives can find a market for.

The soil of this maratime plain is a light-brown loam, very rich, and almost without a stone. In places where the loam has been mixed with sand, the colocynth plant seems to thrive best. Very little rain falls on parts of this plain. The plant does not suffer from this lack of moisture. The climate is warm the year round, and during the summer months the heat is intense, so that the conditions necessary for the successful raising of the colocynth would seem to be a good soil, somewhat sandy, a warm climate and a little moisture.

The plant itself resembles our common cucumber, but its fruit is globose, about the size of an orange, of a light brown color. Its rind is smooth, thin and parchment like. It is known as the Turkish colocynth, and is superior to the Spanish and Mogador varieties, in the amount of pulp its fruit contains. The pulp constitutes 25 per cent. of the fruit. The rind and seeds are valueless.

The fellaheen, or peasants, gather the fruit in July and August before it is quite ripe. It is sold to Jaffa dealers who peel it and dry the pulp in the sun. It is then moulded into irregular small balls, packed in boxes, and shipped, mostly to England. The average annual shipment from Jaffa is 10,000 pounds, though this year's shipment amounted to only about 6,000 pounds. This quantity could be increased indefinitely, if there were more demand for it, and a price were paid that would make it an inducement for the peasants to gather and prepare it. The price now paid for the colocynth pulp, prepared, packed for shipment and delivered on board the steamers in the port of Jaffa is about 30 cents a pound.

There seems to be no reason why the plant should not be successfully grown in certain parts of the United States. The soil and climatic conditions are certainly adapted to it.—*United States Consular Report.*

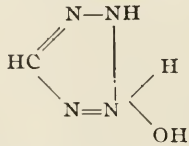
A prescription appeared in the *Medical Gleaner*, written by Dr. W. C. Cooper, the constituents of which were as follows:

℞. Tetrahydrobetanaphtholamine,
Sodium Thioparatoluidinesulphonate,
Orthosulphamidobenzoic anhidride,
Amidoacetoparaphenetidine aa ʒi.
M. Sig.: A tablespoonful every hour.

This was prescribed for a disease which the doctor calls—Typhomalariopneumophthisicotrychinotetanoataxionephriticosplenitis.—*Phar. Jour. of Australasia.*

A NEW SERIES OF NITROGEN COMPOUNDS.

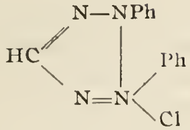
Another new series of nitrogen compounds, containing four atoms of that element along with one atom of carbon in a closed chain, are described by Prof. v. Pechmann and Herr Runge in the Berichte. They are termed "*tetrazolium*" compounds, and the parent base of the series is tetrazolium hydroxide, whose constitution is represented by the formula



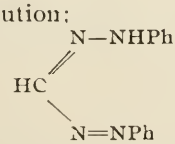
The fundamental base itself has not yet been isolated; the compounds prepared comprise the derivative in which the two hydrogen atoms directly attached to the two end nitrogen atoms are replaced by phenyl, together with a large number of salts of this base, formed by replacement of the hydroxyl by halogens or other acid radicals, just as in the case of metallic hydroxides. The hydrogen atom attached to the carbon is likewise capable of replacement by many organic radicals, so that a large number of still more complicated bases have likewise been prepared, together with their corresponding salts.

The hydroxides of this new series are characterized by possessing strong basic properties. They may all be prepared most conveniently from their chlorides, by the action upon them of silver oxide. They are extremely soluble in water, but are completely precipitated from their solutions, by ether. The aqueous solutions absorb carbon dioxide and behave very much like caustic alkalies. They cannot, however, be crystallized, forming resins upon concetration.

The salts, on the other hand, crystallize admirably; they are usually soluble in water, react neutral to litmus, and possess a very bitter taste. Diphenyl tetrazolium chloride,



which may be taken as a typical salt of the series, crystallizes in colorless radiating groups of needles very sensitive to light, which renders them yellow. The aqueous solution yields a flesh-colored precipitate of chloroplatinate with platinum chloride, and the double salt may be crystallized from hot water. A crystalline double chloride is likewise produced with gold chloride. The addition of a soluble nitrate or iodide causes the precipitation of the difficulty soluble nitrate or iodide of the base. A solution of iodine in potassium iodide precipitates an iodine addition product, which can be crystallized from alcohol in beautiful brown tabular crystals exhibiting a violet reflection. The parent base is produced in solution upon the addition of silver oxide, silver chloride being likewise formed. The chloride is reduced by ammonium sulphide to a compound of the constitution:



a substance which Prof. v. Pechmann has previously described, and which is interesting as forming the starting point for the preparation of the new series. For the chloride may at once be prepared from this latter substance by oxidation with amyl nitrite and hydrochloric acid. The substance is readily prepared by the action of diazobenzene chloride upon malonic acid, constituting the insoluble product of the reaction. It is of considerable interest to observe that the main product of the dry distilation of diphenyl tetrazolium chloride is azobenzene.—*Nature.*

Photographic Notes.—Infinitely Rapid Motions and Photography.—On Saturday, March 9, at the Royal Institution, Lord Rayleigh, in lecturing upon the multitudinous motions of the waves of the sea, and the forces which govern them in their phases, as revealed by the researches of Stokes, Thomson, himself, and others, spoke of waves upon the surface of water too small and rapid to be seen by the eye. These, he explained, can only be made visible, and apparently slowed down so as to be appreciated, by means of instantaneous photography, or by a series of instantaneous optical projections Each flash of light, such as that of the electric spark, makes the object appear to stand still for a moment in one of its phases, and the flashes must be so timed as to reveal each phase so that they blend slowly, and the whole appears to be moving so slowly that the nature of the motion can be seen. He projected an enlarged image of a vibrating tuning fork upon the screen, and its prongs appeared fuzzy from the rapidity of the motion, but when the projection was performed by properly timed flashes of light, he so slowed down the apparent motion, that each prong appeared to make but one vibration in about two seconds, so that the nature of its motion could be seen with ease. He then projected upon the screen the photographs he took three years ago of bursting soap films, each taken by the light of an electric flash lasting less than one-millionth of a second. The soap films were broken by means of letting a bullet, wetted with alcohol, fall through them; a dry bullet would go clean through them, perhaps, a dozen times without breaking them. The greatest difficulty in the work was in the mechanical arrangements, to so time the flash that it should occur just as the bullet had passed through the film. The photographs were good ones, showing the falling bullet, and the torn and thickened edges of the broken film, as well as some little attached filaments of liquid beads of soap solution.—*Photography.*

Tests for Trional.—Pure trional forms colorless, odorless crystals in thin lamellae, soluble in 300 parts of cold water, easily soluble in ether and alcohol, and melting at 76.5°C. Mixed with charcoal and heated carefully, it gives off the odor of mercaptan. The aqueous solution should give no odor on boiling. After cooling and filtering, it should give no turbidity with barium nitrate, or silver nitrate. It should not decolorize solution of potassium permanganate. —*Pharm. Post.*

THE REFORM OF WEIGHTS AND MEASURES IN ENGLAND.

The Report of the select Committee appointed to inquire whether any, and what, changes in the present system of weights and measures should be adopted, has been published as a Parliamentary paper.

Evidence from witnesses representing official, commercial, manufacturing, trade, educational and professional interests was received by the committee, and numerous corporations, school boards, and other public bodies sent resolutions in favor of the adoption of the metrical system.

All the witnesses expressed a strong opinion as to the complicated and unsatisfactory condition of the present weights and measures in use, and of the distinct and serious drawback to British commerce, especially in the foreign trade, which this system entails, differing as it does from the system (metrical) now adopted by almost every European nation, as well as by far the majority of non-European countries with which this kingdom trades. The evidence also showed that the home trade would be benefited if more simple and uniform standards of weights and measures than those now existing were adopted.

Moreover, strong evidence was brought forward as to the serious loss of time incurred by English school children in having to learn the complicated system of tables of existing weights and measures, and the urgent need of the adoption of a simpler system. It was stated that no less than one year's school time would be saved if the metrical system were taught in place of that now in use.

Evidence from competent witnesses proved to the satisfaction of the committee that a compulsory change from an old and complicated system to the metrical had taken place in Germany, Norway and Sweden, Switzerland, Italy, and many other European countries without serious opposition or inconvenience; that this change was carried out in a comparatively short period; and that as soon as the simple character of the new system was understood it was appreciated by all classes of the population, and no attempt to use the old units or to return to the old system was made.

In the United States, where a system founded on the English units exists, a commission is at present engaged in an investigation of the same character as that with which the committee was charged, and the Federal Government has this year passed an act rendering the metrical system compulsory for pharmaceutical purposes.

The committee believes that the adoption of the metrical system by England would greatly tend to render that system universal.

It is recommended:

(*a*) That the metrical system of weights and measures be at once legalized for all purposes.

(*b*) That after a lapse of two years the metrical system be rendered compulsory by Act of Parliament.

(*c*) That the metrical system of weights and measures be taught in all public elementary schools as a necessary and integral part of arithmetic, and that decimals be introduced at an earlier period of the school curriculum than is the case at present.—*Nature.*

Barium Pyrogallate.—R. Godeffroy (Oesterr. Zeitschr.) describes a pyrogallate of barium, obtained in fine acicular crystals, by mixing an aqueous solution of pyrogallic acid with excess of solution of barium hydrate. The composition appeared to correspond to the ormu a, $C_6H_4BaO_3, 4H_2O$.

A COLLEGE OF PHARMACY BUILDING IN SAN FRANCISCO.

Our friends upon the Pacific coast are to be congratulated upon their success in converting their relations as a department of the State University into something more tangible than that which obtains on this side of the continent. Like us, they have for a long time been associated with the State institution in name only, the net outcome of the relation, so far as the public good was concerned, consisting in a presentation to the Regents of an annual report of progress, which, of course, would have been published with equal promptitude and usefulness if the State University had not existed. In other words, the "State University" under such conditions is practically a myth. During the past year, however, the State University of California has succeed in obtaining from the State an appropriation of some three-quarters of a million, to be applied to the purposes of the departments of law, medicine, pharmacy, and, if we recollect rightly, veterinary science. In addition to this large sum of money to be devoted to building purposes, it is understood that the site for the buildings is to be obtained through donations. An entire block is to be devoted to this purpose.

It is, of course, in the pharmaceutical department that we are more especially interested. With admirable wisdom the promoters of the enterprise determined to secure the very best data obtainable before proceeding to execute the task imposed upon them, and a commission was appointed, representing all the four departments interested, for the purpose of visiting similar institutions throughout the country. Upon the 25th inst, this commission visited our college and devoted several hours to a minute examination of the building, both from an architectural and an educational standpoint, and carefully investigated at the same time the methods of instruction here employed. As the college received notice of the intended visit no earlier than the preceding Saturday afternoon, it resulted that we could not show to our visitors the attention that we desired. Nevertheless they were conducted through the building by several members of the faculty as well as by the clerk and by Mr. Mason. We understand that they expressed themselves as highly pleased both with the institution and with the methods of instruction, which they regarded as being the most complete and practical which had been anywhere observed.

NATURE OF THE VESICATING CONSTITUENT OF CROTON OIL.*

The vesicating constituent, or more strictly, the postule-producing constituent of croton oil, has been the subject of investigation by numerous chemists and pharmacologists during the past forty years. According to the researches of Bucheim, and more recently of Kobert and Hirschheydt, the vesicating action is due to an acid closely allied to oleic acid, which has been given the name of crotonoleic acid. This substance is now prepared on a large scale in Germany for medical use, being extracted from croton oil by the method devised by Kobert and Hirschheydt. This consists in saponifying with barium hydroxide that part of croton oil which readily dissolves in strong alcohol. The resulting barium salts are washed with water, then dried and repeatedly extracted with ether, which dissolves the barium salts of oelic and crotonoleic acids. These salts are separated by means of ether, which dissolves only the barium crotonoleate, and this, when decomposed with dilute sulphuric acid and extracted with ether, furnishes the crotonoleic acid as a viscid oil.

Since very little is known about this acid, even its composition, being undetermined, the authors prepared it with the object of studying its properties, and, if possible, of determining the constitution, since no fatty acid of known constitution exhibits the property of vesicating. Starting with the crotonoleic acid, prepared as described above, the lead salt was obtained and submitted to a process of fractional precipitation by adding successive quantities of water to its solution in alcohol. By this means crotonoleic acid was proved to be a mixture composed for the most part of inactive oily acids, the lead salts of which are precipitated first, while the true vesicating constitutent (or its lead salt) is principally contained in the last fractions, and represents but a small proportion of the original material. It was observed that the conversion of the crotonoleic acid into a lead salt did appreciably affect its vesicating power.

The supposed active constituent of croton oil, crotonoleic acid, having thus been shown to be a mixture, the authors proceeded to attempt to isolate the vesicating constituent from croton oil direct.

By saponifying that part of the croton oil which is soluble in strong alcohol with a mixture of lead oxide and water, and repeatedly fractionating an alcoholic solution of the lead salts with water, the later fractions, which possessed the greatest vesicating power, ultimately furnished when submitted to a series of fractionations, a resinous substance having extraordinary power as a vesicant. This substance could not be further resolved by repeating the process of fractional precipitation of the alcoholic solution with water. The same substance was isolated from the so-called "crotonoleic acid," and the authors propose to name it "croton-resin." To its presence the vesicating property of croton oil is due. The composition of croton-resin is expressed by the empirical formula $C_{13} H_{18} O_2$. So far all attempts to crystallize it, or to obtain crystalline derivatives from it, have been unsuccessful. It is a hard, pale yellow, brittle resin, nearly insoluble in water, light petroleum, and benzine, but readily dissolved by alcohol, ether and chloroform. When heated it gradually softens, and is quite fluid at 90° C. Croton-resin has neither basic nor acidic properties; it may be boiled with a mixture of lead oxide and water without being appreciably affected. Ebullition with aqueous potash or soda gradually decomposes it, destroying its vesicating power. The products of this action are several acids, some of which are members of the acetic series. By oxidation of the resin with nitric acid a mixture of acids is obtained. The constitution of croton-resin is, therefore, complicated, and its molecular formula would appear to be at least $(C_{13}H_{18}O_4)_2$ or $C_{26}H_{36}O_8$. Since it is not saponified by a mixture of lead oxide and water, and as no glycerol could be detected among the products of its decomposition by alkalies, it is not a glyceride, and as it does react with hydroxylamine or phenylhydrazine, or sodium bisulphate it is probably neither a ketone nor an aldehyde. The evidence so far obtained points to the conclusion that the constitution of the vesicating constituent of croton oil may be that of a lactone or anhydride of complicated structure.

* Abstract of a communication to the Royal Society. By Wyndham R. Dunstan, M. A., F. R. S., Sec. C. S., and Miss L. E. Boole, F. I. C., Lecturer on Chemistry in the London School of Medicine for Women. Reprinted from Chem. and Drug.—*Pharm. Era.*

CLEVEITE AND HELIUM.

Resting peacefully on the broad bosom of the Norwegian hills there lies the mineral cleveite. It looks so uninteresting, so utterly ordinary, that the Paleolithic Norwegian would probably have considered it too unspeakably common to use for cracking open either his oysters or the skull of his enemy, while the fighting Viking would very properly have hesitated to accept it as ballast for his war ship.

Well, the Paleolithic gentlemen and the Vikings have been gathered in with others of the "real old school." Peace be to them; they were men! But we, who now walk about the earth, have adopted a different standard of interest; and cleveite, common-looking stone as it is, has carried down to us, through the years, not only the "thoughts that do lie too deep for tears," of Wordsworth's flower, but the radiant hope of a widening knowledge which will not only increase the material comforts of our civilization, but will solve some of the most exasperatingly elusive puzzles that the poor chemist and physicist have to deal withal.

Cleveite was investigated first by Cleve of Upsala, and is a variety of uraninite. It is made up chiefly of the compounds of uranium (uranyl uranate and uranate of lead), a somewhat rare metal about eighteen times as heavy as water, having the appearance of nickel. Together with these compounds of uranium there were discovered small quantities of rare earths which, although not of economic importance, are some hundreds of times more valuable than gold.

Now, unfortunately, our cleveite, though noteworthy as a source of these elements, did not add to our knowledge, for we knew uranium and the rare metals ; and it therefore remained for some years classed with other rare minerals whose names are a " terror by day " to the unfortunate mineralogist who finds it necessary to memorize them. During the month of March, however, Professor Ramsay, whose name is inseparably connected with the epoch-making discovery of atmospheric argon, was led to seek some clew by which he could hope to make his argon combine with some other element. His attention was drawn to a paper by Hillebrand in the United States Geological Survey (No. 78, page 43) "On the Occurrence of Nitrogen in Uraninite." According to Hillebrand, the gas nitrogen was obtained by simply boiling the mineral in dilute sulphuric acid. Now this is a very astonishing thing, for throughout the whole realm of nature we know no mineral which gives off nitrogen on being boiled with sulphuric acid, and Professor Ramsay was entirely skeptical as to its possibility.

In the hope that the gas was in reality argon, and with the idea of so striving to make argon combine with uranium, he investigated the matter himself, and found his incredulity justified; for the gas he obtained in his receiver contained no nitrogen whatever, but was a new gas, which he was utterly unable to identify with any known terrestrial substance. Now, new elements do not hang on every bush in the days when keen-eyed science searches through every nook and cranny of creation; and so its discovery, even though there was nothing more, was a very wonderful thing.

We have said the new gas could be identified with no known terrestrial element; but it was identified, and that very quickly, with the mysterious element in the outer layer of the sun's atmosphere called helium. Before considering the remarkable consequences of the discovery, let us ask how Ramsay could know that the colorless gas which he held in his test tube was identical with a substance 93,000,000 of miles away, which no man had ever seen. Briefly, it was by the light which it had emitted on being heated to incandescence. That different substances on being heated give out lights of different colors, may be seen in every display of fireworks; that every known substance, on being heated to an incandescent condition, gives out a light peculiarly and characteristically its own, is a broader statement, but just as true. The light may not look characteristic to the unaided eye; but when it passes through the triangular prisms of a spectroscope, the original ray is dispersed into a broad band, or spectrum, whose vari-colored lines declare in an unyielding voice the nature of its constituents. Moreover, the spectroscope's decisions cannot be invalidated by distance. Its jurisdiction extends to the walls of the universe.

In 1868 J. Norman Lockyer, by means of this most remarkable of all instruments of precision, discovered certain lines in the solar spectrum which could only be accounted for on the hypothesis of a new element, which he named helium.

The most prominent of these lines was one marked D_3, close to the yellow line of sodium. The first thing which struck Ramsay in examining the gas from uraninite was the D_3 line of the solar spectrum. Amazed, and half doubting his own senses, he sent the tube to Professor Crookes, of London, the world-famed authority on the spectra of the elements, who fully confirmed Professor Ramsay's discovery. Since then helium has been prepared by Lockyer, Cleve, of Upsala, and others; and its existence can no longer be doubted. The gas, however, obtained from cleveite is not pure helium, but contains other elemental gases hitherto unknown, whose investigation and separation will tax all the powers of chemical ingenuity. The presence of these other curious gases, the simplicity of the helium spectrum, the obstinate pertinacity with which it refuses to be classed with any of the "happy families" into which the other elements have arranged themselves, together with the enormous quantities in which it exists in the hottest part of the sun's atmosphere, lead us to think that we are on the "ragged edge" of solving that burning question of physico-chemical science, the genesis of the elements themselves. It is very probable that the atoms of our so-called elements are but different combinations and aggregations of the atoms of one primordial element; and it is possible indeed that this primordial element is helium or one of the strange elements associated with it.

The late Professor Huxley says that the "idea that atoms are absolutely ungenerable and immutable 'manufactured articles' stands on the same sort of foundation as the idea that biological species are 'manufactured articles' stood thirty years ago;" and Professor Richter, of Breslau, stated in 1891 that the various properties of the elementary atoms may be explained by the supposition of yet simpler primordial substances." These "simpler primordial substances" have very probably come upon the stage with helium within the last three months.

Hail to them! We may now realize the dream of the alchemist—the transmutation of metals. But outside of these considerations there are others of a somewhat different nature. The gas nitrogen, so lazy and inert that it is useful in the atmosphere merely as a diluent, when in combination with other elements, gives us our most valued medicines, poisons, explosives, and industrial products. Its useful compounds may be numbered by the thousand. The gas helium holds out the same promise. When made to combine with other elements, we may look for compounds having properties a conception of which we have as yet not the shadow of a dream.—*Scientific American.*

Upas Tree.—Prof. Wiesner, during his recent stay in Java, ascertained some interesting particulars with reference to the celebrated Upas tree, Antiaris toxicaria. Contrary to the general impression that this tree is not uncommon in Java and Sunda Islands, he learned (*Pharm. Jour.*, LIV., p. 1094), that the original specimen described by Leschenhault has been felled, and in the whole of Java there were only three individual trees belonging to the genus Antiaris and closely allied to A. toxicaria. Of these three trees one was found by Dr. Greshoff to be innocuous, and was, therefore, A. innoxia Blume, a species supposed by many botanists to be only a variety of A. toxicaria. The second tree proved to be poisonous, one drop of the latex being sufficient to kill a dog; the third has not been examined. The tree has, however, been cultivated in the botanical garden, and there are now in the plantation at Tjikomoh about seventy specimens. Neither in the botanical garden nor in the plantation could any ill effects be observed even after having been for some time in the neighborhood of the trees, and the accounts of the poisonous nature of the exhalations from it are much overstated. Dr. Burck has shown that the plants give off no injurious vapors, and the latex is poisonous only when it passes through a wound into the blood. Material brought from Java by Prof. Tichomirow has been examined by Gorodetzky. The bundles in Antiaris toxicaria are bicollateral; the laticiferous cells which do not anastomose with one another contain a granular, light brown, strongly refractive matter. The juice contains a glucoside antiarin, the best reaction of which was found to be the change of color from yellow to orange-red on boiling a solution with sodium picrate.—*Merck's Report.*

Alumni Notes.

SUMMER OUTING.

The annual outing of the Alumni Association held at Sound View, City Island, on June 26th, was as usual one of the brightest days in the Alumni year. The life of the average druggist and druggist's assistant is too confining to allow any such days of recreation and reunion to pass unheeded; yet, many permit themselves to become so wedded to the shop and its routine duties that even the prospect of a pleasant afternoon spent with old friends amid enjoyable surroundings is not sufficient attraction to call them away, but those who do go return home refreshed in mind and body and better qualified to pick up the thread of life's duties where it was temporarily laid down. The attendance this year was larger than it has been for some years previous. Much credit is due the Committee for the manner in which they performed their duty. As each train arrived at Burton Station from New York, Mr. Davis was in waiting and had all the cars of the local street car company at his command. The ride from the cars through Pelham Bay Park to City Island was very pleasant, and at the place selected for holding the reunion, no pains had been spared to make the affair a pleasant one and the guests as comfortable as possible. The greater portion of the afternoon was taken up with boating and sailing, a good stiff breeze made the latter sport especially enjoyable and exciting. This was followed by dinner to which all did ample justice. The Committee had taken with them from the city a string band of four pieces which furnished excellent music; strains of popular melodies acting as peptinoids. After dinner was over, a short business meeting was held and about thirty applicants elected for membership. The floor was then cleared for dancing, which amusement was participated in by nearly all present until the time had arrived to commence the homeward journey and catch the last train for New York, all feeling that the afternoon had been well and pleasantly spent. The Committee were: Charles F. Keale, '89; Julius Tannenbaum, '93, and T. M. Davies, '94. Among those present were President Alfred Stover, Past President Herman Graeser and Messrs. Diehl, Voland, Oelinger, Jergersen, Breen, Russwig, Davies, Schaefer, Keale, Frölich, Harold, Wolf, Lohr, Munson, Ihmels, Tannenbaum, Burger, and Misses Mahegin and Mahoney of the Alumni Association, and many friends including Mr. and Miss Mason, Mr. Rogers, Mrs. and Master Keale, Mrs. and Miss Tannenbaum, Mrs. Mary Owens, M. D., and Miss Owens (B. C. P.), Dr. C. F. W. Horn, Mrs. C. Frölich, Mrs. C. F. Wolf, Miss Eben, Miss Luts, Miss Annie Speckmann, Miss Gussie Lindner, Mr. and Mrs. Ottendoffer, Mrs. Harold, Mr. Freedlander, Mr. and Mrs. Skeiller, Mr. and Miss Ullrich, John Gesser and L. W. Deyeller.

It has been proposed to hold a fall outing of the Association. If this is done, the attendance would undoubtedly be large and would help to pave the way for a series of social meetings during the winter.

'92 NOTES.

WANTED—A '92 man to contribute to this column. For further information apply to the Editor.

AMONG the graduates of the Yale Law School this year was Leo Davis, who was quite popular here during his College of Pharmacy course. Having been admitted to the Connecticut Bar he is now practicing in Norwalk, that State, with the firm of Hurlbert & Gregory.

FRED. BORGGERE, who has charge of the prescription department in J. N. Hegeman &

Co.'s Broadway and 30th st. store, is one of the most popular pharmacists on upper Broadway, though quite modest in his ways. Fred will be found ever eager to confer favors upon his many friends *pro re nate*. At present he is spending two weeks' vacation in the Catskills, which is his favorite summer resort.

WAHOO.

'93 NOTES.

WHEN I nominated and elected myself reporter for the class I did not expect to be called upon to report anything of a sad nature. Yet at this early date I must report the death of a class mate, Otto C. Wells, of Corvallis, Oregon. I have been unable to learn any particulars of his death for want of his address.

Let us drop a silent tear over his premature death and extend our sympathies to his relatives and friends.

Rest in peace, Wells!

THE Annual Outing of the Alumni Association, held on Wednesday, June 26th, at City Island, proved quite a success.

The sail on Capts. Mulligan's and Rugiera's yachts were most enjoyable.

The afternoon was glorious, our spirits exalted, the music good, the dinner also good and the combination tended to send us home late, but well pleased.

Among them present were Mr. W. Munson, Miss B. Lutz, Mr. E. Lohr and Miss B. Eben, Mr. Ihmels, Mr. and Mrs. J. Tannenbaum, and Mr. B. Renswig, who deserves many thanks for journeying from Somerville, N. J., "to help swell the '93 ranks."

WILL MUNSON is engaged to Miss B. Lutz.

ALEX T.. KRAEMER was married on Wednesday, June 12, 1895. He is running his own shop at 51st st. and 10th ave.

WON'T you follow Zwingley's example and let me hear from you from time to time, boys?

Zwingley writes that he and the Mrs. are quite enthusiastic "bikers."

He also states that he is still alive, in spite of "Jersey Root Beer," and he ought to know.

ANOTHER man lately heard from is A. Lange, from Leavenworth, Kansas.

Lange is eager to learn something of the class and in order to do so became a subscriber. He is engaged to be married in the fall and will visit New York on his wedding trip.

DOC Chance, de peach, Tewiliger was discovered in Flatbush, L. I.

The honor of the discovery belongs to W. Munson.

I HEAR Huber, little fellow with beautiful sun burned whiskers, is married and runs a store in Brooklyn.

JULIUS TANNENBAUM, PH. G.,
116 E. 116th st., City.

'94 NOTES.

THE steadily growing increase in membership of the Alumni Association has caused considerable commend of late, not only among our graduates but the general trade. This fact has been noted in several of our leading journals, whose accounts could not fail but make every N. Y. C. P. reader feel proud, and with such a series of lectures as has been scheduled for this fall it is highly probable that we will make unprecedented strides.

OF all the reforms inaugurated by the present municipal administration, the one relating to the closing of soda fountains on Sunday has been of the most importance (to the pharmacists), the revenue derived from this source being an item of the utmost importance to the average pharmacist. He is naturally reluctant about complying with their request. Will this eventually lead to the addition of "side doors" to pharmacies?

RAINBOW is the name of one of the latest "soft drinks" served down town. Its composition is Spts. Frumenti and plain soda āā fingers iii and is capable of placing a man, who takes 3 doses in a fit condition to see things as through a prism, red, orange, yellow, green, blue, violet and indigo, more particularly indigo.

W. ARTHUR BASTEDO, who as a student and botanist is quite familiar to our readers, spent a couple of weeks last month in Canada, his home.

EX SECRETARY LINNIG is now having a "good time," as he expresses it, in Asbury Park, N. J. He seems to be quite fond of Brooklyn, his adopted home, where he has been practicing "elegant" since graduation. Let's see, Brooklyn is noted for its pretty girls. However, this no insinuation, Mr. Ex-Secretary.

ANOTHER one of the fortunates is E. J. Horton, who has a nice position in the Catskills, where he will have an ample opportunity of getting plenty of ozone, inasmuch as he has been confined in the city for some time the change should be quite aggreeable to him.

PETER SEAGRIST, 132d st. and Lenox ave., is another wheel enthusiast. Have seen him upon several occasions skimming along as serenely as possible, evidently taking considerable comfort from his silent steed.

J. T. MONK, 87th st. and 2d ave., and August Bresloff, 253 Grand Ave., Astoria, both anticipate joining the Alumni in October, the next meeting being the 9th of that month.

WALTER KOENNEMANN is no longer an "East Sider," he having accepted a position with J. Ohlefeld, of 8th ave., where he may be found mostly any day dispensing in an up to date fashion.

NELSON S. KIRK. PH. G.,
9 E. 59th st.

Our Graduates.

THE marriage of Mr. Arthur J. Reider, of this City, Class '90, N. Y. C. P., to Miss May Sutherland, of Albany, was celebrated Tuesday, June 25, 1895, at the home of the bride's relatives, Hoboken, N. J., after which the happy couple started on an extensive wedding tour. We all wish them much happiness and contentment on their journey through life.

MR. JOHN C. NIELSEN expects to study medicine in New York City next fall.

EDWARD P. WEED, Class '95, has purchased the drug business for some years conducted by G. A. Gregory & Co., on Wall st. The store was established by his grandfather, the late John A. Weed, in 1820, and after his death was was conducted by Edward P. Weed, now deceased, father of the present proprietor. The first-class reputation that the store now enjoys, will be fully sustained and kept up by Mr. Weed. Mr. Gregory will remain at the store for some weeks, as will also the prescription clerk, Mr. Harold Glendenning, Class '96, N. Y. C. P.

DEATH OF OTTO WELLS.

C. Otto Wells was born in Corvallis, Oregon, on the sixth day of January, 1870, and at the time of his death was, therefore, twenty-five years and four months old. With the exception of a few years, he has lived in the place of his birth and grown to manhood among those who knew him as a child. He attended school at the old Corvallis College for some time, and then took a course in the Portland Business College, graduating from that institution in 1887. Returning home, he again resumed his studies in the college, and graduated from the Agricultural College in June, 1890, with the degree of Bachelor of Science.

During his course in the college, he manifested much interest in the study of chemistry, and was made assistant to Dr. P. H. Irish, of that department. Infatuated with the subject, he determined on becoming a pharmacist, and, accordingly, in the year 1891 he went to New York city to study. After spending two years there, he graduated in April, 1893, from the College of Pharmacy of the City of New York, and returned home to Corvallis. In September, 1893, he became a full partner with T. Graham, under the firm name of Graham & Wells.

With him he brought the latest and most improved methods, and as a result of his ideas the business has increased and they were enjoying an excellent trade. His entire work in school and in business was characterized by his thoroughness. He was a member of the Agassiz Club of the college and a prominent member of the alumni.

By his death his parents have lost a devoted son, in whom they might well feel proud; a host of friends have lost a true companion, and the State a reputable and valuable citizen, whose influence, had his life been spared, must have been felt.

WHAT ONE OF THE CLASS OF '93 THOUGHT OF THE "OUTING."

Oh ! boys, those of you who were not there, what a glorious time you missed. It was one of those rare days, that was like wine, the older it got the better it was, until the acme was reached when we all sang pathetic ballads, in voices of different complexion, on the homeward journey.

It did not take us long to get acquainted, for before we were on the train three minutes we were having as jolly and sociable a time as if though we had slid down each other's cellar door all our lives. When we arrived at Barton, we all piled into what was evidently a mudscow on wheels, and sat on boards, which had the soft side turned downwards, and started across a very pretty slice of country. Although some of the younger element insisted on contaminating the atmosphere with cigarette smoke, still we older and more sedate folks managed to get one of Prof. Elliott's ozone jags on. Anyhow, I am sorry, but justice demands it, and I must here chronicle that the flowery speeched Tannenbaum "cribbed" 30 cents on the trip which he selfishly refused to "divvy." The degeneracy of the age is proven. When we arrived at the pavilion, every one made a rush for liquids, the biggest run being on an amber-colored fluid with a high white collar on it, which I once heard was known as German disturbance.

And the girls! Say, fellers, they were the jolliest, prettiest girls you could see in a day's walk or run either, for that matter. Much of the success can be laid to their amiable aid.

After making mud of the dust in our throats, and then washing away the mud with another glass or two we went sailing. Here we displayed our talents. Mr. Stover in trying to get his bay window down low enough to avoid injuring the boom, when it passed over him, Mr. Mason in singing some of his jolly songs in that melodious voice of his. Mr. Burger in always being in the way; the girls in looking picturesque, Mr. Tannenbaum in appearing in a yachting cap *a la* George Gould, and all of us getting slightly moist and very, very hungry. When, after various hair-breadth escapes and thrilling rescues we again sighted our haven and were safely on shore, we posed to our best advantage and had our "pictures took." Here a joyful surprise awaited the '93 boys for Billy Reuswig as plump as a Hoboken Alderman appeared. After a hearty dinner, during the progress of which the orchestra rendered several fine selections, speeches were in order. Among those who made offers on the altar of oratory were: Miss Mahoney, who in a few well chosen words expressed herself in the deepest sympathy with the Alumni interests; Mr. Mason, whose characteristic speeches we know so well and which must be heard to be appreciated, as my humble pen can convey but a poor idea of it. Messrs. Stover, Rogers, Tannenbaum, Keal, De Sutro and Burger allowed their respective lights to shine. We then danced, by the sad sea waves, until we were gently informed that we had to hustle to catch the last train back to civilization and our well beloved mortars.

Too much praise cannot be given the Committee for the success of the affair, when one considers all the disadvantages they had to contend with. On the homeward journey we all envied our more fortunate brothers who were Benedicts, while we poor sinners had to suck our thumbs and think of conjugal felicity.

Wake up, boys, take an interest in the Alumni, and you will never regret it, for we have a good time and our old friendships are strengthened and many new ones formed.

Among them present were: Mr. A. Stover H. Graeser. Mr. and Miss Mason, Mr., Mrs. and Master Keale, Miss Monaghan, Miss Mahoney, Mr. and Mrs. Wolfe, Mr. and Mrs. Frölich, Mr. and Mrs. J. Tannenbaum, Mr. Zeller, Mr. J. H. Rogers, Mr. G. Burger, Mr. Ihmels, Mr. Munson, Mr. Lohr, Mr. Reuswig, Dr. Horn, Mrs. Dr. Owens, Miss Owens, Ph. G., Mr. and Mrs. Breen, and many others.

E. F. LOHR, PH. G., '93.

A LOVER AND HIS LASS.

AFTER READING THE MEDICAL PRESS.

He:

Take, oh! take those lips away!
  Not but that I want to kiss them,
Not but what, believe me, pray,
  I most certainly shall miss them.
Heretofore, you know, I've joyed
  In our frequent lip-communion;
Never yet have I been cloyed
  With the sweets of labial union.
    'Tis on other grounds, I say,
    "Take, oh! take those lips away!"

My decision is no whim,
  Due, my love, to fit of vapors,
'Tis the consequence most grim
  Of perusing doctor's papers;
For these journals now declare,
  With malign persistence, Beryl,
That each kiss in which we share
  Reeks (excuse the word) with peril.
    That is why I'm forced to say,
    "Take, oh! take those lips away!"

She:

Try not thus to me dissuade,
  For in vain is your endeavor,
What, shall I shrink back afraid,
  When my Edwin dares? No, never!
Darling, you know well our case,
  Love has bound us in one tether,
So, if there be risks to face,
  We will face them both together;
    As you love me, then, don't say,
    "Take, oh! take those lips away!"

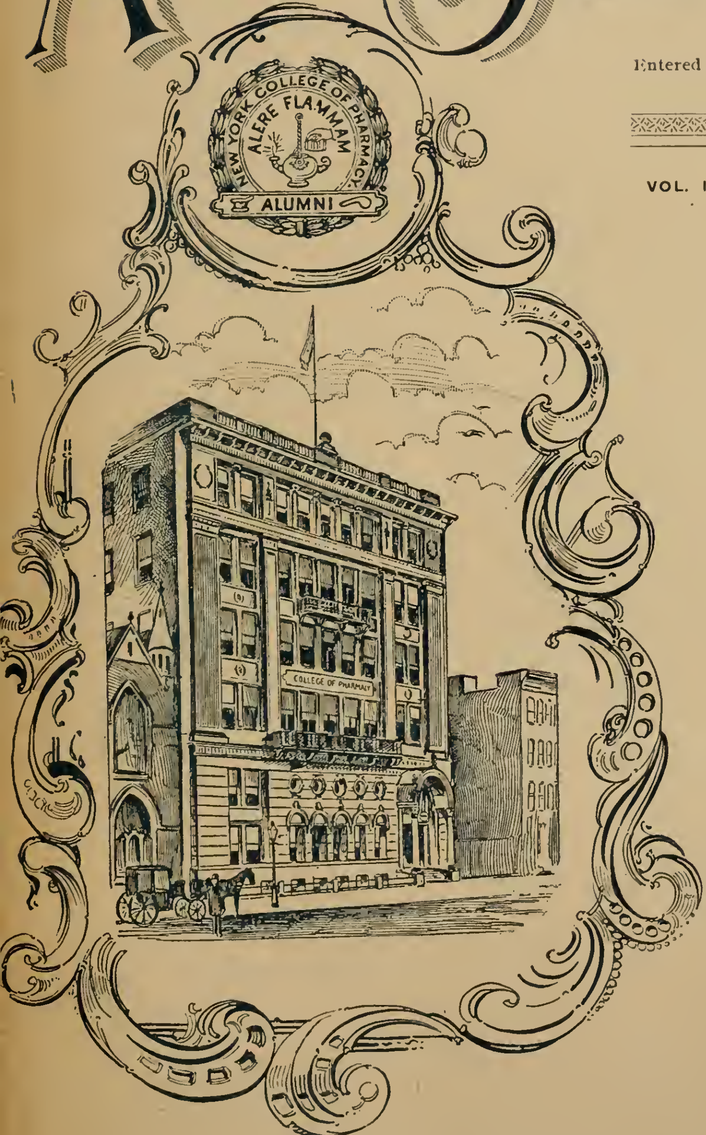
He and she:

We will never be coerced
  By the bullying bacillus,
Doctors, though they say their worst,
  With dismay shall never fill us,
Let us, therefore, both of us,
  Their last raven-croak dismissing,
Show that thus—and thus—and thus!
  We still mean to go on kissing.
    Neither of us means to say,
    "Take, oh! take those lips away!"

—*London Truth.*

Argon is shown to be present in the atmosphere, and may be isolated, according to M. Guntz (Comp. rend.) by absorbing the nitrogen by means of lithium heated to a temperature below a dull red heat.

The Alumni Journal



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SANTAL WOOD OIL.

BY E. J. PARRY, B.Sc.

In the recent advances made in quantitative methods for the examination of essential oils, santal oil appears to have been entirely neglected. Chapoteaut, after a very careful study of the oil, announced some time ago that it consisted almost entirely of two bodies $C_{15}H_{26}O$, an alcohol termed santalol, and $C_{15}H_{24}O$, probably the corresponding aldehyde, which only occurs in small quantities. These facts made me think that a quantitative method for the estimation of the value of the oil would not be difficult to apply. Naturally, I turned my attention, in the first place, to the presence of the aldehyde; but, although unable to devise any modification of the well-known bisulphite method to separate this body, I was able to confirm its presence, and hope later on to have a method for its estimation to announce. The alcohol then, of course, occupied my attention. I may here mention that there are present in normal santal oil traces of an acid probably due to oxidation of the two bodies above mentioned, and variable quantities of a saponifiable oil, possibly an ester of santalol. Santalol, however, appears to constitute the bulk of the oil, and the aldehyde lowers the gravity of the oil, while the saponifiable oil raises it. After a number of experiments, I found that the best way of valuing the oil was by an estimation of the amount of santalol (or other alcoholic bodies if they are present, expressed in terms of santalol). This is effected by conversion of the santalol into an acetate and an estimation of the amount of acetic acid present in the acetylated oil. To save tedious calculations, the result may be expressed in terms of potash necessary to saponify the acetylated oil. About 10 grs. of the oil are digested with an equal volume of glacial acetic acid (this should be at least 99.5 per cent.), in a pressure flask for an hour and a half at 150°. The resulting oil should be well washed in a separator until the last traces of acetic acid are removed. After drying the oil it is saponified with alcoholic potash in the ordinary way, and the amount of potash used is noted. In my first set of experiments very constant results are found. In the first column the percentages of potash used for saponifying the original oil are given. The second figure gives the amount of potash necessary to saponify the acetylated oil, and the third column gives the percentage of santalol present in the original santal oil, assuming, of course, the correctness of Chapoteaut's statements.

No.	Amount of KOH to saponify. Original oil.	Acetylated oil.	Percentage of santalol.*
1	0.96 per cent.	19.33 per cent.	85
2	0.88 "	19.09 "	85
3	0.85 "	18.66 "	83
4	0.62 "	19.26 "	87
5	0.63 "	19.85 "	90

* Decimals neglected.

The first figure confirms Cripps' results, viz., that 1 per cent. of KOH is sufficient for saponification of the oil. The second column shows what a large quantity of acetic acid has been taken up; and, as will be seen later, is sufficient to detect adulteration with cedar wood oil, as the oil contains a very small quantity of bodies of an alcoholic nature.

The specific gravities and iodine absorptions of the five samples above described are given in the following table. The iodine solution used is Hübl's, and the only precautions to be observed are to allow the action to take place for 10 hours, and to use large excess of iodine. The results are all within the limits 190—210, and are more reliable than bromine absorptions.

	Specific gravity.	Iodine absorbed.
1	.9803	199.5 per cent.
2	.9779	195.7 "
3	.9800	204.0 "
4	.9794	210.3 "
5	.9787	190.6 "

These results suggested to me an explanation of the increase in gravity of the oil as distillation proceeded. Particulars of this were given in a paper by Mr. Conroy at the Nottingham Conference. Mr. Conroy was kind enough, at my request, to distil a 20-lb. batch of oil and send me the first, middle, and last two ounces. These were examined in the methods above described, with the results given below. These figures prove that the greater part of the aldehyde comes over in the earlier fractions, and that the saponifiable oil of highest boiling point increases in quantity as distillation proceeds, and accounts for increase in gravity. The iodine absorptions of the three fractions all fall within the limits above suggested, namely, 190 to 210 per cent.

	Sp. Gravity.	Iodine.	KOH Original Oil.	KOH for Acetylated Oil.	Santalol.
First fraction	.9649	197.9	0 44 p.c.	17.03 p.c.	76 p.c
Middle fraction	.9758	200 6	0.65 "	20.44 "	93 "
Last fraction	.9805	190.9	1.04 "	19.66 "	87 "

In order to ascertain if any appreciable change took place during the acetylation other than the formation of the alcoholic acetate, the iodine absorption was taken of a sample after acetylation. Calculated for the increased weight, it should have been 172.6 per cent.; found 173.0 per cent. The constitution of the oil appears, therefore, not only to be materially altered by this treatment. As cedar wood oil is a very frequent adulteration of santal wood oil, I examined four samples by the method above described. The oil evidently contains very small quantities of alcoholic bodies, which is in agreement with the lately published statement that normal cedar wood oil does not contain much, if any, cedar camphor, as the alcohol would certainly be associated with the corresponding alcohol. The following amounts of potash were found necessary to saponify the acetylated cedar oils:

1	2.32 per cent.
2	2.21 "
3	2.13 "
4	1.72 "

The average quantity used is, therefore, 2.1 per cent. It is, therefore, clear that this method enables one to detect and estimate approximately the quantity of cedar wood oil in an admixture of the two oils. Of course, further experiments may show that slightly wider limits are necessary in the figures, but if this is so, it can only be to a very slight extent, and would not alter the general value of the process. In conclusion, I may say that the 12 samples here dealt with are of absolutely guaranteed authenticity, for which I am able to vouch with certainty.*

THE HODGKINS FUND PRIZES.

REPORT OF THE COMMITTEE APPOINTED BY THE SMITHSONIAN INSTITUTION TO AWARD THE HODGKINS FUND PRIZES.

The Committee of Award for the Hodgkins prizes of the Smithsonian Institution has completed its examination of the two hundred and eighteen papers submitted in competition by contestants.

The Committee is composed of the following members :

Dr. S. P. Langley, chairman, *ex officio ;* Dr. G. Brown Goode, appointed by the Secretary of the Smithsonian Institution ; Assistant Surgeon-General John S. Billings, by the President of the National Academy of Sciences ; Professor M. W. Harrington, by the President of the American Association for the Advancement of Science.

The Foreign Advisory Committee, as first constituted, was represented by Monsieur J. Janssen, Professor T. H. Huxley and Professor von Helmholtz ; and after the recent loss of the latter, Dr. W. von Bezold was added. After consultation with these eminent men, the Committee decided as follows :

*Read at the British Pharmaceutical Conference.

First prize, of ten thousand dollars, for a treatise embodying some new and important discoveries in regard to the nature or properties of atmospheric air, to Lord Rayleigh, of London, and Professor William Ramsey, of the University College, London, for the discovery of *Argon*, a new element of the atmosphere.

The second prize, of two thousand dollars, is not awarded, owing to the failure of any contestant to comply strictly with the terms of the offer.

The third prize, of one thousand dollars, to Dr. Henry de Varigny, of Paris, for the best popular treatise upon atmospheric air, its properties and relationships. Dr. de Varigny's essay is entitled : "L'Air et la Vie."

After having performed the function to which the Committee was called, as announced by the circular of the Secretary of the Smithsonian Institution, dated March 31, 1893, which function did not include the award of any medals, there remained several papers to which the Committee had been unable to give any prize, but to which they had felt desirous to give some honorable mention, and on their representing this to the Smithsonian Institution they have been commissioned to do so, and also to give certain medals of silver and bronze which had been subsequently placed at their disposition

The Committee has decided that honorable mention should be made of the papers, twenty-one in number, included in the following list, which also gives the full names, titles and addresses of the authors, and the mottoes or pseudonyms which in four instances were employed. To three of the papers a silver medal is awarded and to six a bronze medal.

HONORABLE MENTION WITH SILVER MEDALS.

Prof. A. L. Herrera and Doctor Vergara Lopez, of the City of Mexico : "La

Atmosfera de las altitudes yel bienstar del hombre.

Mr. C. L. Madsden ("Geo.") Helsingor, near Copenhagen, Denmark.

Thermographical Studies . Mr. F. A. R. Russell, of London, Vice-President of the Royal Meteorological Society of Great Britain ; "The Atmosphere in relation to Human Life and Health."

HONORABLE MENTION WITH BRONZE MEDAL.

M. E. Deburaux-Dex and M. Maurice Dibos ("Spes"); of Rouen, France : "Etudes des courants aériens continentaux et de leur utilisation par des aerostats long-courriers."

Doctor O. Jesse, of Berlin : "Die leuchtenden Nachtwolken."

Doctor A. Loewy, of Berlin : "Untersuchungen über die Respiration und Cirkulation unter verdünnter und verdichteter sauerstoffarmer und sauerstoffreicher Luft."

Mr. Alexander McAdie ("Dalgetty"), of Washington : "The known properties of atmospheric air considered in their relationships to research in every department of natural science, and the importance of a study of the atmosphere considered in view of these relationships : the proper direction of future research in connection with the imperfections of our knowledge of atmospheric air and the conditions of that knowledge with other sciences."

Mr. Hiram S. Maxim, of Kent, England : "Natural and Artificial Flight."

Doctor Franz Oppenheimer and Doctor Carl Oppenheimer ("E pur si muove"), of Berlin, Germany : "Ueber atmosphärische Luft, ihre Eigenschaften und ihren Zusammenhang mit dem menschlichen Leben."

HONORABLE MENTION.

Mr. E. C. C. Baly, of University College, London : "The decomposition of the two constituents of the atmosphere by means of the passage of the electric spark."

Professor F. H. Bigelow, of Washington : "Solar and Terrestrial Magnetism and their relation to Meteorology."

Dr. J. B. Cohen, of Yorkshire College, Leeds, England : "The Air of Towns."

Dr. F. J. B. Cordeiro, U. S. N., of Washington : "Hypsometry."

Professor Emile Duclaux, of the French Institute, Paris, France : "Sur l'actinométrie atmosphérique et sur la constitution actinique de l'atmosphère."

Professor Dr. Gieseler, of Bonn, Germany . "Mittlere Tagestemperaturen von Bonn, 1848–88."

Doctor Ludwig Ilosvay von Nagy Iloosva, Professor in the Royal Joseph Polytechnic School, Budapest, Hungary: "Ueber den unmittelbar oxydirenden Bestandtheil der Luft."

Doctor A. Magelssen, of Christiania, Norway : "Ueber den Zusammenhang und die Verwandtschaft der biologischen, meteorologischen und kosmischen Erscheinungen."

Doctor A. Marcuse, of the Royal Observatory, Berlin, Germany : "Die atmosphärische Luft."

Professor C. Nees, of the Polytechnic School, Copenhagen, Denmark : "The use of kites and chained air-balloons for observing the velocity of winds, etc."

Surgeon Charles Smart, U. S. A., of Washington : "An Essay on the Properties, Constitution and Impurities of Atmospheric Air, in relation to the promotion of Health and Longevity."

Doctor F. Viault, of the Faculty of Medicine, Bordeaux, France : "Découverte d'une nouvelle et importante propriété physiologique de l'Air atmospherixue (action hematogène de l'air rarefie.
—*Science*.

NOTE.—The Hodgkins Fund, from which these prizes were drawn, was established in October, 1891, by Thomas George Hodgkins, of Setauket, N. Y. The donor specified that the income from a part of this fund was to be devoted to the increase and diffusion of more exact knowledge in regard to the nature and properties of atmospheric air in connection with the welfare of man.

An announcement of the prizes which were offered was made by the Secretary of the Smithsonian Institution on March 31, 1893. The offer of a prize of this value excited general interest throughout the civilized world, and papers were received from nearly all those who were it all interested in this branch of scientific research.

It is not likely that the income from this fund will be expended exactly in this way another year, but another method may be adopted, which will accomplish the same purpose.

Terpene Alcohol Esters.—A patent has been taken out by Bertram, of Leipzig, for the preparation of fatty acid esters of the terpene alcohols, such as borneol geraniol, linalool, and menthol. These alcohols, or the essential oils containing them, are treated with fatty acids (acetic, valerianic, or propionic) at a low temperature with the addition of a small quantity of mineral acid—either H_2SO_4, HNO_3 or HCl. After the reaction is ended, the mixture is diluted with water, and the resulting ester is separated by shaking with soda solution, separating in the usual way, treating with dilute acid and distilling to purify it. The esters are used in perfumery—as bornyl formate and valerianate—and also in medicine.—*Berichte.—Br. and Col. Dr.*

Localization of Strychnos Alkaloids.—Sauvan states, as the result of some preliminary micro-chemical tests on the seeds of strychnos Nux Vomica, and S. gaulteriana, that these alkaloids of Nux Vomica are found solely in the cells of the albumin and of the embryo, and not in the seed coats.—*Journal des Pharm.*

Porosity of Glass.—That glass is porous to molecules below a certain weight and volume has been shown by recent electrolytic experiments made by Prof. Roberts-Austen, of the Royal Mint. A current was passed through a a vessel containing an amalgam of sodium separated by a glass partition from mercury. After awhile the amalgam was found to have lost a certain amount of its weight, while the same amount had been added to the mercury. The same result was obtained with an amalgam of lithium ; but with potassium, whose atomic weight and volume are high, the glass could not be penetrated.

NOTES OF A RESEARCH UPON IPECACUANHA.

BY R. A. CRIPPS, F. I. C.

The author had, at the Cardiff meeting of the Conference, in conjunction with A. Whitby, read a paper on this drug.

Eight hundred grammes of ipecacuanha was exhausted by successive percolation with ether (specific gravity, 717) and rectified spirit. The solvents were recovered by distillation.

1 *Ether Extract* = 0.44 per cent. of Root.—By petroleum ether this was almost entirely dissolved, and on removal of that solvent the residual oily matter was found to be mostly soluble in alcohol, yielding a fluorescent solution, which by titration indicated acidity equivalent to 0.22 per cent. of oleic acid, by direct weighing 0.205 per cent. was obtained. The fatty acids were converted into lead salts and treated with ether, whereby oleate of lead was obtained equivalent to 0.15 per cent of oleic acid. This ethereal extract contained a mere trace of an alkaloid, but no glucoside, and no salicylic acid or salicylate. The actual results obtained were:

Oleic acid	0.15 per cent.
Palmitic (?) acid	0.055 "
Neutral fat	0.14 "
Wax	0.04 "
Resin	0.025 "
Alkaloid	Mere trace.

2. *Alcoholic Extract.* — The residue from distillation of the solvent was dissolved in water, filtered, etc., extracted by chloroform whilst still acid, and then successively by ether and chloroform, after rendering alkaline by ammonia.

The Acid Chloroform Extract contained some alkaloid.

The Alkaloid extracted by ether from alkaline solution was dissolved in 25cc. absolute alcohol, 25cc. of ether (.717) added—the solution remaining clear—then 50cc. of ether containing about 25 per cent. of hydrochloric acid gas, whereby a nearly white precipitate was formed, which passed into a tenacious mass; the clear liquid was poured off, and more ethereal HCl added, until the whole of the alkaloid was precipitated, the various fractions, *a*, *b*, *c*, *d*, *e* and *f*, being obtained. Each of these alkaloidal salts was dissolved in 100cc. of distilled water, and portions set aside; only one, *b*, formed crystals of hydrochlorate.

Ths compound *f* was very small in quantity; *a* and *e* were, therefore, chosen for conversion into gold and platinum double salts. The filtrate from each of these compounds was treated with sulphuretted hydrogen, filtered, and the filtrate agitated with ether, after rendering alkaline by ammonia. The traces of alkaloid so obtained were weighed and deducted from the original amount taken, for calculation of the percentage present in the double compounds.

PLANTINUM SALTS (Anhydrous).

	Alkaloid A. Per cent.	Alkaloid B. Per cent.
Platinum	21.30	21.57
Alkaloid	55.24	53.81

The formula for Paul's alkaloids require:

	Emetine. (M. W. 248). Per cent.	Cephæline. (M. W. 234). Per cent.
Platinum	21.46	22.15
Alkaloid	54.78	53.34

Kunz's formula requires (M. W. 508):

	Per cent.
Platinum	21.18
Alkaloid	55.38

GOLD SALTS (dried at 49° C., decomposed at 100° C).

	Alkaloid A. Per cent.	Alkaloid E. Per cent.
Gold	32.44	32.20
Alkaloid	40.95	41.01

Paul's alkaloids require:

	Emetine. Per cent.	Cephæline. Per cent.
Gold	32.45	33.22
Alkaloid	40.96	39.56

Kunz's formula requires:

	Per cent.
Gold	32.13
Alkaloid	41.55

Tho gold salts of these two alkaloids are practically identical in composition, and the figures agree closely with those required by emetine (Paul), neither corresponding with cephæline, or with Kunz's formula for emetine. Neither of the platinum salts corresponds with that of cephæline; that of *a* agrees fairly with either Paul's or Kunz's emetine, and the amount of platinum in the *e* compound is near that of Paul's emetine; the low figure for alkaloid in this case is probably an experimental error.

These being extreme fractions of the original alkaloidal substance (except the very small amount of *f*), it is reasonable to conclude that each of the above fractions is of the same composition; and, therefore, that this sample of ipecacuanha contains no cephæline, but only emetine, in the ether-soluble alkaloid.

When the alkaloid from either of the fractions *a* to *e* is dissolved in chloroform and the solvent allowed to evaporate spontaneously, the residue obstinately retains chloroform. This compound fuses at about 50° C, but does not lose its chloroform, even at 60° C, at which temperature about 14 per cent. is retained. When cold the compound is quite hard, and the addition of the dilute hydrochloric acid causes the separation of chloroform in drops. At 82° C the chloroform volatilises, leaving the alkaloid pure.

A solution of either of these fractions in water does not yield quite the whole of the alkaloid when agitated with ether and ammonia; in every case a trace of alkaloid was left, which readily dissolved to a yellowish fluorescent solution in chloroform, just as was observed when treating the original solution of the alcoholic extract of the root. This is worthy of further research, for it leads to the suggestion that the chloroform soluble alkaloid may be produced by the action of the alkali upon emetine.

The figures for platinum salts given above are those formed in the presence of excess of platinum chloride. When the alkaloid is in excess the proportion of metal is only 16.46 per cent.

Whilst the inquiry has been in progress, Mr. Cripps also carried out a few experiments bearing upon the chemistry and pharmacy of ipecacuanha:

1. Arndt having published further information with regard to his volatile alkaloids, which he states to be identical with choline, the author repeated his process, using 100 grammes of the root, but has been unable to detect any trace of volatile alkaloid.

2. Arndt has described a process for the determination of ipecacuanha alkaloids, based upon his researches on the volatile alkaloid. He treats the powdered root with sodium carbonate and ferric chloride in presence of boiling methyl alcohol (60 per cent.), under an inverted condenser, filters, and evaporates the filtrate, whereby choline is dissipated; he then takes up the residue with dilute ammonia, and agitates with chloroform to extract the alkaloid. This solution is separated, agitated with dilute acid, and the aqueous liquid finally titrated with Mayer's solution. The author confirms Arndt's statement that this process yields lower results, having obtained 1.32 per cent. of alkaloids from a sample which yielded to Lyons' process 2.45 per cent. The working of Arndt's process is very tedious.

The following figures are examples of the yields by various processes:

Process.	Alkaloid weighed.	Alkaloid titrated. eq. 254.	Alkaloid titrated. eq. 248
Lyons (1)	39.3 m.g.	39.5 m.g.	38.6 m.g.
" (2)	43.0 "	42.0 "	41.0 "
Keller (1)	102.0 "	87.0 "	85.0 "
" (2)	111.0 "	95.9 "	93.6 "
Acetic ether.	31.1 "	31.0 "	30.3 "

A weaker acid yields a better result. Thus two portions of the root, each weighing half a pound, were exhausted, the one by the official process, the other by percolation with dilute acetic acid, 1 to 20. The extract from the latter was more readily dried and pulverized than that of the former. They weighed B. P. 900 grains; weak acid extract, 803 grains; alkaloids, 8.24 per cent., and 10.6 per cent. corresponding to a total of 73 grains and 85 grains, respectively.—*Paper read before the British Pharmaceutical Conference.*

NOTE ON THE DETECTION OF FORMALIN.*

By H. DROOP RICHMOND AND L. KIDGELL BOSELEY.

A solution of formaldehyde, called *formalin*, having come into use as a food preservative, it becomes of importance to be able to detect and estimate it. The literature of formaldehyde is very voluminous, and numerous tests for it have been proposed. As is well known, aldehydes reduce Fehling's solution and ammoniacal silver nitrate, and give Schiff's reaction. These reactions, however, are by no means characteristic of the aldehyde. Legler's method for the estimation of formaldehyde by titration with ammonia is to a certain extent characteristic of formaldehyde, but it is not applicable to dilute solutions. Legler states that three molecules ammonia are equal to four of formaldehyde, while Lösekan maintains that three molecules are equal to six of formaldehyde. This discrepancy is explained by Eschweiler, who shows that with methylorange, cochineal, tropæolin and congo-red, six molecules are indicated, while with litmus and phenolphthalein only four. This is due to the acid reaction of the hexamethylene-tetramine formed.

Plöchl states that when a neutral solution of formaldehyde is mixed with ammonium chloride it becomes acid; on heating CO_2 is evolved, and trimethylamine is formed. Kleeberg shows that formaldehyde combines with phenols in the presence of HCl, but he did not succeed in purifying the compounds formed. Pulvermacher, in a series of papers, describes many condensation products with substituted ammonia, and also shows that the very insoluble formalazine is produced by mixing formaldehyde and hydrazine hydrate; this yields a platinochloride $(C_2H_4N_2)_6H_2PtCl_6$.

*Reprinted from the *Analyst.*

Trillat gives the following tests for formaldehyde: The solution is to be mixed with dimethylaniline acidified with sulphuric acid and agitated. After heating for 30 minutes on the water bath, it is made alkaline, boiled until the smell of dimethylaniline has disappeared, then filtered. If the filter paper be moistened with acetic acid and powdered lead oxide be sprinkled on it, a blue color, due to the formation of tetramethyl-diamido-diphenylmethane is produced if formaldehyde is present. Or the formaldehyde solution may be mixed with a solution of aniline (3 Gm. to 1 liter), when a white precipitate of anhydro-formaldehyde aniline appears which may be weighed. A precipitate is also given by acetaldehyde. Trillat says that, as formaldehyde easily forms condensation products, it is not always detected in food after a lapse of time.

Three years ago one of us worked with formaldehyde as a preservative for milk, and used as a method for its detection the reduction of Fehling's solution, or of ammoniacal silver nitrate solution. Quite recently Thomson (*Chem. News*, lxxi., 247) has proposed the use of the latter, and, although he modifies the test by working in the cold, he does not succeed in obtaining a reaction which is characteristic of formaldehyde.

Schiff's reagent has been used as a test for formaldehyde. It is, however, very unsatisfactory unless care be taken, for if an excess of sulphurous acid is used, no reaction is obtained with traces of formaldehyde, and any alkali combined with an acid weaker than SO_2 also gives a red coloration. The red coloration appears on warming Schiff's reagent, on blowing air through it, or even on placing it in an uncorked bottle, so that unless great precautions are taken the test is unreliable. Still, it is useful as a confirmatory test. In applying it as such to milk, we precipitate the casein with a little sulphuric acid, filter and then add a little Schiff's reagent to the filtrate; any red color which may appear roughly indicates the amount of formaldehyde present.

Another test which we believe to be well known, though it has not actually appeared in print, was pointed out by Hehner. It is the formation of a blue color when milk, formaldehyde and sulphuric acid are mixed together. This was first brought to our notice by Bevan, who had obtained a blue color in a Leffman-Beam experiment, which he could not account for. We suggested that it might be due to formaldehyde, but we were unable to obtain the reaction with other milks, owing to our having used an excess of formaldehyde. We find that when formaldehyde is in large quantity, say 0.5 per cent., no blue color is obtainable.

We have since found that the above reaction is due to the albuminoids of milk. We have also obtained it from egg albumen and peptone, but not from gelatin. To obtain the reaction it is only necessary to add sulphuric acid (95 per cent. H_2SO_4 gives the best results) to the milk, when a blue ring is formed at the junction of the two fluids. The food suspected may be distilled and the formaldehyde obtained in plain aqueous solution; but we prefer the use of peptone for testing, as the blue color is not then obscured by the charring of the organic matter by the acid.

Bearing in mind Pulvermacher's researches, we have found a reaction between formalin and diphenylamine. A solution of diphenylamine in water is made, just sufficient sulphuric acid being added as will effect solution. The liquid to be tested (or the distillate), is added to this solution and boiled. In the presence of formaldehyde a white flocculent precipitate is deposited, which is often colored green if the acid used contained nitrates.

We find it most convenient to distill into the diphenylamine solution and then boil. This simple test we believe to be characteristic of formaldehyde.

We are engaged in determining the composition of the precipitate, and in working out the quantitative estimation of formaldehyde in this manner. We are able to confirm Trillat's observation that after a certain time formaldehyde cannot be detected. We can obtain the reaction in milk which has not curdled. We think from the list of methods enumerated that there is not the slightest difficulty in definitely proving the presence of formaldehyde in foods when present. Hehner's reaction, confirmed by the diphenylamine test, Schiff's test, and those proposed by Trillat, Pulvermacher and Plöchl, should be amply sufficient.

Caffearine.—Paladino has isolated from coffee beans a new alkaloid, crystallizing in needles, which he proposes to name caffearine. It is precipitated by potassio-bismuthic iodide after the removal of theine by shaking with chloroform. From the precipitate the alkaloid can be regenerated.—*The Druggists' Circular and Chem. Gazette.*

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THE POST GRADUATE COURSE.

THE opening of the Post Graduate course at the College ought to, and we believe it will, give an impetus to original investigation.

It is the hope of the Editor to be able to record in the pages of the Alumni Report many contributions upon pharmaceutical subjects by members of the Alumni ; the future of the pharmacist depends upon a more perfect and concise knowledge of the remedies he handles. Much as pharmacy has advanced within the past decade, there yet remains many unsolved problems. Plant analysis in particular is a field which will well repay all work and study spent upon it.

When we stop to consider the state of knowledge of some of the most important drugs which are daily handled, we find it is not as definite as might be wished, and it offers many inducements to the earnest and ambitious student.

It would be well if a series of prizes were inaugurated by the Alumni Association, for original work done in the Post Graduate Laboratory. If these prizes were for money, they might help reimburse those who had the natural ability, but not the means at hand to carry out their investigations.

Much good, we believe, might be done in this way, and students encouraged to continue their studies which otherwise they might not be able to do.

In this connection, it seems strange that the benefits which pharmacy has contributed to mankind, have received so little recognition. Endowments of medical colleges and scientific schools occur on every hand, and yet pharmacy is neglected. How long is this to continue, and wherein lies the cause? The only reason we can find for this, is that the public refuses to believe that Pharmacy is a profession. It lies with the Alumni to remedy this; and by original work and investigation, to become imbued with the scientific spirit which is needed to create a profession. Recognition will come, and with it endowments, when the public begins to see that the pharmacist's daily life is a professional one. This change can be brought about by demanding a better education of applicants before they commence the study of pharmacy, and after graduation offering them a course of study, such as the Post Graduate now furnishes, so as to keep the professional and scientific spirit alive.

We print with this number two plates, which were received too late to appear with the article on Saw Palmetto, which was printed in the July issue of the ALUMNI JOURNAL. The drawings are by Mr. W. H. Bastedo, Ph. G., Class of '94, and are kindly loaned by the New Jersey State Association, through the courtesy of Mr. W. A. Alpers.

PHARMACY RESEARCH.

"With regard to research; the duty which is incumbent upon every man to do something either to increase the aggregate amount, or to render more exact and scientific the knowledge which is in the possession of his calling cannot be too seriously taken to heart by pharmacists. It is a great mistake, however, to suppose that at any given period a very large number of men are capable of doing original work, or of making discoveries. It must be a sufficient daily task for most men to keep abreast of the discoveries of others, and to have ready for the practical affairs of daily duty a sufficiently intimate acquaintance with the large body of accumulated facts. If this is the case with men of mature age and experience, how much more so must it be with young men? One of the greatest mistakes connected with modern scientific education is the inducement which has been given to young students to write and to talk before they have read and thought.

Occasionally it may happen that an inspired genius may work upon some original line, or wrest a brilliant discovery from the regions of the unknown, without having performed the drudgery of learning what others have done in the same field of labor; but as a rule, with but very few exceptions, the attempt to make young students pursue research will not be successful. The function of education should be to make men accurrate observers, so that they may have confidence that they see what they appear to do; accurate thinkers, so that they may reason with logical precision from the facts which they had observed; and, above all, accurate manipulators, so that they may use the instruments of science in a manner to eliminate a very common source of error, faulty workmanship. The balance and the burette and the microscope require more constant and prolonged practice to learn their accurate use than does the spade or the trowel. Education should aim at giving a sound and extensive foundation in the theory and practice of the science basis of their profession, and should not force them prematurely into an assumption of research.—(*Extract from the President's address at the British Phar. Conference.*)

BOOKS AND PAMPHLETS RECEIVED.

Register of Alumni and Annual Announcement of the School of Pharmacy, University of Michigan, twenty-eighth year, 1895-96.

Monatsblatt der New Yorker Deutschen Apotheker Verein, August, 1895.

Fifth Annual Directory of The Scientific Alliance of New York.

Proceedings of the Alabama Pharmaceutical Association, 1895.

Seventy-fifth Annual Announcement of the Philadelphia College of Pharmacy, 1895.

The Apothecary, July, 1895.

British and Colonial Druggist, August.

"The College of Pharmacy of the City of New York," by Prof. H. H. Rusby, M. D.

Melathin is the name given to a glucoside isolated by Greenish from *Nigela Sativa*. It resembles Sapatoxin, obtained from Quillaja bark, and is regarded by Kobert and Schulz as one of the series of Saponines; it is, however, more toxic than others of the same series.

THE MOST RECENT WORK.

The Alkaloids of Senecio Vulgaris.—An exact study of the bases found in this plant has recently been undertaken by MM. Grandval Lajoux. A preliminary test upon a small quantity of the powdered drug showed that a small amount of alkaloidal substance was present. They have ultimately succeeded in obtaining two new bodies—senecionine and senecine. To prepare the former, the plant is dried and powdered in its entirety; the powder is well mixed with its own weight of a 10 per cent. solution of lead acetate. It is packed in a percolator and and exhausted with water. The liquid is treated with excess of H_2SO_4 to remove most of the lead. It is filtered, and excess of mercury-potassium iodide is added. The complex precipitate contains the whole of the alkaloids. These are liberated in a method very similar to that adopted by the authors in previous work, and the mixed alkaloids are separated by recrystallization from alcohol. The first alkaloid to crystallize is senecionine, which forms very voluminous crystals in rhomboidal tablets. The crystals are anhydrous. They have a bitter taste, and are lævorotary (^{a})d=80.5°. They have a feebly alkaline reaction. The molecular weight, as measured by its saturating power, is 351. Its formula is $C_{18}H_{25}NO_6$, agreeing with the results of the following analysis:

C=61.62 per cent.	N= 3.86
H= 7.26 "	O=27.26

The second base, senecine, has a far more bitter taste than senecionine. It crystallizes beautifully from ether. A crystalline tartrate has been obtained. No formula has yet been assigned to it.—*Journal de Pharmacie.*

Citrophen, an Antipyretic and Antineuralgic.—Dr. Benario (*Deutsch med. Wochens* XXI., p. p. 423,) describes citrophen as a compound of citric acid and para-phenetidine, first obtained by Dr. I. Roos. Citric acid, being a tribasic acid, three phenetidine groups are required to saturate it; two groups more than are contained in phenacetin or lactophenin. If, as has been stated, the antipyretic and analgesic power of the phenetidine compounds depends on the number of phenetidine groups they contain, it would seem, theoretically at least, that citrophen should be much more active than its phenetidine predecessors. Its formula is $C^3H^4OH.CONH.OC^2H^5C^6H^4$. It is a white powder (but can also be obtained in crystalline form) having a faint citric-acid taste, which persists in the mouth for quite a while, imparting to it an agreeably refreshing taste. It melts at 181 degrees C (357.8 degrees F.) and is soluble in about 40 parts of cold, and 50 parts of boiling water; it is, therefore, well adapted to administration in solution and subcutaneously. Acids and alkalies decompose citrophen into its constituents. The author has given citrophen in doses of 0.5 to 1 Gm. (7½ to 15 Grn.) in seven cases of typhoid fever, and has observed that in the course of two hours the temperature falls 2 to 3 degrees C. (3.6 degrees to 5.4 degrees F.) at a period during the disease when the temperature has a tendency to go up. Secondary effects, it is said, were never noticed. When the drug was given in the evening, it exercised a decided sedative action, allowing the patient to sleep quietly. Good results were obtained from this drug in the fever of consumptives; in one case the fever was entirely subdued after using the drug but three days in 0.5 Gm. (7½ Grn.) doses, while at the same time an improvement of the coexisting digestive disturbances was noticed. Equally beneficial results are claimed in other febrile affections. In migraine and neuralgia doses of 0.5 Gm. (7½ Grn.) and even less, rendered very good service. As much as 6 Gm. (90 Grn.) have been given daily without secondary effects being observed, it is stated.—*Merck's Report.*

Chrysophanic Acid.—Dr. O. Hesse points out that the chrysophanic acid of commerce does not contain any of that acid—a fact which has been known for a long time. He obtained the acid from rhubarb by treating with ether, purifying the residue by successive treatment with alcohol, chloroform and potassium-carbonate solution; and crystallization of the acid from hot alcohol. So obtained it melted at 178° C., and its formula is $C_{15}H_{10}O_4$. It dissolves its concentrated sulphuric acid with a deep red color. Boiled with hydriodic acid, it yields a new body—chrysophanhydroanthene, $C_{15}H_{12}O_3$—which is a brilliant yellow-colored flaky powder.

A new test for Hydrogen Peroxide is given by Bach (*Pharm. Centralh.*, xxxvi, p. 342) as follows: First make a solution containing, per liter, 0.3 Gm. of potassium bichromate and 0.25 Gr. of aniline; then prepare a 5 per cent. solution of oxalic acid. To 10 C.c. of the liquid to be tested, add 5 C.c. of the first solution and one drop of the second. There is produced in the presence of hydrogen peroxide a more or less distinct, reddish-purple coloration, which is still distinct in a 1 : 1,400,000 solution of the peroxide. This reaction is not affected by any of the substances found in the juice of plants, nor by the nitrogen acids, it is stated ; however, it is prevented by the presence of chloride of lime or of hypochlorous acid, on account of the aniline and potassium bichromate being present. —*Merck's Report*.

Carniferrine is a new remedial agent, said to be the iron compound of phospho-carnic acid. It is claimed to possess all the properties of the iron compounds occurring in natural foods. It is soluble both in dilute acids and alkalies, and consequently remains unaltered, both in the stomach and in the intestinal canal. Experiments seem to have shown that it is absorbed in the digestive tract. It is recommended against chlorosis, anemia, neurasthenia, loss of blood after operations, in convalescence, etc. The dose is 7½ Grn. (0 5 Gm.) daily for adults, and from 3 to 5 Grn. (0.2 to 0.3 Gm.) daily for children. It may be given in powders, tablets or pills.—*Merck's Report*.

Properties of Acetylene.—P. Villard (*Pharm. Jour.*, LIV, p. 1194), finds that acetylene prepared by Moissan's process resembles carbon dioxide in becoming solidified by its own evaporation when in the liquid state, and under ordinary atmospheric pressure. It is solid at—85 degrees C., its fusing point is—81 degrees C., and the co-efficient of solubility of the gas at O degree C, under a pressure of 4.65 atmospheres, is 1.6. Acetylene hydrate, $C_2H_2(H_2O)_6$, is formed under the same conditions as the hydrate of nitrogen protoxide or carbonic acid; it is denser than water, and forms crystals which are without action on polarized light.

Heliotropin.—Helbing and Passmore mention in the *Pharmaceutical Zeitung* that 37° C. is generally considered to be the melting-point of heliotropin or piperonal; but they find that the pure substance melts at 36.1° C., and this, in fact, is what the best commercial samples give. Absence of vanillin and benzoic acid from piperonal may be proved by rubbing 1 Gr. with 1 drachm of distilled water, adding a little ferric chloride, when no green or bluish color should be produced. Heated with potash solution and a few drops of chloroform, no isonitrile odor should be produced, showing the absence of acetanilid. The authors also provide for the absence of non-aldehydic bodies by shaking 1 Gr. of the heliotropin with a cold saturated solution of potassium sulphite, when the heliotropin dissolves, but in a short time crystallizes out as a double salt of piperonal. The solution is then shaken with ether, the latter washed with water, and evaporated, when there should be no residue.

Scopolamine.—Owing to Ladenburg's statement that this alkaloid is identical with hyoscine, E. Schmidt, its discoverer, has returned to the subject, and maintains the correctness of his earlier researches. He has prepared characteristic gold and plantinum salts of the alkaloid, also derivatives, which are perfectly distinct. Scopolamine is optically active (lævorotatory), but the double hydrobromide with silver is inactive.—*Druggists' Circ.*

Helenin.—J. Berdt and W. Posth find that the formula of helenin is $C_{15}H_{20}O_2$; it possesses a neutral reaction, and dissolves in warm alkaline solutions, being simultaneously converted into the salt of an oxy-acid. The oxy-acid is completely re-converted into the lactone by heating to the melting-point, or, partially, by warming with water; if to the latter a mineral acid is added, the lactone immediately separates. The authors have also investigated several derivatives of alantolactone or helenin.

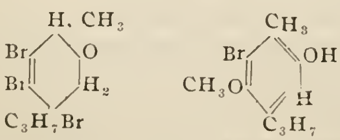
Digitoxine.—It is well known that the various so-called digitalines give very different results in the hands of different experimenters. Professor Masius, of Liege, claims that the alkaloidal digitoxine gives perfectly definite and constant results. It would seem advisable to employ this latter body in preference to digitaline.—*Journal de Pharmacie d'Anvers*.

The Alkaloids of the Fumariaceae and Papaveraceae —Battandier has extracted from *Bocconia frutescens* the base fumarine, identical with that found in *Fumaria*, and also another alkaloid, to which he gives the name bocconine, and traces of a third, resembling chelidonine, and finally, large quantities of chelerythrine. Fumarine is soluble in chloroform but only slightly so in water, alcohol or ether. Its hydrochloride crystallizes in transparent needles. When perfectly pure, it gives with sulphuric acid a violent tint, changing to black by the addition of potassium bichromate. Bocconine is very soluble in most solvents. With sulphuric acid it gives a peach color.—*Annales de Pharmacie*.

A New Product from Blood.—O. Finsen has patented the following process (Jr. Soc. Chem. Ind.): Fresh blood is defibrinated by whipping, and then mixed with six times its bulk of water, to which is added citric acid, 5 Grms., for every litre of blood. The mixture is then heated to 90°, and so kept for a quarter of an hour, The coagulated albumin is strained and very carefully washed with water. After removing the superfluous moisture, the remaining mass is dried at 45° in vacuo, when it constitutes a brittle chocolate colored substance, which must then be reduced to a very fine powder. The inventor claims that this preparation, designated hæmo-albumin, possesses valuable nutritious properties, and has no objectionable taste.—*Pharm. Era.*

Concerning Ricine.—Ouchinsky, in studying this allkaloid (*Med. Sci.*, January, 1895), describes it as a toxic substance contained in the castor bean; it is found in the oil prepared from them when the process has been imperfect. Stilmark places this substance among the albuminous ferments of the order of phytalbumoses; the author concurs in this opinion. On cold-blooded animals ricine has but little action; warm-blooded animals are very susceptible to it, a very small dose proving fatal. It acts more rapidly when exhibited by the stomach and then injected subcutaneously. The temperature rises to 104° F., to fall again below normal. The heart continues to beat after the cessation of respiration. At the autopsy the intestinal mucous membrane is hyperæmic, dotted with punctiform hemorrhages; the liver, kidneys, and spleen are gorged with blood; the intima of the blood vessels show many spots of hyaline degeneration.—*Rev. Int. de Méd. et de Chir. Prat.*, February 25, 1895.

Oil of Thuja.—An abstract of a paper by O. Wallach, of terpene fame, and J. T. Conroy, B. Sc., Ph.D., son of Mr. Michael Conroy, appears in the current number of the *Berichte.* The paper is on thujone tribromide. The authors show that the three bromine atoms have not identical functions in the molecule. By treatment of the bromide $C_{10}H_{13}Br_3O$ with sodium methylate in methyl alcohol, the phenolic compound $C_{10}H_{11}Br(OH)(OCH_3)$ is obtained, melting at 156°-157°, from which, in the usual way, the derivatives $C_{10}H_{11}Br(OC_2H_3O)OCH_3$, melting at 63°-64°, and $C_{10}H_{11}Br(OCH_3)2$, melting at 42°-43°. The constitution of the bromine compound and the phenol are interpreted as



—*Br. and Col. Dr.*

A New Remedy.—Cupratin is a name applied by Filehne to an analogue of ferratin. It is a copper and albumen compound.

The Chemistry of Cinchonine.—Kengk von Norwall recently described the action of sodium and ethyl alcohol upon cinchonine, and stated that he considered that no more than two atoms of hydrogen could be taken up. He is now in a position to correct this statement. Using amyl alcohol and sodium as a reducing agent, he worked with a pure crystalline cinchonine, melting at 257° 258°, obtained from Zimmer. During the process of reduction, a basic gas resembling ammonia was evolved. This was at first attributed to the breaking down of the cinchonine molecule. But it was afterwards found that the purest amyl alcohol obtainable from Kahlbaum contained a nitrogenous impurity which yielded this gas on reduction. The oily reduced base would not yield any crystalline derivatives with acids, methyl iodide, benzoyl chloride, or bromine. But by the action of potassium nitrite and sulphuric acid a nitroso body was obtained. This possessed the formula $C_{19}H_{26}N_4O_4$ and formed crystals melting at 200° C. with decomposition and the evolution of brown vapors. It is extraordinary soluble in the ordinary organic solvents, and is undoubtedly a nitroso-tetra-hydro-cinchonine, thus showing that four atoms of hydrogen are taken up on reduction of the alkaloid.—*Berichte.*

Apolysin.—A new phenetidin derivative, possessing antipyretic and analgesic properties, has received this unwieldy name. It will be remembered that we recently described a new antipyretic under the name of "citrophene." This body was a compound of citric acid in which phenetidin residues had replaced the three acidic groups of the acid, which, of course, is tribasic. Apolysin is citric acid in which only one acid radicle is so replaced. The relationship of the three bodies is shown thus:

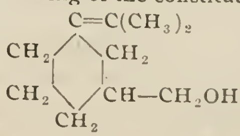
Citric Acid, $C_3H_4(OH)(CO.OH)_3$.

Apolysin, $C_3H_4(OH)(CO.OH)_2.CO\ NH.C_6H_4OC_2H_5$.

Citrophene, $C_3H_4(OH)(CO.NH.C_6H_4OC_2H_5)_3$.

Citrophene, melts at 181°, whilst the mono-substituted body apolysin, melts at 72°.—*Apotheker Zeitung.*

The Constitution of Rhodinol.—Barbier and Bouveault have been working on this body. They consider that it is a primary alcohol, with one double linking of the constitution:



—*Comptes Rendus.*

THE CONSTITUTION OF PSEUDACONITINE.—PRELIMINARY NOTICE.

BY WYNDHAM R. DUNSTAN, F. R. S., and FRANCIS H. CARR.

Pseudaconitine is the name given by Alder Wright to the highly toxic alkaloid contained in Nepaul aconite (*Aconitum ferox*). It is a crystalline base, melting at 104–105°, whose composition is expressed by the formula $C_{36}H_{49}NO_{12}$. When hydrolysed, it furnishes, according to Alder Wright and Luff (*Trans.* 1878) pseudaconine, and dimethylprotocatechuic acid (veratic acid) $C_{36}H_{49}NO_{12} + H_2O = C_{27}H_{41}NO_9 + C_9H_{10}O_4$. The authors are engaged in a re-investigation of this alkaloid in the light of their recent work on the constitution of aconitine derived from *Aconitum napellus* (*Trans.*, 1894, 176, 290).

The pseudaconitine employed by the the authors was extracted from the roots of *Aconitum ferox*, some of which were provided by the Government of India, through the Imperial Institute. The highly-purified crystalline base melted at 201°, that is, nearly a 100° higher than the point recorded by Wright and Luff. This melting point was not changed by fractional crystallization.

When heated slightly above its melting point, pseudaconitine loses a molecular proportion of acetic acid, leaving a new base which it is proposed to name pyropseudaconitine. This alkaloid, or hydrolysis, loses a molecular proportion of dimethylprotocatechechuic acid, furnishing pyropseudaconine.

On complete hydrolysis with alkali, pseudaconitine yields, in addition to the dimethylprotocatechuic acid observed by Wright and Luff, a molecular proportion of acetic acid, which was identified and estimated in the manner described in the authors' previous paper on aconitine.

When pseudaconitine sulphate is heated in a closed tube with water it suffers, like aconitine, partial hydrolysis, the acetyl group alone being eliminated, producing a molecular proportion of acetic acid. In this action, a new alkaloid is formed, corresponding with the benzaconine derived in a similar manner from aconitine, which the authors propose to name veratrylpseudaconine. This substance is a crystalline base (m. p. 181°) which, when hydrolysed, furnishes pseudaconine and dimethylprotocatechuic acid (veratic acid).

There is, therefore, a close resemblance between the constitution of aconitine, and of pseudaconitine, both alkaloids undergoing hydrolysis in a similar manner. The molecule of each alkaioid contains an acetyl group, but in pseudaconitine the benzoyl group of aconitine is replaced by the veratryl group, aconitine being acetylbenzaconine, and pseudaconitine, acetylveratrylpseudaconine. As far as the authors' investigation has proceeded, pseudaconine appears to be distinctly different from the aconine derived from aconitine. There is little reason at present to doubt that the crystalline highly active alkaloid isolated by the authors is identical with Wright's pseudaconitine, but further evidence on this point is being obtained.—*Proceedings of the Chemical Society.*

THE OXIMES OF BENZALDEHYDE AND THEIR DERIVATIVES.

BY C. M. LUXMOORE, B. Sc

The paper contains an account of experiments undertaken with a view to throwing further light on the isomerism of the aromatic aldoximes. As already mentioned in a preliminary note by Prof. Dunstan and the author (*Proc.*, 1893, 253), in examining the mechanism of the change of benzantialdoxime into benzsynaldoxime by hydrogen chloride, the previously unknown benzantialdoxime hydrochloride has been isolated; on solution it is converted into the syn-hydrochloride. The two isomeric sulphates have also been prepared. Since the change of the antioxime into its isomeride is also preceded by the formation of a derivative of the former, which then passes into the more stable synderivative, a stereo-chemical explanation of the isomerism is rendered probable.

By the action of methyl bromide on bensantialdoxime the hydro-bromide of its "nitrogen" methyl ether is produced (m. p. 69°). This ether yields the same products of hydrolysis and reduction as the "nitrogen" methyl ether obtained from bensynaldoxime. It differs from the latter in its lower melting point and in the extreme readiness with which it is hydrolysed. The hydrobromide is stable, but the ether itself rapidly passes on standing into the isomeric syn-nitrogen ether. Structural formulae are insufficient to explain the existence of the four isomeric ethers (two "oxygen" and two "nitrogen"), which are known. Probably, therefore, the aldoximes themselves are stereo-isomeric; but both act tautomerically, and the synaldoxime reacts more readily in the sense of the isoximido formula than the antialdoxime does.

Treated with phosphorous pentachloride both oximes yield a little formanilide, but chiefly benzonitrile. Phosphorous trichloride converts benzantialdoxime into an extremely unstable chlorine derivative; with benzsynaldoxime it yields benzonitrile and hydrogen chloride instantaneously.

Almost all the stereochemical hypotheses equally well explain the isomerism of oximido-compounds of triad nitrogen; but in the case of derivatives with pentad nitrogen, Pickering's theory is more in accordance with facts than any other.—*Proc. of the Chem. So.—Br. Col. Dr.*

Synthetic Production of Alcohol.—The possibility of preparing acetylene on a manufacturing scale from calcium carbide has given additional importance to the production of alcohol from acetylene. Kruger (*Phar. Cent.*) has tested several of the methods which have been proposed with that object, and found that most of them gave negative results. Caro has since confirmed his observations, and has, at the same time, devised a method of producing alcohol from acetylene, which may perhape eventually lead to the desired results. By passing acetylene through concentrated hydriodic acid he obtained the compound CH_3CHI_2 to the extent of from 55 to 58 per cent. By boiling this product with concentrated potash solution it is partly converted into acetylene and partly into alcohol and potassium acetate, according to the following equations:

$$\left.\begin{matrix} CH_3CHI_2 \\ 2KOH \end{matrix}\right\} = \left\{\begin{matrix} 2KI + 2H_2O \\ CH \equiv CH \end{matrix}\right.$$

$$\left.\begin{matrix} CH_3CHI_2 \\ 2KOH \end{matrix}\right\} = \left\{\begin{matrix} 2KI \\ CH_3CH{<}^{OH}_{OH} \end{matrix}\right.$$

$$CH_3CH{<}^{OH}_{OH} = CH_3COH + H_2O$$

$$\left.\begin{matrix} 2CH_3COH \\ KOH \end{matrix}\right\} = \left\{\begin{matrix} CH_3COOK \\ CH_3CH_2OH \end{matrix}\right.$$

By saponifying the di iodide with moist argentic oxide the reproduction of acetylene is very small, and on boiling with caustic potash the alcohol and potassium acetate formed amount together to nearly 90 per cent.

The di-iodide is also saponified when heated with water to 140° of 150° C., a mixture of aldehyde, ethyl iodide, hydriodic acid, and unaltered di-iodide being formed. The formation of aldehyde takes place according to the equation

$$\left.\begin{matrix} CH_3CHI_2 \\ H_2O \end{matrix}\right\} = \left\{\begin{matrix} 2HI \\ CH_3CHO \end{matrix}\right.$$

By reduction of the aldehyde, alcohol would be obtained. In Caro's experiments 40 per cent. of aldehyde was obtained, and if the hydriodic acid formed were continuously removed the yield of aldehyde would probably be increased, as the reproduction of di-iodide according to the following equation would then be prevented:

$$\left.\begin{matrix} CH_3CHI_2 \\ 2HI \end{matrix}\right\} = \left\{\begin{matrix} CH_3CHI_2 \\ H_2O \end{matrix}\right.$$

On a small scale that has been effected by heating the di-iodide with an equivalant quantity of zinc oxide, twice as much zinc dust and water. After this mixture had been heated to 130° or 150° C. there was not much pressure in the tube, and after twice distilling the contents alcohol was obtained almost pure.—*Pharm. Jour.*

BOTANY.

PHARMACOGNOSY OF SOME RARE BARKS.

P. Brandt, of Jurjew-Dorpat, makes the pharmacognosy of a few rare barks the subject of his inaugural thesis, from which we extract the following : 1. Cortex Mimusopsis Elengi. The plant which yields this bark belongs to the Sapotaceae. The pieces of bark possess a layer of dark-gray outer bark, which has, to a great extent, dropped off. The bark itself is reddish-brown and sparely covered with white dots ; the inner surface is of a light brown color, and is composed of long fibers, studded with dark spots caused by dried milk juice. The corky layer consists of ten to fifteen rows of cubical cells, which are thickened on one side. Between these are layers of parenchymatous cells. The parenchymatous layer lying next to the cork is composed of polyhedral cells between which isolated and grouped stony cells are situated. Here are also found calcium-oxalate crystals, remnants of medullary rays, and bast-bundles. The primary bark is usually found replaced by the outer bark. In the exterior portion of the secondary bark may be seen small, isolated groups of stone cells which lie between the scattered bundles of bast-fibers. Short lactiferous ducts, with gray, granular contents, are scattered throughout the field of the microscope. 1. The medullary rays consist of two to four rows of cells. Starch granules are everywhere present in large numbers. 2. Cortex Mimusopsis hexandrae. The pieces examined were mostly flat, more rarely quilled, and covered with a thick, gray outer bark. The periderm contains alternating layers of cork and parenchymatous tissue. The former consists of thin-walled, quadratic cork-cells, the latter of parenchyma proper, stone-cells, and bast-fibers. The parenchyma is composed of polyhedral cells. Among these are seen a few stone-cells, and, in regular order, the bast-fibers. The latter appear to the unaided eye as yellowish-white dots upon the transverse section. The primary bark is replaced by the outer bark. But few stone-cells are visible in the secondary bark. The bast-bundles are tangentially arranged and contain crystals. The medullary rays are entwined. The lactiferous ducts are scattered without order, and possess a larger lumen than is the case with the bark of Mimusopsis Elengi. 3. Cortex Salvadorae persicae. The pieces of bark are mostly quilled and covered with an ash-gray, deeply fissured outer bark. The periderm contains two cork layers, an outer and an inner one, between which parenchyma, bast-bundles and stone-cells are situated. The primary bark is here also found replaced by an outer bark. The secondary bark contains bast-fibers, which are usually isolated, but sometimes irregularly grouped. The parenchyma is composed of thin-walled palisade-cells. The medullary rays are made up of two or three rows of cubical, thin-walled cells. Cribriform ducts and starch-granules were not found in this bark. 4. Cortex Micheliae Champacae. A thin, corky layer covers the quilled bark. The periderm consists of from ten to fifteen rows of cork-cells, each cell being quadratic and thickened on one side. Next to the cork lies the phellogen, which is composed of three or four rows of cells, which have, to the largest part, become stone-cells. Groups of stone-cells and cells containing crystals are quite numerous in the parenchymatous tissue. Bast-bundles appear but seldom, and then they are united into small, irregularly arranged groups. The secondary bark contains, in addition to the above, resin cells with yellowish contents. The medullary rays, which are straight, are composed of two rows of cells. Round and oval starch granules were noticeable in the medullary rays and in the parenchyma. 5. Cortex Muavi. The bark examined was in flat pieces, reddish-brown externally and brown internally. It has a horny texture and an aromatic odor. It is characterized by extensive sclerotization. The periderm is almost entirely absent. The phellogen consists of four rows of cells, which, to the greater part, have become transformed into stone-cells. In the primary bark the stone-cells often form closed rings. Bast-fibers are but little represented. In the secondary bark numerous groups of stone-cells are present, which form a mixed sclerenchymatous ring with the bast-fibers. The medullary rays wind their way between the stony cellular tissues. Groups of balsamiferous ducts are seen in the secondary bark. The alkaloid muavine appears to reside in the parenchyma, the medullary rays and the cibriform ducts. 6. Cortex Terminaliae tomentosae. This bark is covered with a thick outer bark. The periderm contains an inner and an outer corky layer, between which bast-bundles and parenchyma are situated. Stone-cells are nowhere present in this bark. In the primary bark, the parenchymatous tissue is arranged tangentially, but few bast-fibers are here present. In the secondary bark the bast-fibers have a concentric arrangement; many star-shaped crystals, often of large dimensions, are also present. Gum ducts are irregularly distributed. The medullary rays consist of one to two rows of cells. Starch granules are also present. 7. Cortex Terminaliae Catappae L. In the periderm, layers of cork alternate with parenchyma, bast-fibers, cribriform ducts and crystal cells. Stone-cells are not present. The parenchyma or the secondary bark consists of polyhedral, thin-walled cells, which contain tannin and starch. The bast-bundles are arranged in tangential rows, which are separated from each other by the medullary rays. Lactiferous ducts with granular contents are arranged in rows. The medullary rays are straight, and consist of from two to four rows of cells. This bark contains a considerable amount of starch and tannin.—*Merck's Report.*

(*To be continued.*)

Otto of Rose in Bulgaria.—I had occasion, in last year's report, to draw attention to the inaccuracy of the figures given by the custom house as representing the exportation of this article. This is again stated for 1894 as between 15,000l. and 16,000l., whereas almost the whole of the crop, a good average one of about 2,000 kilos, was exported at prices between 900 and 1,200 francs per kilo. France, Germany, the United States, and Great Britain were the principal buyers.

The adulteration to which otto of roses has always been subjected, seems hardly to have been checked by the prohibition imposed by the Government on the importation into Bulgaria of the adulterating medium, essence of geragate to Kezanlik, hence the otto which reaches the European markets in a pure state must be very small. Last summer the British Chamber of Commerce at Constantinople sent a delegate to Kezanlik, the principal otto producing centre, with a view to procuring an absolutely pure sample to serve as a standard for purposes of comparison. This gentleman, however, was obliged to return empty-handed, for he ascertained that though the otto may not be tampered with after reaching the merchants' hands, there is no means of insuring that the peasant, whose stock the latter buys up, has not already adulterated it. Supervision during distillation is no guarantee, for the ingenious peasant is in the habit of sprinkling essence of geranium over the freshly gathered roses before distillation in order to increase the yield. Congelation at a certain temperature, which is principally relied on as a test of purity, is quite fallacious.

I hear that the cultivation of the Kezanlik rose has been started with some success at Brousse, in Asia Minor, by mussulman refugees from this district.—*British Consular Report.*

PROFESSOR HUXLEY.

By the death of Professor Huxley the world has lost a man whom it could ill spare. He was one of the very few men who unite to a real capacity for original work, the impulse and the ability to bring home the results of scientific research to the popular mind. He believed that a knowledge of science, and above all of scientific method, was good for mankind; and he turned aside from studies in which he had won renown, and might have won more, in order that he might preach what he considered the gospel of science to the multitude. Some of his friends regretted this; in the interest of his fame they would have preferred that he should never have quitted the higher walks of scientific investigation; but for our own part it seems to us impossible that Huxley should have chosen his course otherwise than as he did. He had what few of the devotees of pure science possess, strong popular sympathies, and an extremely active temperament. He could not so immerse himself in the minutiæ of anatomy, or the obscurities of physiological processes as to be indifferent to what was going on in the world around him. He was interested in fishes and reptiles, but he was more interested in his fellow-men; and it would be difficult to overestimate the value of the service he rendered in promoting sound habits of thought in this generation. Having won complete intellectual emancipation from himself he desired that others should share the same benefit; and wherever the cause of intellectual liberty seemed to be in danger, there he was ready to come forward in its defense.

No one could read a page of Professor Huxley's writings without being struck with the breadth of culture they displayed. He was not a university bred man, and yet in his knowledge of literature and philosophy—to say nothing of his strictly scientific attainments—he put the vast majority of university men to shame. His culture, however, was never merely on exhibition as culture; it was employed in the most legitimate manner to strengthen the causes he had at heart. There was in him too broad a humanity and too much of earnest purpose to permit him to lapse into the arts of the rhetorician. Not often, indeed, has such a combination of gifts been seen in one writer; and, now that he has gone from us, it is a supreme satisfaction to reflect how nobly these gifts were used, how sincerely and courageously and untiringly they were devoted to the good of mankind.

The world is poorer by the death of Huxley; but the greatest must pass, sooner or later, from the stage of existence, and, as they pass, the lesson of their lives comes out with greater distinctness. Of Huxley we may truly say that he enriched the life of our time by his thought and his example, and that the forces which to day make for progress in the world are better organized for victory, and move forward with steadier hope, through the help and aspiration which he afforded.—*The Popular Science Monthly*.

A NEW METHOD OF MAKING LANTERN SLIDES.

BY E. W. SCRIPTURE, Yale University.

In lecturing on experimental psychology I have found it useful to project on the screen numerous views from the illustrations in my book, "Thinking, Feeling, Doing." I prepared the slides at considerable expense, in the usual way, by photography, but it finally occurred to me that it might be possible to print directly on glass from the blocks used in the book.

The electrotypes were obtained and a glass printer in a clock factory was found to do the work. After several experiments the correct method was established.

The metal portion of the cut is mounted on a board of a thickness suited to the particular frame used in the printing.

It is inked with a fine ink, tempered to the proper consistency with Calcutta boiled oil and Japan drier. The precise degree of temper depends on temperature, humidity, and other conditions.

The inking is done by a simple hand roller, of the kind used in ordinary printing.

The block lies face upward on the table, and the piece of plain glass is placed at the appropriate distance on a level with it. A composition roller of glue and molasses, made a trifle harder than the regular printers' roller, is then run forward on two guides. As it passes over the block it takes the impression. On reaching the glass, after one complete revolution, it transfers the ink impression directly to it. I do not think it possible to run this roller evenly enough without the steel guides ; at any rate, it would not pay to waste time in trying it.

The result is a print on the glass just as if on paper. Curiously enough, the prints on the glass are superior to those on paper from the same block. The positives are then finished up as lantern slides in the usual way.

The superiority of the process lies in its great cheapness. Ordinary slides never cost less than fifty cents each. Prepared in my way the first slide costs about seventy-five eents, but the future slides from the same block do not cost over five cents each.

The possibilities of the method are extensive. The publisher of an illustrated book, for example, can print off sets of slides for lecturers. Lectures on art, botany, geology, history, etc., can be provided at a small cost. Moreover, views not taken from books could be prepared by first turning them into zinc etchings, half-tones or woodcuts and then printing from the blocks. The extensive use of the lantern for purposes of instruction in the common schools is impracticable at present, mainly owing to the cost of the slides. With printed slides at a trifling cost the difficulty is removed.

People often complain that new ideas may be useful, but that, when anyone wants to put them in practice, it is difficult to find just the proper method. I have given a description that makes the method possible to every glass printer, or to anyone willing to learn by practice. Where such persons are not available, I am willing to put anyone into communication with the printer of my own slides. *Scientific American.*

American Peppermint Oil.—Power and Kleber have made a very exhaustive examination of pure oil of peppermint of American origin. A large quantity was fractionally distilled. A very small quantity came over between 30°–110°, and consisted of acetaldehyde and isovaleric aldehyde. A fairly large fraction, 155°–170°, consisted chiefly of pinene, but menthene could not be detected. From 170° phellandrene was obtained, and from 174°–177° cineol was obtained, and a tetrabromide, which was identified as that of limonene, was formed on treating a higher fraction. The fraction from 205°–209° gave menthone, and that from 209°–220° consisted of menthol. Under a pressure of 758 mm. this boiled at 215.5°. The higher boiling fractions contained menthol ester. After this was saponified menthol, and an oil distilling at 270°–280° were obtained, which was found to be candinene. The acid portion of the menthol ester freed by means of sulphuric acid and distilled with steam. Part was by this means transferred into a lactone. This had the composition $C_{10}H_{10}O2$, and is not soluble in water, but fairly so in most organic solvents. The hydroxy-acid prepared from it, $C_{10}H_{18}O_3$, crystallized in needles, melting at 9.30. Acetic and isovalerianic acids were also recognized in the products of saponification. The remainder of the paper deals with the method of estimating the menthol present by an acetylation method.—*Berichte.*

SCIENCE IN FINLAND.

Besides the National University at Helsingsfors, which had nineteen hundred and twenty-nine students in 1894, with the number increasing regularly, Finland has several scientific and other learned societies. The Finnish Society of Sciences, founded in 1838, has published, besides its regular volume of transactions, a series of works on nature, ethnography, and statistics of the country. Among its later achievements is the foundation of a central meteorological institute, which is assisted by the government. It has, besides, taken part in a number of international polar expeditions, and has established a station at Sodankyla, in Lapland. Other societies are the Natural History Society (*Societus pro faunâ et florâ fennicâ*), founded 1821; the Society of Finnish Literature, the Finno - Ugrian Society, the Finland Historical Society, the Finnish Archaeological Society, two geographical societies, a medical society and a legal society. Among Finlanders distinguished in science and letters have been Lönnrot, grammarian and collector of the national literature , Ahlqvet, another able grammarian ; Hallstrom, physicist ; the illustrious astronomer Argeländer ; the mathematicians Lindelof, Schulten and Mittag-Löffler, the last editor of the international journal *Acta Mathematica ;* the explorer Nordenskiöld, who removed to Sweden in 1857 to escape trouble on account of an address he had made at a students' festival ; the botanist Nylander ; the zoologist Nordmann ; and the surgeon Estlander. Swedish literature is also distinguished by several Finnish names of great writers ; Finnish literature is very ancient, although it has only recently begun to receive special attention. The later poets and romancers have discussed in the fresh and spontaneous old poetry of the ancient folklore, a nearly inexhaustible mine of rich images and striking epics. Finland has further produced eminent artists in various lines. The full story of the achievements of this too little known country of the far north is told in the book "La Finlands au XIX siècl," which the writers and artists of the country have combined to make up, published at Helsingfors, in French, in 1894.—*The Popular Science Monthly.*

THE EVOLUTION OF THE PHYSICIAN AND SURGEON.

Mr. Herbert Spencer, in his study of "Professional Institutions" from the evolution point of view, in the June number of the *Contemporary*, is not complimentary to the modern physician or surgeon, whom he regards as the lineal descendant of the medicine man of savage races. "The continuity of belief and of usage," he observes, "is even still shown in the surving interpretation of certain diseases by the Church and its adherents ; and it is even still traceable in certain modes of medical treatment, and certain popular convictions connected with them. The notion that the demon who was causing a disease must be driven out, continued, until recent times, to give a character to medical practice, and even now influences the conceptions which many people form of medicines. The primitive medicine-man, thinking to make the body an intolerable habitat for the demon, exposed his patient to this or that kind of alarming, painful or disgusting treatment. He made before him dreadful noises and fearful grimaces, or subjected him to an almost unbearable heat, or produced under his nose atrocious stenches, or made him swallow the most abominable substances he could think of. Not only during mediæval days, but in far more recent days, the efficiency of medicines was associated in thought with their disgustingness; the more repulsive they were, the more effectual. Hence Montaigne's ridicule of the monstrous compounds used by doctors in his day—'dung of elephant, the left foot of a tortoise, liver of a mole, powdered excrement of rat,' etc. Hence 'the belief that epilepsy may be cured by drinking water out of the skull of a suicide or by tasting the blood of a murderer;' that 'moss growing on a human skull, if dried, powdered, and taken as snuff, will cure the headache;' and that the halter and chips from the gibbet on which malefactors have been executed or exposed have medicinal properties. And there prevails in our own days, among the uncultured and the young, a similarly derived notion. They betray an ingrained mental association between the nastiness of a medicine and its efficiency: so much so, indeed, that a medicine which is pleasant is with difficulty believed to be a medicine."—*Br. Col. Dr.*

NEW OFFICERS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

The forty-third annual meeting of the American Pharmaceutical Association completed its most important work at Denver, Col., August 16. The following officers were elected: President, Prof. J. M. Good, of St. Louis, Mo.; Vice-Presidents, Charles E. Dohme, of Baltimore, Md., A. Brandenberger, of Jefferson City, Mo., Mrs. M. O. Miner, Hiawatha, Kan.; Treasurer, S. A. D. Sheppard, Boston, Mass.; Secretary, Charles Caspari, Jr.; Members of the Council, George L. Hechler, of Cleveland, O., Charles M. Ford, of Denver, Col., W. J. M. Gordon, of Cincinnati, O., and Jacob Bergheim, of Houston, Tex.

The next meeting of the Association will be held in Montreal, August 12, 1896.

NOTES HERE AND THERE.

Photographing in Colors.—An important paper on the theory of color photography is contributed to No. 6 of *Wiedemann's Annalen* by Herr Otto Wiener. The paper deals with the methods of attacking this problem, which are based not upon the photography of the different constituents of colored light and their subsequent recognition, like Mr. Ives's heliochromy and similar processes, but upon the direct production of color by the influence of light upon certain chemical substances. The most recent, and, in a way, the most successful, of these methods is that due to Lippman, and the question raised by Herr Wiener is whether the old processes invented by Becquerel, Seebeck and Poiteven are based upon interference colors like Lippmann's or upon "body colors," *i. e.*, colors produced by partial absorption of the incident light. That Lippmann's colors are due to interference may be very simply proved by breathing upon a plate with a photograph of the spectrum, when the colors quickly wander toward the violet end, this result being due to an increase in the distance between the model layers. This experiment cannot be applied to a spectrum photographed by Becquerel's method. But Herr Wiener succeeded, by a simple and ingenious contrivance, altering the path of the rays through the colored film by placing a rectangular prism on the plate, with its hypothenuse surface in contact with the spectrum. This experiment had the startling result that that part of the spectrum covered by the prism appeared strongly displaced toward the red. Hence Zenker's theory of Bacquerel's process, enunciated in 1868, which ascribed the colors to interference is substantiated. Instead of Bacquerel's homegeneous sheet of silver chloride containing subchloride, Seebeck used the powder, and Poitevin mounted the salt on paper. In these two processes the effect described is not observed. Hence these colors are body color in these two cases. The production of these body colors is a very mysterious process, but the author hopes that here will eventually be found, a satisfactory solution of the problem. To account for the production of these colors he advances a remarkable theory, which has a well-known analogy in comparative physiology. Given a collection of compounds of silver chloride and subchloride of indefinite proportions, such as those which Mr. Carey Lea calls by the collective name of "photochloride," we must suppose, according to the modern kinetic theories, that they are undergoing a rapid series of successive modifications. When the red combination happens to be exposed to red light it reflects it without absorption; and will, therefore, no longer be affected or changed by it. Similarly for the other cases. This is another process of "adaptation." The author describes some experiments which prove that this is the true explanation, and points out the importance of this view not only for color photography, but for the production of colors in the animal world.—*Nature.*

Argon.—Messrs. Phillips, Bedson and Saville Shaw have ascertained the presence of argon in the gases contained in the brine from wells sunk in the rock salt deposits on the north bank of the Tees, in the neighborhood of Middlesborough to the extent of 1.24 per cent.—*Bri. Col. Dr.*

Academical Honor.—The French Academy has elected Professor Cohn, of Breslau, the well known botanist, whose system of classification of the schizophytes is so well known, as a corresponding member.

Report on Opium—The opium commission, appointed long ago by the British Government, was charged with the investigation of three questions: Whether opium, when taken in moderation, is injurious; whether Indian opinion is opposed to its use; and whether prohibition is a practicable policy. The commission has published its report, and declares that, by a vote of eight to one it answers all the three questions in the negative. The commission finds that an immense number of doctors in India believe opium to be less injurious than alcohol. Witnesses drawn from every grade and class testified that it is an excellent remedy against malarial fever; that it can be and is consumed in moderation all through life; and that its effect upon the constitution in health is practically *nil.* Among natives the belief in the value of the drug is nearly universal.. The practice of opium eating pervades every class, is considered allowable by every class, and the people are opposed to prohibition. The commission, therefore, though they believe some improvement in the restrictive laws may be possible, refuse to suggest any, and advise substantially that the present system be left alone.—*The Popular Science Monthly.*

Molasses Pavements.—Perhaps the oddest pavement ever laid is one just completed at Chino, Cal. It is made mostly of molasses, and if it proves all of the success claimed for it, it may point a way for the sugar planters of the South to profitably dispose of the millions of gallons of useless molasses which they are said to have on hand. The head chemist of a sugar factory at Chino, Mr. E. Turke, was led to make certain experiments, of which the new sidewalk, a thousand feet long, from the factory to the main street, is the result. The molasses used is a refuse product, hitherto believed to be of no value. It is simply mixed with a certain kind of sand to about the consistency of asphalt, and laid like an asphalt pavement. The composition dries quickly and becomes quite hard, and remains so. The peculiar point of it is that the sun only makes it drier and harder, instead of softening it, as might be expected. A block of the composition, two feet long, a foot wide, and one inch thick, was submitted to severe tests and stood them well. Laid with an inch or so of its edges resting on supports, it withstood repeated blows of a machine hammer without showing any effects of cracking or bending.—*Scientific Amer.*

The Kola Nut in Jamaica.—The U. S. Consul at Kingston, Jamaica, reports that the climate and soil of the island are adapted to raising the kola nut. Very little attention, however, has been paid to its cultivation until the last few years; but, in consequence of the attention of planters being called to it by the directors of public gardens, and a demand having sprung up for it in the United States, a great number of young trees have been recently planted, and more attention is now paid to its cultivation than ever before. The exact acreage under cultivation could not be ascertained, but it is estimated that this year's crop will not exceed ten to twelve tons. In the course of four or five years, a crop of forty to fifty tons is looked for. The gathering of the crop begins about the end of May and lasts four or five months.

M. Henri Moissan has recently obtained pure fused Molybdenum by means of the electric furnace. Its density is 9.01, and it is as malleable as iron, and capable of being forged. It forms a steel by cementation, much harder than the pure metal, when heated in contact with carbon.

Its use has been suggested in place of Manganese in the Bessemer process, as any excess of metal remaining in the iron would be as malleable as the iron itself, and would allow of being tempered.

Survival of the Fittest.—Attention has been called, says the *Engineering and Mining Journal*, to the disastrous results, both direct and indirect, of the enormous inroads of electricity in street railway traffic, displacing horses, and to a lesser degree in mine haulage replacing mules. The effect on the farmers who raise horses and mules, and the grain necessary for their subsistence, and on the railways which transport this grain, is looked at as a very serious matter. As is usually the case, however, the favorable balance is more than maintained by increased activity in other lines, due directly to the same causes. The production of copper, for instance, is enormously increased by the demands of the manufacturers of electric apparatus and its transportation, together with the carrying of the finished products, makes an enormous freight tonnage. The auxiliary lines, so to speak, such as mica mining, asbestos mining, iron mining, and the metallurgical processes producing iron, steel and copper, have all received their share of the impetus due to electrical development. So, while the farmer may suffer in furnishing the supplies for horses and breeders, still he would gain in the general growth of industry requiring more men and more material of various kinds. Every improvement hastens the death of some industry unfit to survive, while it creates many new wants and increases the general prosperity.—*The Electrical World.*

New Astronomer at Lick.—Professor William J. Hussey, of Standard University, Illinois, will succeed Professor Barnard as astronomer at Lick Observatory. The appointment of Barnard's successor comes within the province of the regents of the university.

Provision is made in the Missouri Botanic Garden for the furtherance of advanced research in botany and cognate sciences, and facilities are freely given to professors of botany and other persons wishing and competent to perform such work. The garden is rich in native and exotic species of plants and horticulturists' varieties under cultivation. The herbarium includes nearly two hundred and fifty thousand species, fairly representative of the vegetable life of Europe and the United States with specimens from other regions, and is supplemented by a large collection of woods; and the library is representative of the present condition of the science in its various departments, and contains besides nearly five hundred botanical volumes prepared before the period of Linnæus. Botanists wishing to pursue their studies here are invited to communicate on the subject with Prof William Trelease, director, St. Louis.—*The Popular Science Monthly.*

According to Dr. Dupont, a physician of Paris, writing in the *Annales d'Hygiene Publique*, a safe and effective method of purifying water by chemical action has been discovered. Dr. Dupont notes that hitherto the methods of purifying drinking water have been by filtration and by the action of heat. Filtration is the oldest and least effective method. Even filtration through porous porcelain, the most effective substance known, cannot always be trusted, especially after the apparatus has been long in use. Dr. Dupont does not assert that boiling fails to destroy noxious germs, but he says that it often leaves in the water organic matter that might be dangerous to health, and that boiling makes water less digestible by robbing it of its gases. He instances a case in which water from the Seine has been found, after boiling, to contain more microbes than before.

M. Girard, director of the Municipal Laboratory of Paris, and Dr. Bordas, a pupil of Prof. Brouardel, have recently presented to the Academy of Sciences, through the chemist Friedel, a communication on the purification of water by chemical action. The chemicals used are permanganate of lime and binoxide of manganese. The permanganate of lime, coming in contact with organic matter and micro-organisms, destroys them and decomposes itself into oxygen, oxide of manganese and lime. Then, to carry off the surplus of permanganate and complete the purification, the water is poured over binoxide of manganese. Oxygen in the nascent state is thus freed, and it burns up any remaining germs. There remains then in the apparatus inferior oxides of manganese, which hasten to reoxidize themselves and furnish again a certain quantity of binoxide of manganese. The water, as thus finally purified, contains a little lime in the form of a bicarbonate and traces of oxygenated water.

A very small quantity of permanganate of lime is used for this process. Not more than 1.3 grains Troy to about a quart of water taken from the Seine at a point near Paris resulted in the production of perfectly pure water, as wholesome as spring water. Dr. Dupont says that if the process can be made successful on a large scale the question of purifying water is settled. Water containing 100,000 colonies of microbes per cubic centimetre can thus be purified, and ice placed in water with permanganate of lime is also quickly sterilized.

Milk Sold by the Plug.—Canada's representative in Denmark reports that during the past year a new industry has been established there which promises to prove both profitable and serviceable, and which might be followed with equal success on this side of the water, says viz., the shipment of frozen milk to large cities. A year ago a Danish merchant experimented in this direction by taking Danish milk, which is peculiarly delicate and rich in flavor, freezing it by the use of ice and salt, and sending it in barrels by rail and steamer to London. On its arrival the milk proved to be as sweet and well tasting as if it had been just drawn from a cow in the middle of Sweden. The milk was so much in demand and proved so profitable an article of commerce that the exporter immediately took out a patent on the shipment of frozen milk from Sweden and Denmark to London. He then sold the patent to a stock company with large capital, which, on February 1 last, bought one of the largest Swedish creameries, converted it into a factory, and, having put in a special freezing apparatus, began, on May 1, the export of frozen milk in large quantities.

When the milk is received from the farmers it is Pasteurized, that is, heated to 75°C., and then immediately cooled off to about 10° C., and now the freezing is commenced. Half the milk is filled into cans and placed into a freezing apparatus, where it will be thoroughly frozen in the course of three hours. The frozen milk is then filled into barrels of pine, the only kind of wood that can be used. The barrels, however, are only half filled with the frozen milk, the balance being filled with the unfrozen milk. This way of packing has proved to be the only practical one, as part of the milk has to be frozen in order to keep the whole cold, and part has to be in a flowing state in order to get the barrels exactly full, which is necessary in order to avoid too much shaking up on the road, by which the cream would be turned into butter; the flowing mass of ice at the same time prevent the unfrozen milk in settling the cream. Milk which is treated in this way has proved to keep quite fresh for twenty-six days. Every barrel holds 1,000 pounds of milk, and twice a week there will be shipped fifty barrels, making in all about 100,000 pounds of milk a week.

The milk is shipped to Newcastle, and from there by rail to large manufacturing cities, where it is sold in the streets or in retail stores. It is reported that the patent has been bought for Ireland also at a cost of $200,000, which proves how much the stock company expects from this new enterprise.

The time may not be far away when the dairy farms of the New England and Western States may be sending, not butter and milk, but frozen milk and cream, to the large cities or both continents.

Separation of Synthetic Remedies—Lenzinger (*Ph. Post*) has examined the behavior of several new synthetic remedies when treated according to Dragendorff's shaking out method. From an acid solution he found petroleum spirit removed guaiacolbenzol, guaiacol salicylate, benzonaphthol, alphol, agathin, salacetol, methylsalol, orthocresol, paracresalol, metacresalol, benzocresalol, malakin, and thermodin, but traces only of guaiacol cinnamate and naphthol carbonate. Benzol removed salophen, pyrodin, guaiacol cinnamate, lactophenin, *B*-naphtholcarbonate, gallanol, symphorol, Na, Li, and Sr; after previous boiling with hydrochloric acid—neurodin, malakin, thermodin, and traces of analgen. Chloroform dissolved pyrodin and analgen. From ammoniacal solution petroleum spirit removed phenocoll; benzol, tolypyrine; chloroform. analgen; amylic alcohol, gallanol.—*Ph. Jr. & Trs.*

Chemistry of the Glucosides.—We noted in this column a short time ago that Emil Fischer was devoting his energies to researches on the glucosides, and predicted that good results might be expected. Already a most valuable contribution to the subject has appeared in the current number of the *Berichte*. The glucoside worked upon is amygdalin, and, as the paper is of very great importance, we give a fairly full account of it. It was well known that amygdalin split up, under the influence of emulsin, into benzoic aldehyde (oil of almonds), hydrocyanic acid, and sugar, and from a knowledge of these facts, and the conversion of the glucoside into mandelic and amygdalic acid, caused Schiff to regard it as a compound of bensaldehydecyanhydrin with a dissaccharide, whose structural formula was:

$$\begin{array}{l} C_6H_5.\ CH.\ CN. \\ \qquad\quad | \\ \qquad\quad O.C_6H_7O\ (OH)_3.O.C_6H_7\ (OH)_3O. \end{array}$$

Fischer, however, regards the interpretation of the constitution of the saccharine residue as incorrect or incomplete. He considers that amygdalin is a derivative of maltose, or a similarly constituted diglucose. This opinion is supported by the fact that, with the help of the yeast ferment, half the sugar can be split off as glucose without the nitrogenous part of the molecule being at all affected. A new glucoside is thus produced very similar to amygdalin of the formula:

$$\begin{array}{l} C_6H_5.\ CH.\ CH \\ \quad\quad\ \ | \\ \quad\quad\ O.\ C_6H_{11}O_5 \end{array}$$

He calls this glucoside "amygdonitrile glucoside." It closely resembles amygdalin in chemical behavior, but differs very much in physical properties. To prepare it, 10 grms. of finely powdered amygdalin are mixed with 90cc. of a solution, in which 1 part of well washed and air-dried brewers' yeast is mixed with 20 parts of water and kept at 35° for 20 hours. To prevent secondary fermentation reactions .8 grammes toluol is added. The mixture is then kept in an incubator at 35° for a week. The details of purification must be left for reference to the original paper (*Ber.* xxviii. 1511). The pure glucoside begins to decompose at 140°, and is completely melted at 147° to 149°. Its specific rotation is

$$[a]_{d}^{20^\circ} = -26.9$$

It has a bitter taste, much stronger than amygdalin; it is easily soluble in cold water, alcohol, and acetone, and can thus be easily separated from amygdalin. It dissolves in 20 parts of hot acetic ether and in 2.000 parts of chloroform, which forms a useful menstruum to re-crystallize it from. Fehling's solution is not altered by it. Emulsin rapidly decomposes it into benzoic aldehyde, hydrocyanic acid and one molecule of glucose.—*Br. Col. Dr.*, Aug.. '95, pg. 171.

The Purity of Balsam of Copaiba.—According to Enell (*Nord. Farm. Tidskr.*), a sample of copaiba balsam is pure so long as it passes the following tests: (1) A mixture of 4 cc. of acetic ester and two drops of concentrated sulphuric acid are added to six or eight drops of the sample; no red or violet color should be developed in 15 minutes. If no distinct color is formed, a few drops of water are added, and the whole shaken; no red sediment should appear. (2) When heated in a porcelain capsule no odor of turpentine should be perceptible. (3) A sample should be heated carefully to 150° C., and one gramme of the residual resin is heated with 5cc. of ammonia: neither a viscous slime nor a solid mass should result, even after standing for 24 hours in a closed vessel. (4) Two parts of copaiba and one of ammonia are warmed in a test tube, The mixture should be clear, even after cooling on ice for 15 minutes.—*Apotheker Zeitung.*

PLANT CONSTITUENTS.

BY HENRY KRÆMER, Ph. G.

The formation and localization of the different plant constituents, their relation to each other and their functions in the vegetable economy have been subject to much thought and experiment, and at the same time, of some rather absurd speculation. It is of the highest practical importance to us all that the constituents of the plants be determined and that their localization, formation and functions be perfectly understood. Plant chemists have been at work a great many years with their analyses, and botanists are now ascertaining to some extent, by means of the microscope, in what portions of the plant the various constituents are contained. At the same time plant physiologists have been endeavoring to determine the elements necessary as food for the plant and their influence in the formation and transformation of food and tissues.

At the outset of the discussion of this subject, we must understand that there are two great schools of plant physiologists, which are distinguished from each other, principally by their methods of work. The one originated by Sachs when his text-book was written, and his views are to-day quite closely followed by nearly all writers of text-books embracing this subject. In this school there is much speculation and conjecture; there are many who express the hope of being able to trace the courses of the changes connected with "plant metabolism" in such a manner as to prove by actual weight and measurement the great principle of the conservation of energy. We find quite a number of authors of great abilities who have tried to give some hypotheses which might explain the exact nature of the changes by which the rhythm, of destructive and constructive metabolism is kept up in the living processes of the plant. The recent investigations of Rayleigh and Ramsay have shown how the physicist and chemist are able to carry on their investigations to an almost incredible degree of exactness. Thus far the botanist, however, has tried in vain to produce any device whereby such accurate quantative results might be obtained. The reason for this this difficulty is apparent because of the marked difference between the sciences, for in the work of the botanist there is the factor of "vital force" which produces changing conditions, new and different products resulting while the experimenter is at work.

There is another school, a small one, it is true, but one which is likened to the "thunder of the gods"—it is the school of Schwendener. He and his disciples claim that our knowledge, at best, is but meagre, and that our means of acquiring more information are still too inadequate to warrant the hope that we can obtain any final or even satisfactory answers to questions in which plant life is concerned.

The analyses of plants show that their proximate principles consist of inorganic constituents as well as carbon compounds. The number of inorganic compounds is limited, whereas the number of organic compounds is exceedingly great, and, furthermore, the quantity of the latter would in all cases (with few exceptions), far exceed the mineral matter. The quantity of ash remaining from the incinerated plant varies from 1.5 or 2.0 per cent. (as in wheat flour) to 18 or even 28 per cent. (in tobacco), and in rare cases like Chara fœtida it attains 70 per cent. The leaves contain more inorganic matter than stems, the rind contains more than the wood, and the epidermis of stems and leaves contains more than the internal tissue. We find, however, that there is inorganic matter in every plant, in every organ, and indeed in every cell. The following salts are necessary to the life of the plant: KNO_3, $Ca_3(PO_4)_2$, $MgSO_4$, $CaSO_4$ and $FeSO_4$ (in green plants). In a large number of plants there is also SiO_2, Na and Cl, while in still others there are Mn, I, Br, Fl, Li, Sr, Ba, Rb, Al, Cu, Pb, Ag, As, Zn, Ni and Co. Some of these elements are combined with carbon compounds forming double compounds, as in the aleurone grain and others are present in inorganic combinations.

The carbon compounds upon elementary analysis are found to consist of but very few elements; viz.;—C, H, O, N, P and S. These elements are, however, so combined in the plant, forming the tissues and food, that in many cases the molecules exhibit an exceedingly complex arrangement. They are combined in the plant forming the following classes of compounds; I. *Plastids*, consisting of (1) *Chloroplastids*, as the chlorophyll grains in green plants; (2) *Leucoplastids*, or starch generators, found in rhizomes and (3) *Chromoplastids*, or the color granules of fruits and flowers. II. *Carbohydrates* which include: (1) *Monosaccharides* or glycoses, as dextrose ($C_6H_{10}O_5$); (2) *Disaccharides* or saccharoses, as cane sugar ($C_{12}H_{22}O_{11}$); (3) *Polysaccharides*, being (a) crystallizable as raffinose $C_{36}H_{64}O_{32}+10\ H_2O$) and (b) uncrystallizable or colloidal, and of the general formula $(C_6H_{10}O_6)_n \pm (H_2O)_n$. To this latter group belongs starch, lichenin, inulin, the sacchorocolloids like gum arabic, cerasin, bassorin, cellulose and also the vegetable jellies (pectin bodies). (4) A group of bodies related to the glycoses, as arabinose ($C_6H_{10}O_6$), quercin ($C_6H_{12}O_6$), quercite ($C_6H_{12}O_5$), mannite ($C_6H_{14}O_6$). III. *Protoplasm*, which consists of a mixture of substances called proteids. IV. *Proteids*, which consist of (1) *Plastin* (C, H, O, N, S, P.), being considered the organized proteid of the cell; and (2) *Globulins* and *Peptones* (C, H, O, N, S) which are the unorganized, proteid matter and include albumin, globulin, fibrin and casein, which latter yields glutin. V. *Ethereal Oils*, which consist of (1) *Hydrocarbons*, as isoprene (C_5H_8), terpenes ($C_{10}H_{16}$), cubebene ($C_{15}H_{24}$), colophene ($C_{20}H_{24}$), gutta percha ($(C_{10}H_{16})_n$); (2) *Camphors*, as Japan camphor ($C_{10}H_{16}O$), borneol ($C_{10}H_{18}O$), menthol ($C_{10}H_{20}O$); (3) *Aldehydes*, as cinnamic aldehyde in oil of cinnamon (C_9H_8O); (4) *Ketones*, as methyl-nonyl ketone ($C_{11}H_{22}O$) in oil of rue; (5) *Ethers*, as anethol in oil of anise ($C_{10}H_{12}O$), (6) some contain sulphur, as allyl isosulphocyanide in volatile oil of mustard (C_3H_5NCS); (7) some contain HCN, as bitter oil of almond. VI. *Fixed Oils* include the following groups: (1) *Non-Drying Oils*, as olive; (2) *Drying Oils*, as linseed; (3) *Cottonseed Oil Group;* (4) *Castor Oil Group.* VII. *Solid Vegetable Fats*, as cacao butter. VIII. *Waxes* contained in the bloom of fruits, as in species of Myrica and Rhus and in the cuticularized epidermis of some plants, as upon the bark of *Fouquieria splendens* and leaf buds of the carnauba palm. IX. *Tannins* are most satisfactorily considered as (1) *Pathological Tannins*, like gallotannic acid and (2) *Physiological Tannins*, which are produced in all plants and on decomposition yield either glucose or coloring matters, as quercitannic acid. X. *Coloring Principles*, as carthamnin ($C_{14}H_{16}O_7$). XI. *Neutral Principles* like santonin ($C_{15}H_{18}O_3$). XII. *Bitter Principles*, as absinthin ($C_{40}H_{58}O_9$.) XIII. *Alkaloids* including principles of the following constitution: (1) *Pyridin Derivatives*, as coniine ($C_8H_{17}N$), nicotine ($C_{10}H_{14}N_2$); (2) *Chinolin Derivatives*, as papaverine ($C_{20}H_{21}NO_4$); hydrastine ($C_{21}H_{21}NO_6$); (3) *Uric Acid Derivatives*, as caffeine ($C_8H_{10}N_4O_2$), theobromine ($C_7H_8N_4O_2$). XIV. *Glycosides* or glucosides classified according to their decomposition products, as: (1) *Glycosides*, in the restricted sense, as exemplified by salicin ($C_{13}H_{18}O_7$) jalapin ($C_{34}H_{56}O_{16}$), daphnin ($C_{31}H_{34}O_{19}$); (2) *Phloroglucides*, as phloretin ($C_{15}H_{14}O_5$); (3) *Phloroglycosides*, as phloridzin ($C_{21}H_{24}O_{10}$); (4) *Mannides*, as quercitrin ($C_{32}H_{88}O_{20}$); (5) *Nitrogenous Glycosides*, as amygdalin ($C_{20}H_{27}NO_{11}$), solanine ($C_{42}H_{87}NO_{15}$). —(*From "The Apothecary"*)

(To be Continued).

Alumni Notes.

'93 NOTES.

FORGOTTEN is Trilby, in oblivion is Little Billee, even Boreas blows no more through Svengalli's beautiful whiskers.

Roosevelt, his teeth (what an "ad" for tooth powder) and Sunday beer, these are the questions. Even the pharmaceutian professor begins to talk of closing the business on Sunday during certain hours, if (ah, that "if!") the other fellow would do it first.

CHAUNCEY TERWILIGER is with Platte, Ph. G., in Flushing, L. I. Truly it is said, "Some are born with honors, some acquire honors, upon others it are thrust.

The honor to practice (?) pharmacy in the town of Mr. O. J. Griffin, our blonde clerk of the college (who said rats!) was thrust upon Chauncey.

A. KIPP is back at Sing Sing with J. Hart.

CARL MITTENZWEIS is in business in Brooklyn. He became a subscriber to the JOURNAL lately, and says that now his happiness is complete.

It's very pleasant to know that so many of the class are doing so well.

It seems the class has shown very well in a business way, to say nothing of the many happy marriages and embryonic bridegrooms.

"I DO remember an apothecary, and hereabouts he dwells," at No. 14 North Aurora street. Ithaca, N. Y., Ira I. Hopkins, with Judson B. Todd.

MR. E. F. LOHR, returned from a two weeks' vacation, spent traveling through Niagara, Montreal, Thousand Islands, Lake George and Saratoga.

CHARLES BOLDUAN is away on a months' vacation. He is with Haas on Fifth avenue.

A. LANGE. just returned from a thirty days' fishing and hunting trip in the wilderness, "where one of the party had to sit up at night and watch for wolves and Indians," so he said himself and he ought to know.

L. JACOBSON has obtained a position in the prescription department with Hegeman & Co. (corporation).

MEETINGS of the Alumni are soon to begin, and let us hope that '93 will be well represented. If you are a member, it's your duty to come, if not, come and become a member ; come anyway.

JULIUS TANNENBAUM, Ph. G.,
116 East 116th street, city.

'94 NOTES.

THE engagement of Ex-Sec'y Linnig to Miss Lucy A. Beebee, of Brooklyn, is announced. Freddie, for some time has been acting so suspicous that we were not surprised to learn of his intentions, though we do think he acts rather mean, in leaving us old batchelors to struggle along on the same old road. But, jokes aside, with his amiable disposition, their married life should be (to use Grover's expression), "one grand sweet song."

FRANK T. SMITH. famous for the camphoraceous story, delivered during one of Dr. Rusby's quizes, is with his father, Dr. T. Smith, who conducts one of the largest wholesale and retail drug houses in Asheville, N. C. Frank is still a batchelor, but has hopes. He says his mind frequently reverts pleasantly to his old classmates of whom he expresses a desire to see again.

STEWART J. FALKNER is with Dagget and Ramsdell, on Fifth ave. After laboring for some time "Down East" he concluded that New York was the proper place after all. In an interview with an Alumni reporter, he expressed himself as satisfied with the present state of pharmaceutical affairs ; but he declined to talk politics except to say that he had found few drier towns, not excepting the celebrated temperance towns, than New York on Sunday.

T. SHERWOOD BOYD, or to use our familiar expression, "Sherry," which, by the way, was not given because of his apathy to total abstinence is with Kalish. He is said to be quite a favorite with the stamp customers, the majority of which are said to be pretty girls.

THOS. E. DAVIS, hospital steward of the Eighth Battalion, N. G., S. N. Y., spent two more weeks in State camp this summer. The battalion was reviewed by Gov. Morton, who congratulated them on their showing. He succeeded his father in business on the latter's death.

HENRY KRUEDER has returned from a trip in the Adirondacks. He is looking in good conditton for the second years' work at P. and S.

B. EDGAR DAWSON is spending his three weeks' vacation in Nova Scotia, his home. where he expects to devote some time to wheeling on a Stearn's special.

W. C. YOUNGS, who undoubtedly held the highest position (6 ft. 6 in.) in our class, and is now with the Allison Drug Co.. on Fourth ave., was the hero of a recent amusing incident. A few Sundays ago he went wheeling to Coney Island with a young lady, (sister, I think), over the cycle path they spun, little thinking of what was in store for them, after spending several hours on the beach they reluctantly started for home feeling quite fresh after their rest, when a short distance on the journey the young lady's wheel broke down, fix it they could not, and "what could the poor boy do?" Why, he had to carry both lady and wheel from Coney Island to Brooklyn.

RACE and his wheel had quite a time while on the vacation, in their last run they "struck on a snag" and fought to a finish, 'tis hard to tell who received the worst of the go, but think he came out second best. He speaks about getting his life, I mean wheel, insured.

N. Y. C. P. CYCLERS, Born, Race. Col. Wade and Kirk were at Manhattan Beach when Titus broke the 5 and 10 mile world's records. Their next run will be on Labor Day when they will leave East 23d street Ferry at 2 p. m. for the track. Unattached wheelmen are invited to participate in the run.

GREAT pictures those in the new prospectus. Did you see Brown In the Pharmacognosy scene ?

SCHUYLER'S name now adorns one of the pages. He is said to be quite proud of the honorable mention.

LIBRARIAN Davis has been succeeded by Mr. W. W. Elderkin.

DON'T forget Wednesday evening, Oct. 9th, at 8 p. m., when the Hon. Geo. F. Roesch will givs us some "pointers" '94, can and will be duly represented.

NELSON S. KIRK, Ph. G.
9 E. 59th St.

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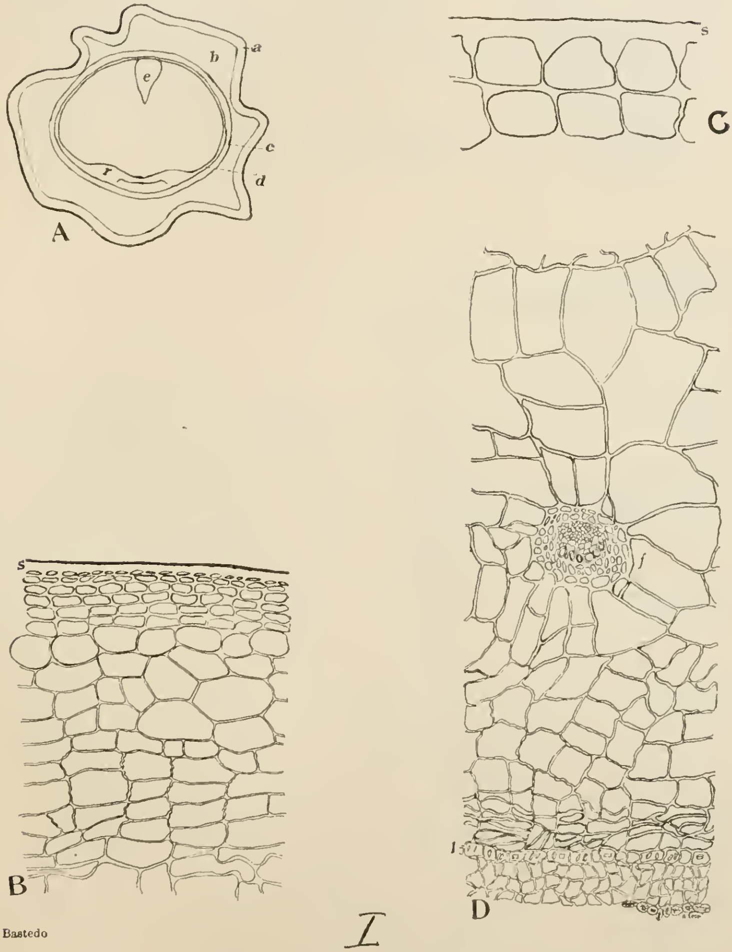
THE ALUMNI ASSOCIATION OF THE COLLEGE OF PHARMACY

. . . . OF THE CITY OF NEW YORK . . . .

THE HISTOLOGY OF SAW-PALMETTO.

By W. H. BASTEDO, Ph. G.

Illustrations of "The Pharmacology of Saw-Palmetto." July Number of the Alumni Journal.—Botany and Materia Medica by H. H. RUSBY, M. D.—Pharmacy by VIRGIL COBLENTZ, Ph. G.—Histology by W. H. BASTEDO, Ph.G.



EXPLANATION OF PLATE I.

A. Transverse section through whole fruit at embryo; *a.* epicarp; *b.* mesocarp; *c.* endocarp; *d.* seed coat; *e.* embryo; *r.* raphe.

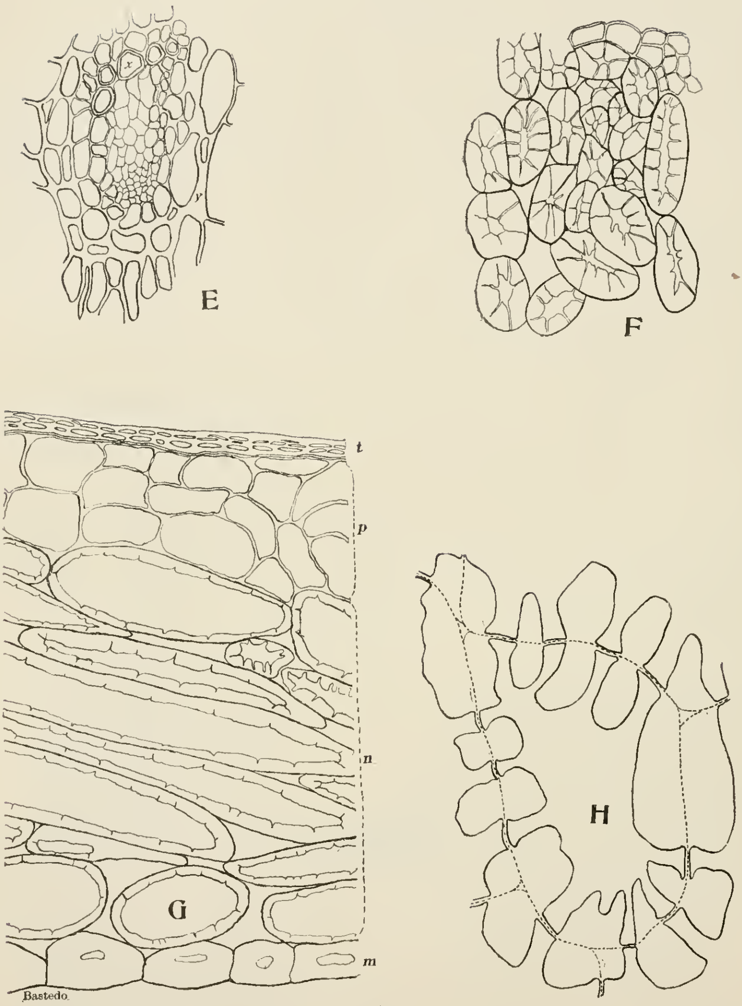
B. Transverse section of epicarp; *s.*=ext. cuticular sheath.

C. External cuticular sheath much enlarged.

D. Transverse section of mesocarp, showing fibro-vascular bundle *f*, and crystal layer *l*.

THE HISTOLOGY OF SAW-PALMETTO.

By W. H. BASTEDO, Ph. G.



II.

EXPLANATION OF PLATE II.

E. Transverse section of fibro-vascular bundle; *x*.=a duct of xylem; *y*. collenchyma surrounding bundle.

F. Transverse section of endocarp. The thin-walled cells seen on upper side attach to mesocarp.

G. Transverse section of seed-coat; *t* tegmen; *p*. non-lignified tissue of testa; *n*. lignified and pitted cells; *m*. single external uniform layer.

H. A single cell of perisperm of seed, showing irregular thickening of wall.

The Alumni Journal

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WHAT IS BARK?

BY H. H. RUSBY, M. D.

This question has recently come forward in a way which is liable to occasion some inconvenient discrepancies between usage and authority unless those who constitute our authority shall give due weight to the claims of conservatism and good practice. It is answered in two ways. The first is the practical method of framing a definition based upon the obvious structural characters in which all barks agree, without regard to their origin. This definition, for convenience of discussion, we may designate as the *practical* one. The other is by beginning at the opposite end and fixing the limits of the bark in accordance with the primary structural element which gives origin to it. This we may designate as the *morphological* definition. The former method gives us a definition which includes all those structures which have come to be recognized under the name "bark," not only in commerce and every day usage, but in literature as well. The latter gives us one which has the merit of conforming strictly to morphological principle, but which it is absolutely impossible to apply in practice. By it, to illustrate, a Calisaya "bark" taken from the tree at one age will include the whole of the bark; that taken later may contain not one particle of if, and it will be impossible in practice for any one to determine precisely when this stage has been reached.

If the growing point of any stem or root yielding commercial bark be examined in microscopical section, it will be found to consist of three portions which are readily distinguishable by slight differences in the cells respectively which compose them. The center is a solid cylindrical mass, known as the *plerom*. Surrounding this is a hollow cylinder of tissue called the *periblem*, and still outside of this a second hollow cylinder called the *dermatogen*. None of these three structures pertains to the older parts of the stem or root, because as they age they change so greatly as to lose almost entirely their original characters. It is therefore, not these three parts, but the respective structures which develop from them, which we are to find in the older parts. So far as commercial barks are concerned, we may ignore the structure (*epidermis*) resulting from the dermatogen, as it is but temporary and is torn asunder and destroyed by the pressure of the rapidly growing parts which it at first encloses. The same fate, by a somewhat different process, sometimes befalls the structure (*cortex*) developed from the periblem, while at other times it does not. If it does, say the advocates of the morphological definition, then the tree loses its bark and goes through the remainder of its existence without one and that which is peeled off from it and is used under the name of bark is not bark, because their definition limits the bark to that portion of the integument which is derived from the periblem. This we regard as a *reductio ad absurdum*, and therefore reject a definition or a construction which involves it.

To understand the sense in which the term bark is at present understood, and which agrees with our practical definition, we must consider the development and ultimate disposition of the cortex and its resulting structures and also of those of the pleron. It is clear that the original or *primary* cortex cannot continue indefinitely to enclose the central structures as they grow larger. If it do so, it must also grow, and for this purpose a cylinder, or a series of plates, of manufacturing tissues (*phellogen*) makes its appearance, usually within the limits of the cortex. The phellogen manufactures tissue from both its inner and its outer faces. That upon the inner is cortex, very similar to the primary cortex. This can receive nourishment the same as the other central tissues. That upon the outer face of the phellogen is cork, and being impervious to the nutritive juices from within, must cause by its presence the death of all tissue exterior to it. It is this form of construction which we see in the scaling of the barks of the ordinary trees and shrubs. If, as occurs in many cases, these scales falls off, it is clear that all that ultimately remains of the "bark" is the portion interior to the phellogen. If now this phellogen does not penetrate more deeply than the inner limit of the cortex, there will always be left as a covering for the tree a certain portion of bark, no matter which of the two definitions we accept. But, if, as in the case of an old Calisaya, the phellogen shall penetrate more deeply than this, then the whole of the primary cortex and its resulting structures may be lost to the tree, which shall thenceforward be covered by structures derived from the plerom. Such a tree therefore will possess a bark in accordance with our practical definition, but not in accordance with the morphological one. The confusion and misunderstanding which would arise from such a change in terminology can be only in small part appreciated from the above consideration. Let us see what other tissue besides that of corticle development is included in the bark as we use the term. Just as the cortex requires the action of a manufacturing tissue for its growth, so does the structure (*stele or central cylinder*) developing from the plerom. Such manufacturing tissue, in plants yielding commercial barks, is in the form of an extremely thin cylinder (*cambium*) originating not far from the outer boundry of the plerom. Like the phellogen, it manufactures tissue from both its inner and outer faces. That upon the inner face becomes *wood*, that upon the outer *bast*. If now we attempt to remove the bark from a tree, separation naturally occurs at the cambium, and we take away, besides the tissues derived from the periblem, if any remain, that portion derived from the pleroin which is exterior to the cambium. It is this complex structure to which the term "bark" has always, except by a few individuals, been applied. Its limit is not only that of natural and convenient separation, but is well marked as one which separates the regions of the two great classes of medicinal deposits. The corticle and bast regions, it is true, show some differences from one another in this respect, but no such sharp and fundamental a one as exists between the wood and the collective tissues which surround it.

The full awkardness of a situation resulting from the general acceptance of the morphological definition is now apparent. In purchasing Calisaya, to adhere to our original illustration, we must first ascertain whether it bear any portion of tissue of corticle origin, and if not we must call for it as Calisaya bast. If it does, we must speak of it as so much Calisaya bast and bark, or Calisaya integument, or else we must coin a new name for the structure which has always been known as bark. If the order call for Prunus Virginiana, the druggist would be forced under our existing official definition to carefully remove all the bast before supplying it.

If the term "bark" were strictly a scientific one like periderm or phelloderm, or if it were pre-eminently so used, the proposition to restrict it to a new meaning might have a basis, though even then it would in our opinion be devoid of any beneficial object at all commensurate with the trouble which such a change would occasion; but as the matter stands, even this is not the case. It is a word of common usage, of the dictionary, of an extensive commerce, and of an extensive and most important standard literature. If science desires on scientific grounds to cultivate clearer ideas on the subject of bark origin and structure, a very important desideratum for which we are all willing to work, it should do so through the coining of a new name to represent the comparatively new idea, and not introduce an unnecessary confusion by the wresting of a word of this character to a new use.

Eucalyptene.—Voiry, in the course of his investigations on oils of eucalyptus, has determined the presence of a strongly dextrorotary terpene in the oil of Eucalyptus globulus distilled in southern France. Bouchardat and Tardy have prepared a number of derivatives of this body in order to compare them with those of laevo-terebenthene. This dextrorotary terpene appears to correspond exactly with the laevo-terpene which is the main constituent of the pine product. It boils at 156°-157°, and has a specific gravity of .870 at 0°. Its optical activity is (a) d = + 39°. The principal body studied by the authors is the product of hydration. By the action of absolute formic acid, they have obtained an acoholic formate, which, when saponified, yields $C_{20}H_{18}O_2$, a body corresponding in all details to the one prepared from the laevo-terpene. It crystallizes in voluminous masses, melting at 33°-34°. It boils at 218°, and is dextrorotary (a) d = + 88°.—*Bull. de la Soc. Chim. de Paris.*

The Alkaloids of Calabar Beans.—From these beans three alkaloids have hitherto been extracted—eserine or physostigmine, eseridine, and calabarine. According to Ehrenberg, the last named does not exist already formed in the plant, but a new alkaloid was extracted which he terms eseramine. This body crystalizes in colorless needles, melting at 238°. It is almost inactive physiologically. Its formula appears to be $C_{16}H_{25}N_4O_3$. It is known that eserine, under the influence of alkalies, gives a coloring matter, rubreserine, which rapidly turns blue. If, however, alkalies be allowed to act on eserine, in the absence of air and in the cold, a new base is formed, which can be obtained in crystals by means of dry ether. Ehrenberg proposes to term this base eseroline. It has the formula $C_{13}H_{18}N_2O$; exposed to air it rapidly oxidizes to rubreserine. This body is not obtained from eseredine.—*The British and Colonial Druggist.*

THE PROGRESS OF SYNTHETICAL CHEMISTRY.

The history of chemical synthesis has been so thoroughly dealt with from time to time that I should not have ventured to obtrude any further notice of this subject upon your patience were it not for a certain point which appeared to me of sufficient interest to merit reconsideration. It is generally stated that the formation of urea from ammonium cyanate by Wöhler in 1828, was the first synthesis of an organic compound. There can be no doubt that this discovery, which attracted much attention at the time, gave a serious blow to the current conceptions of organic chemistry, because urea was so obviously a product of the living animal. It will be found, however, that about the same time Henry Hennell, of Apothecaries' Hall, had really effected the synthesis of alcohol—that is to say, had synthesized this compound in the same sense that Wöhler had synthesized urea. The history is soon told. In 1826, Hennell (through Brande) communicated a paper to the Royal Society which appears in the *Philosophical Transactions* for that year.* In studying the compounds produced by the action of sulphuric acid on alcohol, and known as the "oil of wine," he obtained sulphovinic acid, which had long been known, and gave fairly good analyses of this acid and of some of its salts, while expressing in the same paper very clear notions as to its chemical nature. Having satisfied himself that sulphovinic acid is a product of the action in question, he then proceeded to examine some sulphuric acid which had absorbed eighty times its volume of olefiant gas, and which had been placed at his disposal for this purpose by Michael Faraday. From this he also isolated sulphovinic acid. In another paper, communicated to the Royal Society in 1828,† he proves quantitatively that when sulphovinic acid is distilled with sulphuric acid and water the whole of the alcohol and sulphuric acid which united to form the sulphovinic acid are recovered. In the same paper he shows that he had very clear views as to the process of etherification. Hennell's work appears to have been somewhat dimmed by the brilliancy of his contemporaries who were laboring in the same field; but it is not too much to claim for him, after the lapse of nearly seventy years, the position of one of the pioneers of chemical synthesis. Of course, in his time the synthesis was not complete, because he did not start from inorganic materials. The olefiant gas used by Faraday had been obtained from coal gas or oil gas. Moreover, in 1826–1828 alcohol was not generally regarded as a product of vital activity, and this is, no doubt, the reason why the discovery failed to produce the same excitement as the formation of urea. But the synthesis of alcohol from ethylene had, nevertheless, been accomplished, and this hydrocarbon occupied at that time precisely the same position as ammonium cyanate. The latter salt had not then been synthesized from inorganic materials, and the formation of urea, as Schorlemmer points out ("The Rise and Development of Organic Chemistry," p. 195), was also not a complete synthesis. The reputation of Wöhler, the illustrious friend and colleague of the more illustrious Liebig, will lose not a fraction of its brilliancy by the raising of this historical question. Science recognizes no distinction of nationality, and the future historian of synthetical chemistry will not begrudge the small niche in the temple of fame to which Hennell is entitled.

*"On the Mutual Action of Sulphuric Acid and Alcohol, with Observations on the Composition and Properties of the resulting compounds," *Phil. Trans.*, 1826, p. 240.

†"On the Mutual Action of Sulphuric Acid and Alcohol, and on the Nature of the Process by which Ether is formed." *Phil. Trans.*, 1828, p. 365.

Like many other great discoveries in science, the artificial formation of natural products began, as in the case of alcohol and urea, with observations arising from experiments not primarily directed to this end. It was not until the theory of chemical structure had risen to a rank of a scientific guide that the move complicated syntheses were rendered possible by more exact methods. We justly credit structural chemistry with these triumphant achievements. In arriving at such results any defects in the theory of structure are put out of consideration because—and this point must never be lost sight of—all doubt as to the possibility of this or that atomic grouping being stable is set aside at the outset by the actual occurrence of the compound in the nature. The investigator starts with the best of all assurances. From the time of Wöhler and Hennell the course in discovery in this field has gone steadily on. The announcement of a new synthesis has ceased to produce that excitement which it did in the early days when the so-called "organic" compounds were regarded as products of a special vital force. The interest among the uninitiated now rises in proportion to the technical value of the compound. The present list of 180 odd synthetical products comprises, among the latest discoveries, gentisin, the coloring matter of the gentian root (*Gentiana lutea*), which has been prepared by Kostanecki and Tambor, and caffeine, synthesized by Emil Fischer and Lorenz Ach, starting from dimethylurea and malonic acid.

I have allowed myself no time for those prophetic flights of the imagination which writers on this subject generally indulge in. When we know more about the structure of highly complex molecules, such as starch and albumin, we shall probably be able to synthesize these compounds. It seems to me more important just at present to come to an understanding as to what is meant by an organic synthesis. There seems to be an impression among many chemists that a synthesis is only effected when a compound is built upon simpler molecules. If the simpler molecules can be formed directly from their elements, then the synthesis is considered complete. Thus urea is a complete synthetical product, because we can make hydrogen cyanide from its elements; from this we can prepare a cyanate, and finally urea. In dictionaries and text-books we find synthetical processes generally separated from modes of formation, and the latter in their turn kept distinct from methods of preparation. The distinction between formation and preparation is obviously a good one, because the latter has a practical significance for the investigator. But the experience gained in drawing up the tables of synthesized compounds, to which I have referred, has resulted in the conclusion that the terms "synthesis" and "mode of formation" have been either unnecessarily confused or kept distinct without sufficient reason, and that it is impossible now to draw a hard-and-fast line between them. Some recent writers, such for example, as Dr. Karl Elbs, in his admirable work on this subject ("Die synthetischen Darstellungsmethoden der Kohlenstoffverbindungen," Leipzig, 1889), have expanded the meaning of the word synthesis so as to compromise generally the building up of organic molecules by the combination of carbon with carbon, without reference to the circumstance whether the compound occurs as a natural product or not. But although this definition is sufficiently wide to cover the whole field of the production of carbon compounds from less complex molecules, it is in some respects too restricted, because it excludes such well-known cases as the formation of hydrogen cyanide from its elements, or of urea from ammonium cyanate. I should not consider the discussion of a mere question of terminology of sufficient importance to occupy the attention of this Section were it not a matter of principle, and that a principle of very great importance, which I believe to be associated with a clear conception of chemical synthesis. The great interest of all work in this field arises from our being able, by laboratory processes, to obtain compounds which are also manufactured in nature's laboratory--the living organism. It is in this direction that our science encroaches upon biology through physiology. Now, if we confine the notion of synthesis to the building up of molecules from simpler molecules or from atoms, we exclude one of nature's methods of producing many of these very compounds which we claim to have synthesized. There can be no manner of doubt that a large proportion, if not a majority, of the natural products which have been prepared artificially are not synthesized by the animal or plant in the sense ot building up at all. They are the results of the breaking down—of the degradation—of complex molecules into simpler ones. I urge. therefore, that if in the laboratory we can arrive at one of these products by decomposing a more complex molecule by means of suitable reagents, we have a perfect right to call this a synthesis, provided always that the more complex molecule, which gives us our compound, can be in it turn synthesized, by no matter how many steps, from its constituent atoms. Thus oxalic acid has been directly synthesized from carbon dioxide by Kolbe and Drechsel by passing this gas over potassium or sodium amalgam heated to 360°. Whether the plant makes oxalic acid directly out of carbon dioxide we cannot at present state; if it does, it certainly does not employ Kolbe and Drechsel's process. On the other hand this acid may, for all that is known, exist in the plant as a product of degradation. Many more complex acids, such as citric and tartaric, break down into oxalic acid when fused with potash. Both citric and tartaric acids can now be completely synthesized; therefore the formation of oxalic acid from these by potash fusion is a true synthesis.

The illustration given will make clear the point which I am urging. The distinction between a synthesis and a mode of formation vanishes when we can obtain a compound by the breaking down of a more complex molecule in all those cases where the latter can be completely built up. If we do not expand the meaning of synthesis so as to comprise such cases we are simply shutting the door in nature's face. It must be borne in mind that the actual yield of the compound furnished by the laboratory process does not come into consideration, because it may be generally asserted that in most cases the artificial processes are not the same as those which go in the animal or plant. The information of real value to physiologist which these syntheses give is the suggestion that such or such a compound may possibly result from the degradation of this or that antecedent compound, and not from a process of building up from simpler molecules.—*Abstract from the address of the President of the Chemical Section of the British Association at Ipswich, Prof. Raphael Meldola, F. R. S., F. I. C.*

Quinine Derivatives.—By the action of methyl iodide on crystallized quinine in alcoholic solution, the methyl iodide derivative is obtained,

$$C_{20}H_{24}N_2O_2CH_3I + 2H_2O.$$

By warming for sometime with potash, Hesse has obtained from this body methyl quinicin, $C_{20}H_{23}(CH_3)N_2O_2$, which like quinicin, forms a neutral crystalline salt with oxalic acid.—*Apotheker Zeitung.*

WHAT IS THE PURE ACONITINE OF COMMERCE?

BY ALFRED R. L. DOHME.

As the result of some experiments made some time since on the value of titration with volumetric acid solution as a means of assaying alkaloidal drugs and galenical preparations, a titration of the various well known pure alkaloids was made in order to substantiate the theory that each cubic centimeter of decinormal acid used in the titration represented so much (a quantity equal to its molecular weight) of each of these alkaloids.* Whereas this work substantiated the theory beautifully, it led to the conclusion that one at least of the alkaloids examined was either not pure or at least very prone to decomposition. This alkaloid was aconitine. As mentioned in that article, it was decided to examine more carefully the aconitines of the market and endeavor to detect if they were or were not pure substances. All the available makes of this market were procured and examined, and the results will follow below. Dr. Martin Freund, of the University of Berlin, who is now engaged in unraveling the mystery of the constitution of aconitine, and is hence perhaps the best posted man on the subject, was appealed to, and his reply intimated the possibility of a decomposition during the process of titration due to the combined action of heat and dilute acid on the alkaloid. This was not the case, however, as heat was not applied during the process of titration in case of aconitine, and in all the experiments tabulated below no heat was applied. Before discussing the results let us inquire as to what aconitine is liable to contain as contaminations. Aconite root contains the following alkaloids combined with aconitic acid :

Aconitine — $C_{34}H_{47}NO_{11}$ — rhombic tables, insoluble in water, melting point 197–198° C.

Apoaconitine — $C_{34}H_{45}NO_{10}$ — crystalline—melting point 185–186° C.

Aconine—$C_{25}H_{41}NO_9$—amorphous—melting point 130° C.

Picroaconitine and picroaconine are the same, respectively, as aconitine and aconine.

Pseudaconitine — needles — $C_{36}H_{49}NO_{12}+H_2O$ — melting point 104-105° C.

Pseudaconine—amorphous — $C_{27}H_{41}NO_9$—soluble in water—melting point unknown.

Aconitine and pseudaconitine are different, because the former yields on saponification benzoic acid and aconine, while the latter yields on saponification veratric acid (dimethyl-protocatechuic acid) and pseudaconine. Aconine, apoaconine and pseudaconine are decomposition products of the corresponding aconitines. This chapter is, however, quite dark yet and statements conflict very much, so that, as in the case of ergot, every new investigator finds a new alkaloid in the drug and gives it a new name. When Dr. Freund gets finished with this drug it is probable that we will know something definite about it. In order to be able to report upon the aconitines of the market a sample of each was procured in an original package, including the products of Messrs. Rosengarten & Sons, Powers & Weightman, Mallinckrodt Chemical Works, Merck, C. F. Boehringer & Soehne, and Duquesnel, of France. The color of these products varied from a pure white to a dark cream color, and in consistency from a flaky amorphous to a granular crystalline. They were tested as to their melting points with the following results :

I.,† melting point, 105–107° C. ; II.,

*New England Druggist, January, 1895

†These numbers have no special reference to the order in which the products are enumerated.

melting point, 180° C.; III., melting point, 91–109° C.; IV., melting point, 83–97° C.; V., melting point, 183–184° C.; VI., melting point, 195° C.

I., II., V. and VI. are hence probably made up of one substance, but III. and IV. are unquestionably a mixture of several substances. They were then titrated with decinormal sulphuric acid, 1 cc. of this being regarded as representing 0.0645 gm. of aconitine according to the formula for aconitine established by Dr. Freund, which is $C_{34}H_{47}NO_{11}$= 645. If these products were pure aconitine they should have yielded the same amount of this alkaloid as was weighed off and taken to be titrated. In no case was this found to be true, but instead the following observations were made:

I. yielded 10.06 per cent. more aconitine than was weighed off; II., 10.7 per cent.; III., 11.4 per cent.; IV., 11.3 per cent., V., 11.8 per cent.; VI., 11.4 per cent.

This indicates that in all the products there is contained some substance whose molecular weight is less than that of aconitine, and is probably hence a decomposition product of aconitine. The remaining alkaloids of aconite root are too little known to enable one to devise a reliable method of determining them or the aconitine, and as they may all be contained in the sample under examination, and may accompany the aconitine present throughout all its decompositions and changes, all methods of assay can at best be approximations until we do know more about them. Assuming that aconitine, *i. e.* acetyl-benzoyl-aconine, alone of all the aconite alkaloids is saponified into aconine, benzoic acid and acetic acid by alkalies, an attempt was made to saponify all the samples under examination by means of alcoholic potash, and then collect the benzoic acid upon a weighed filter, For each molecule of benzoic acid formed one molecule of aconitine is to be regarded as present, the calculation being—

Molecular weight benzoic acid (122): molecular weight aconitine (645):: weight in grams of acid found : weight in grams of pure aconitine present.

Knowing the amount of aconitine originally taken for assay, the percentage of pure aconitine can be determined. Thus in case of our products:

I. Aconitine taken—0.519 gm. and benzoic acid found—0.60 gm., equivalent to 61.1 per cent. pure aconitine.

II. Aconitine taken—0.791 gm. and benzoic acid found—0.095 gm., equivalent to 63.5 per cent. pure aconitine.

III. Aconitine taken—0.4365 gm. and benzoic acid found—0.063 gm., equivalent to 76 per cent. aconitine.

IV. Aconitine taken—0.398 gm. and benzoic acid found—0.058 gm., equivalent to 77 per cent. aconitine.

V. Aconitine taken—0.4135 gm. and benzoic acid found—0.068 gm., equivalent to 87 per cent. pure aconitine.

VI. Aconitine taken—0.5680 gm. and benzoic acid found—0.083 gm., equivalent to 77.2 per cent. pure aconitine.

It has been averred by a recent investigator of aconitine that the benzoic acid obtained as a result of the saponification of the aconitine is derived from an intermediate product, benz aconine, between aconitine and aconine, and that the acetic acid is derived from the crystallized aconitine, thus making the determination of the acetic acid as a means of assaying the drug. Let me ask him—may not other alkaloids of aconite root besides either aconitine or benz-aconine be present that might yield acetic acid, and thus be counted as aconitine? At any rate, a standardized solution of alcoholic potash was freshly made and used for the saponification experiments, it being supposed that this would neutralize and hence determine both acids combined, and then by subtracting the weight of benzoic acid actually weighed, as given above, the amount of acetic acid would be determined. This is correct in theory, but does not work in practice, which may be due to certain additional alkaloids present as impurities or to a more deep seated change in the molecule due to the action of the potassium hydroxide. The results :

I. Aconitine taken 0.519 gm. ; added 15 cc. alcoholic potash (10 cc. of which represent 20.4 cc. decinormal sulphuric acid) ; diluted with alcohol. There were required 22.41 cc. decinormal sulphuric acid to neutralize the excess of alkali. These 22.41 cc. = 11.98 cc. potash solution. Hence 15—11.98=4.02 cc. potash solution were used to saponify the aconitine taken. These 4.02 cc. potash solutions represent 0.04796 gm. KOH. The benzoic acid formed during the saponification was filtered off and weighed and found to weigh 0.060 gm., and required for saponification 0.0273 gm. KOH. Hence for saponification of the acetic acid are required 0.04796—0.0273 gm.=0.02066 gm. KOH, equivalent to

$$\frac{645 \left\{\begin{matrix}\text{molecular}\\ \text{weight}\\ \text{aconitine}\end{matrix}\right\} \times 0.02066}{56} =$$

0.238 gm. pure aconitine ;
whence 0.519 gm. : 0.238 gm. = 100 : x and x = 40 3 per cent. pure aconitine.

II. Took 0.791 gm. aconitine, and by similar process to above found 76.3 per cent. pure aconitine.

III. Took 0.4365 gm. aconitine, and by similar process to above found 139.8 per cent. pure aconitine.

IV. Took 0.398 gm. aconitine, and by similar process to above found 41.3 per cent. pure aconitine.

V. Took 0.4135 gm. aconitine, and by similar process to above found 144.6 per cent. pure aconitine.

VI. Took 0.5680 gm. aconitine, and by similar process to above found 143.8 per cent. pure aconitine.

These results, deduced from the amount of acetic acid neutralized by the standardized alcoholic potash solution just given, show conclusively that this is not a reliable method of assay, for every sample examined was tested and found not to react acid to litmus, thus precluding the possibility of there being any free acid present to neutralize any of the potash and increase the percentage of acetic acid, *i. e.*, of aconitine present. The benzoic acid method also is unreliable, as it is not probable that sample IV., which melts at 83–97° C. (while pure aconitine crystals melt at 197–198° C) should contain as much as 77 per cent. of pure aconitine, and besides benzoic acid being volatile, some of it may escape by sublimation while being dried. From the results obtained the following conclusions may be drawn :

I. That none of the aconitines of the market examined are pure aconitine of melting point 197–198° C. (Freund.)

II. That no two of them are the same.

III. That no two can be regarded as sufficiently alike to enable a physician prescribing them to expect the same results from the same prescription compounded at different pharmacies, or at any rate of aconitines of different makes.

IV. That in no case can the physician expect to get the therapeutic effects of pure aconitine.

V. That sample I probably contains pseudaconitine principle ; that sample II probably contains apoaconitine principally ; that sample III probably contains apoaconitine and some aconitine ; that sample IV probably contains either a different substance from any above enumerated as existing in aconite root, or a decided mixture of substances that would much depress the melting point of any aconitine were it present ; that sample V probably contains fairly pure apoaconitine ; that sample VI is purer probably than the others, but is nevertheless impure to a slight degree, as it is cream-colored and should be white, and although it melts close to the melting point of pure aconitine, still yields the same results on titration as the others do.

VI. That until we know more about the remaining alkaloids and constituents of aconite root, no reliable method of assay of the root or the active principle aconitine can be devised, and that neither of the methods above tried is to be considered as reliable.

VII. That if aconitine is to be considered an official chemical by the U. S. P., some effort should be made to so establish its identity that a physician may get the effects of aconitine when he prescribes the same, and always get the same effects whenever he prescribes it.

Pimento.—Pimento, allspice, or Jamaica pepper is the dried berry of the pimento tree of Jamaica, which grows to the height of twenty or thirty feet, and the markets of the world are wholly supplied from this source. The tree will not grow on the coast lands, but flourishes best on the mountains of the interior island. The tree from the leaves of which the aromatic principle of bay rum is extracted, (Pimento acris) is also a native of Jamaica, but its cultivation has been neglected. The pimento tree is a plant of paradoxes. It is not friendly to cultivation, so that it has not been found possible to rear healthy plants from the seeds by artificial planting, and the stock cannot be successfully increased by slips. The seedlings thrive, however; when the seed has been digested by a bird, and this source of supply is largely relied upon. When it is desired to stock land with pimento, the trees growing upon it are cut down and their trunks are left lying where they fell. The bushes and the brush are burned, and the ground is planted with provision crops. after a lapse of some months, young pimento plants may be seen springing from the soil in various places. Care must be taken to keep cattle from them, for they are very fond of the spicy leaves and would destroy the young plants. After two or three seasons, cultivation is stopped and the grass is allowed to grow. Cattle are permitted to pasture on the land after the trees have grown out of their reach. The planter has now only to keep the land clear of brush and to gather his crops. The harvest begins in August, just before the berries turn black One of each party of pickers climb the trees, breaks off the berry-bearing branches, and throws them to his comrades, who strip off the berries. The tree is left in a ragged condition, and the process seems to be a barbarous one, but it is said to be best for the trees. If they are pruned, the branches cut die to the main stem; while if the limbs are broken off they shortly send forth new shoots; and it is claimed that the year's yield depends largely on the extent to which the limbs have been broken the previous season. The crop is next cured by drying, winnowed, and prepared for the market. Pimento holds the fifth place of importance in the exports from Jamaica, being exceeded in value only by sugar, rum, coffee, and fruit; but the demand for it is declining, and its importance is therefore growing less.—*The Popular Science Monthly.*

A New Oil.—Schimmels have obtained from the dry roots of Peucedanum officinale .2 per cent. of an oil of a golden yellow color, of very intense taste, somewhat resembling that of senega root. By cooling, there separates a solid body, which, when purified by recrystallization from alcohol, melts at 100°C. The oil contains free acids and esters, and requires 6.2 per cent. of KOH for neutralization and saponification. The specific gravity of the oil at 15° is .902.—*Seifen Zeitung.*

Solid Carbonic Acid.—Villard and Jarry have studied the temperatures produced by solid carbonic acid, and have recently published their results. Solid CO_2 melts at—56 7° C. under a pressure of 5.1 atmosphere. This result agrees closely with that of Faraday. The temperature when solid CO_2 evaporates under ordinary pressure is—79°. A mixture of ether with CO_2 produces no further reduction of temperature on evaporation—it is still—79°. A mixture of methyl chloride and CO_2, however, behaves differently. The latter dissolves in methyl chloride at—65° without evolving any gas. When saturated, the mixture falls to—85°, and if a stream of dry air be passed through the mixture the temperature falls to—90°. In vacuo (pressure=5 mm.) the temperature of solid CO_2 falls to—125°. It is inactive towards polarized light.—*Comptes-rendus.*

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ALERE FLAMMAM.

As the present number of THE ALUMNI JOURNAL goes to press, the new session of the College is about being inaugurated.

With an increased staff of Professors, an extended curriculum, and a building, which is unsurpassed by any in the land, it bids fair to mark an important year in the history of the College. That the aspirants for pharmaceutical honors are not slow to appreciate these benefits is shown by the largely increased number of junior students; larger than ever known since the College first opened its doors.

It must be very gratifying to the members of the Alumni to see the College thus growing—to see it enlarging its scope of teaching, and to feel that situated in the first city of the land, with the new advantages it now offers to the students of Pharmacy, it must soon fulfill its ultimate destiny, and hold not alone the position of first in the land, so far as instruction goes, which indeed it has always held, but also first in the size of its classes.

In order to introduce the new Professors to the readers of THE ALUMNI JOURNAL, we shall shortly publish the portraits of the faculty with short sketches of their careers.

THE first of the series of lectures before the Alumni Association will be delivered by the Hon. George F. Roesch, on the evening of October 9th. The subject, "Pharmaceutical Jurisprudence," is one that must interest the members of the Association, and its friends, and there should be a large attendance present.

LOUIS PASTEUR.

In the death of M. Louis Pasteur, which occurred at the age of seventy-two, at his residence at Garches, near St. Cloud, France, on September 28th, mankind has lost a true friend, and science a most worthy follower. The story of Pasteur's life is the story of modern medicine, of which he was the most earnest and enthusiastic disciple, and though as yet the hope held out to suffering humanity has been greater than the real good accomplished it has opened the field to a more thorough understanding of the causes of disease, and at the same time given us a rational method of treating them. Modern surgery owes much to his teachings, for the intelligent use of antiseptics, have rendered possible operations, which in former days were not thought of.

Louis Pasteur was born at Dole, December 22d, 1822 ; his father was a tanner who served as a soldier under Napoleon ; when Louis was two years old, the family removed to Arbois, where later Louis was sent to the local school ; then to Besancon College, preparatory to entering the Ecole Normale at Paris. Pasteur early developed a passionate love for the study of chemistry, becoming so absorbed in his work that all else was forgotten. It is related that on his wedding day he was so interested in his work, that he forgot the time of the ceremony and messengers had to be sent to remind him of the occasion.

We can but allude now to the more important discoveries of Pasteur, hoping at some future time to give a fuller account of his life work. Following in the footsteps of Jenner, Pasteur was a firm believer in vaccination as a preventive against disease; and as each particular disease was caused by its own special microbe, he believed we had but to cultivate this particular microbe, and by proper innoculation of the patient grant them immunity. Pasteur's scientific career is a long and honorable one, but for all his achievements, none have brought him such a wide-spread fame as the treatment of rabies. His experiments and successful work upon the diseases of the silkwork, upon Anthrax, and the Phylloxera have each been, patterns of careful experiment, and correct deduction, and been of lasting benefit to mankind.

"Such were some of the principal labors of the great savant who has just passed away. His life was a quiet one in the serene peace of laboratories and libaries: and the chief landmarks in it were soon told. He was successively assistant in physical science and preparator in chemistry at the Ecole Normale and doctor of sciences. A few years later, he became professor in Strasburg, then dean of the scientific faculty of Lillie. From this city he was, in 1857, recalled to Paris to become director of scientific studies at the Ecole Normale, then professor of geology, physics and chemistry at the Beaux Arts; finally, professor of chemistry at the Sorbonne. The Academy of Sciences, The Academy of Medicine, and finally, the French Academy, opened their doors to him.

"In 1874 he was voted a life annuity of 12,000 f., which the following year was increased by 6,000 f. He was made Grand Officer of the Legion of Honor in 1878. From the entire world he received the most flattering and enviable honors and distinctions. On December 27, 1892, on the motion of the medical and surgical section of the Academy of Sciences, the seventieth anniversary of his birth, was celebrated in the old Sorbonne. The President of the Republic, the Ministers, the members of Parliament, the diplomatic body, the scientific societies of France and delegates from the universities and colleges of the whole world came and presented to Pasteur the tribute of their enthusiastic admiration."

Tree Trunks as Filters.—A well known Austrian engineer, M. Pfister, has announced as having discovered a remarkable property of the trunks of trees, namely, that of retaining the salt of sea water that has filtered through the trunk in the direction of the fibers. He has consequently constructed an apparatus designing to utilize this property in obtaing potable water for the use of ships' crews. This apparatus consists of a pump which sucks up the sea water into a reservoir and then forces it into the filter formed by the tree trunk. As soon as the pressure reaches 1.5 to 2.5 atmospheres the water is seen—at the end of from one to three minutes, according to the kind of wood used—to make its exit from the other extremity of the trunk, at first in drops and then in fine streams; the water thus filtered being potable, freed, in fact, from every particle of the usual saline taste which is such a drawback to water obtained in the ordinary manner.—*The Pharmaceutical Era.*

THE MOST RECENT WORK.

New Test for Mercuric Chloride in Calomel.—To ascertain the presence of mercuric chloride in calomel, the following test has been recommended (*Pharm. Jour.*, LV. p. 75): The calomel (2 to 3 grains) is mixed with a drop of a 10 per cent. alcoholic soap solution and a drop of alcoholic solution of guaiacum resin freshly prepared, and the mixture well stirred with 2 c.c. of ether. If mercuric chloride is present, it will be indicated by an intense green coloration being produced on evaporating the ethereal solution.—*Merck's Report.*

Absorbent Blocks for Drying Precipitates.—Moist precipitates are found by Austen and Broadhurst (*Pharm. Jour.*) to dry readily on absorbent blocks made by thoroughly mixing equal parts of plaster of Paris and infusorial earth, moistening with water sufficiently to work easily and placing in molds made of glass, slightly greased to prevent sticking. When set, the blocks are removed and heated for a day or two in an air chamber at 100° to 120°C. to free them from hygroscopic moisture. In use, the filtering paper containing the moist precipitate is placed on the smooth side of the block.

A New Test for Curcuma.—In powdered drugs such as rhubarb and mustard, is given (*Pharm. Centralh.*, XXXVI, p. 407), as follows: A small quantity of the powdered drug is mixed with a few drops of either anise or fennel oil, and the mixture examined by means of a microscope. A yellow coloration of the oil indicates the presence of curcuma.—*Merck's Report*

Detection of Ergot in Bran.—The method of E. Hofmann, according to Ulbricht, is useless if bran contains the seeds of Polygonum convolvulus. The author finds that 0.2 per cent. of ergot, and even smaller quantities, can be detected microscopically if the bran is previously digested for two hours on the water bath with sulphuric acid at 1.25 per cent., then with soda-lye of the same strength, and, lastly, treated in the cold with absolute alcohol and ether.—*Zeit. Anal. Chem.—Br. and Col. Dr.*

Assay of Ergot.—A. R. L. Dohme has made a study of Ergot in reply to a query of the A. Ph. A. The method of analysis was based on Keller's Assay process.

Keller has isolated a body which he calls Cornutine, which he claims is an alkaloid and the active principle of Ergot. He has prepared salts of it, but not in sufficient quantities to warrant chemical examination and analysis.

For the present, all that can be published are the assays of the various kinds of Ergot obtainable in this market by this market by the method of Keller; assuming that the semi-crystalline residue which is thus obtained, and which dissolves in acids, is a homogeneous substance. Keller's method of assay is given below. Ergot in powder, 25 grams. Percolate with petroleum ether until a drop no longer leaves a residue on evaporation. Dry and put into a flask, and add 100 grams ether. Then add milk of magnesia (1.0 grams MgO to 20 cc. H_2O). Shake well, when the Ergot balls together, and continue shaking for half an hour. Pour off 80 grams ethereal solution, or an aliquot part (4 grams representing 1 gram Ergot). If not clear, let stand several hours and filter. Shake out with 0 5 per cent. hydrochloric acid solution in three portions of 25, 15 and 10 cc. respectively until Mayer's solution no longer gives a precipitate. If the acid solution is flocculent, filter after adding some powdered talcum. Shake out acid solutions with an equal amount of ether after adding ammonia in excess. Repeat three times and distill ether from tarred flask.*

By applying this method of assay to samples of Spanish, German and Russian Ergot obtained in New York, the following results were obtained:

German Ergot, (a) 01.15 per cent. cornutine of Keller, (b) 0.14 per cent. cornutine of Keller, (c) 0.15 per cent. cornutine of Keller, mean 0.15 per cent.

Spanish Ergot (a) 0.29 per cent. cornutine of Keller, (b) 0.28 per cent. cornutine of Keller, (c) 0 29 per cent. cornutine of Keller, mean 0.29 per cent.

Russian Ergot (a) 0.18 per cent. cornutine of Keller, (b) 0.19 per cent. cornutine of Keller, (c) 0.17 per cent cornutine of Keller, mean 0.18 per cent.

Until we know more of this cornutine of Keller, the best we can say is that Spanish Ergot is more valuable than Russian Ergot and this more valuable than German Ergot. Keller has made the interesting observation that Ergot by aging becomes weaker in cornutine, or; in other words, loses its strength; for a sample of German Ergot which he assayed and which he knew to be several years old, he found to contain considerably less cornutine than fresher Ergot which he assayed. Should subsequent work show that Keller's cornutine is the active

*The Cornutine can be obtained in crystals if the ethereal solution is allowed to evaporate spontaneously and slowly.

principle of Ergot, and that his method extracts all of this substance from the drug, then the above results may become of value ; as it is, they can merely be regarded as indications and possess interest rather than value.

Synthetic Indigo—It is claimed that the Actien-Gesellschaft für Anilin-Fabrication zu Berlin (*Zeit. All. Oest. Apoth.*) has solved the problem of producing indigo synthetically, which, if true, would disastrously affect the English indigo trade, and revolutionize this branch of the dyer's industry, much as madder was displaced not long ago by alizarin. The patent specifies that methylated anthranilic acid (a product of coal-tar distillation) is fused together, under exclusion of air, with caustic alkali, the resultant compound is dissolved in water and the solution exposed to the air, when the blue dye, identical chemically and physically with natural indigo is produced.

Copper Tannate Against Mildew in Plants.—Jone and Crouzel recommend (*Pharm. Centralh.*, XXXVI, p. 407), copper tannate against mildew in plants. It may be prepared as follows: 20 kilos (44 lbs.) of oak or pine bark, or, still better, 10 kilos (22 lbs.) of fir bark, are coarsely comminuted and boiled for an hour in 50 liters (13 gals.) of water, additional water being added from time to time to make up the loss by evaporation. The liquid is decanted, and 1 kilo (2½ lbs.) of copper sulphate, previously dissolved in 2 or 3 liters (say, 3 quarts) of water, is added, and finally enough water to make the whole measure 100 liters (25½ gals.) Copper tannate does not attack the implements, nor does it harm the parenchyma of young or tender leaves, it is reported, and may therefore be used to advantage on tomato, potato, and grape vines.—*Merck's Report.*

The morphological place of moulds and yeasts, respectively, has long been the subject of speculation and research, some authorities regarding yeasts as having an independent existence, others considering them as only transitory forms in the life-history of moulds. Most important and interesting contributions to this subject have recently been furnished by the experiments carried on in Dr. Jörgensen's laboratory in Copenhagen. In the course of some researches on the diastatic power of the well-known Japanese mould Aspergillus oryzæ, Juhler found that in the flasks in which this mycelium had converted rice-starch into sugar, it had produced a growth of typical alcohol producing saccharomyces cells. This most interesting observation was subsequently confirmed by Jörgensen, who has since endeavored to ascertain if the various types of alcohol producing yeasts can be traced to particular moulds, and already he has succeeded in demonstrating the evolution of wine yeast cells from a particular mould extensively present on grapes. Dr. Jörgensen intends to continue these most suggestive investigations, and publish his results from time to time in the form of a separate Berichte exclusively devoted to the work carried out in his laboratory. In pursuing these researches, Dr. Jörgensen will not only render great practical service to the science of fermentation, but he will also lay botanists under deep obligation to him for having rendered possible a more extended and accurate insight into the life-history of moulds.—*Nature.*

Borated Carmine as a Stain for Cellulose.—The aqueous solution of borated carmine is much used as a stain for cellulose ; but, before it can be applied, it is usually necessary to first destroy the contents of the cell thus revealing but the skeleton of the latter when examined under the microscope. Without this precaution, the alcohol used for fixing the carmine would cause a dense precipitate of the latter to form in the interior of the cell, thus considerably hindering certain researches in histology. M. M. Radais (*Jour. de Pharm. et de Chim.*, xv, p. 149) has succeeded in producing a borated carmine solution which, it is claimed, does not possess the above disadvantages. It is made as follows :

Powdered Carmine........	2 gm.
Sodium Borate............	8 gm.
Alcohol, sp. gr. 0.89.......	200 gm.

This mixture is introduced into a retort provided with an inverted condenser. The retort is then heated on a water-bath, and kept at the boiling point for twenty minutes ; the mixture is allowed to cool, and, finally, it is filtered. The finished product should have a specific gravity of 0.89. It is well, in order to allow for any loss of alcohol by imperfect condensation, to employ slightly stronger alcohol than that indicated above—one of about 0.885 specific gravity. This carmine solution is said to keep well in securely stoppered bottles. The sections to be stained should first be soaked, for a few minutes, in alcohol of 0.89 specific gravity, and then immersed in the carmine solution for ten minutes or longer ; the immersion may be made prolonged without danger of over-staining the specimen. The nuclei, and especially the cellular membranes, are thereby strongly colored; the membranes are the more quickly stained the more pectin they contain; lignified and suberific tissues are not stained. After being thus stained, the sections are washed in alcohol of 0.89 specific gravity, whereupon they are dehydrated by being immersed successively in diluted alcohol made a little stronger in each successive step. They are then mounted in an anhydrous medium. This borated-carmine solution is said to be also well adapted for double staining—as with iodine green or with methylene blue. For instance, the sections first stained with the iodine green are deprived of their surplus of coloring matter by being washed in alcohol (0.89 sp. gr.); then they are immersed in the carmine solution, which supplants the iodine green stains in all tissues, excepting those which have become lignified; the latter retain the first stain. In such double staining processes, it is a difficult matter to fix the length of time necessary for each immersion. It is necessary to closely watch the action of the different fluids upon the material to be stained.—*Merck's Report.*

The Atomic Weights of Nickel and Cobalt—Clemens Winkler finds the atomic weight of nickel, as calculated from the mean result of his experiments, 58.7433, and that of cobalt, 59.3507. These atomic weights are referred to H = 1 and I = 126.53.—*Zeit. Anal. Chemie.*

The Estimation of Hydrastine.—Linde has published the following method for the estimation of hydrastine in the fluid extract of Hydrastis. 10 grammes are evaporated in a porcelain dish on the water bath to 5 cc., and transferred into a separator with the aid of a little water and brought up to 10 cc. To this are added 10 cc. of petroleum ether, 50 cc. of ether, and 5 cc. of 10 per cent. ammonia. The mixture is well shaken for a few minutes and allowed to separate; 50 cc. of the ethereal layer are transferred to another cylinder and shaken with 10 cc. of 5 per cent. hydrochloric acid. The ether is removed on separation, and the acid solution is washed with ether to remove traces of fat. When this is done 5 cc. of ammonia is again added, and the liberated alkaloid extracted with 50 cc. of ether; 40 cc. are separated and the ether evaporated, and the base is weighed. The amount multiplied by 1.5 is the quantity in 10 grammes of the extract. The author also proposes a method for the estimation of the berberine.—*Apothker Zeitung.*

Snake-Bite Antitoxine.—At a recent meeting of the Royal Society of Edinburg, Prof. Fraser delivered a lecture embodying some extremely valuable and interesting data obtained by him during several years of experimental work on an antidote for snake poisons. The principles utilized by him are similar to those employed in the anti-toxine treatment of diphtheria and in vaccination for small pox. He first immunized an animal by repeated small doses of the snake poison, slowly increasing in quantity, until the animal was taken at a single dose many times the minimum lethal amount for a non-immunized individual. He then injected into another animal some of the blood serum from the immunized case, and found that this prevented many ill effects from a subsequent injection of venom. Still a third animal was given an injection of pure venom, and, when distinct symptoms of poisoning appeared, was treated with the immunizing serum, with the result that the symptoms of poisoning disappeared and no ill effects followed. When it is remembered that in British India alone there are each year from eighteen to twenty thousand deaths caused by snake bite, the great beneficence of this discovery is apparent. Prof. Fraser is at present immunizing a horse, but is having some trouble, owing to the difficulty of procuring the snake-poison in sufficient quantity.—*The Popular Science Monthly.*

Tests for Rhubarb in the Urine.—Urine, voided after the use of rhubarb, as is well known, possesses the property of reducing copper tartrate and bismuth tartrate in alkaline solutions. It is, therefore, of importance to know, when testing for sugar in the urine, that no rhubarb is present therein. E. Proksch (*Pharm. Centrath.*, xxxvi, p. 341) gives the following tests for rhubarb: (1) To the urine add hydrochloric acid, then xylol, and shake. Then pour the xylol layer upon potassa solution. If rhubarb is present, a pink color manifests itself in from 5 to 10 minutes, at the point of contact of the two solutions; (2) the same test conducted with chloroform, instead of xylol, shows a violet coloration at the point of contact of the two liquids; (3) if sulphurous acid be added to the urine, the mixture shaken with chloroform, and the chloroformic layer then treated with potassa solution, a pink color will be developed in case rhubarb be present; (4) if the urine be treated with sulphanillic acid, and shaken with xylol, the lower, aqueous layer will be colored a wine-red color, while the xylol solution will have acquired a faint pink coloration, if rhubarb be present. It is said that, as this test depends upon the presence of chrysophanic acid, senna leaves might also produce the reaction, though in a less degree.—*Merck's Report.*

An examination of the gases liberated from certain of the sulphurous waters of the Pyrenees reveals, in the hands of M. C. H. Bouchard, the interesting fact that the formerly assumed nitrogen (from which the Spanish physicians have named these waters azoades) consists in part of free argon and helium. The collected gas was in each case, after treatment with potash and phosphoric anhydride, introduced into a Plücker tube containing magnesium wire. Under the action of the silent discharge the nitrogen rapidly disappeared by combination with magnesium, leaving a residue exhibiting the characteristic rays of both argon and helium for the gas derived from the waters of La Raillère, helium from the springs of Bois, and helium together with probably an unknown gas from the waters of lowest temperature at Bois. —*Nature.*

Crystallized Carbon Dioxide.—According to Prof. Liverside (*Chem. News*), when solid carbon dioxide is examined under the microscope, its presents along its edges projecting wire-like crystals, which have branching filaments, issuing from them apparently at right angles, resembling somewhat the groups of minute crystals seen in crystallized iron, gold and ammonium chloride. The rapidity with which the carbon dioxide evaporates makes it difficult to catch the form of the crystals, either by photography or other means. — *The Western Druggist.*

Pictet's Gas.—M. Pictet having observed that an addition of carbonic acid to sulphurous acid seemed to materially increse its powers of desinfection, requested Professor d'Arsonval to investigate the value of this admixture and report thereon. (*Ph. Jr.*) M. d'Arsonval has communicated to the Société de Biologie the results of his experiments. He finds that CO_2 and SO_2 in the proportion of four of the former to six of the latter combine chemically to form a gas (which he calls Pictet's gas) possessing marked antiseptic properties and extraordinary powers of diffusion. Thus, cultures of typhoid and cholera were placed on rags between the leaves of a book which was enveloped in cloth and exposed to the influence of the gas. In the space of an hour the germs were found to be entirely destroyed. Pictet's gas has also been fatal to microbes, which were still living after their treatment with sulphurous acid.

Narceine.—Another useful addition to alkaloidal chemistry has just been published by Freund. He has prepared narceine amide by treating narcotin-methyl-iodide in watery solution with excess of alcoholic ammonia, and allowing the mixture to stand for several days. By suspending the crystals in solution of ammonium chloride, the hydrochlorate was obtained, $C_{23}H_{28}N_2O_7HCl$. Free mineral acids convert the amide into narceine imide, $C_{23}H_{26}N_2O_6$. When an alcoholic solution of the amide base is heated with methyl iodide, the imide base results, which then combines with methyl iodide to form an iodo-methylate. By heating this with strong alkalies, trimethylamine is evolved and narceonic acid imide $C_{21}H_{19}NO_6$, is formed. — *Liebig's Annalen.*

Helenin.—Bredt and Posth have again investigated the bitter principle of Inula helenium; which they term helenin. They state that the body possesses the constitution of alantolactone. This has the composition $C_{15}H_{20}O_2$, and is a neutral body dissolving in alkaline solutions with the formation of salts of the corresponding oxyacid. The latter body passes into the lactone on heating to the melting point. The free oxyacid, alantolic acid, is $C_{14}H_{20}(OH)(COOH)$, and is obtained by decomposing its salts with dilute sulphuric acid in the cold. It melts at 94°. By decomposing its silver salt with methyl iodide the methyl ester is obtained, which, by heating, gives off methyl alcohol with the formation of the lactone. By the action of alcoholic ammonia, the amide of the oxyacid is obtained.—*Apotheker-Zeitung.*

The Condensation Products of Isovaleric Aldehyd.—L. Kohn has obtained two products; the one boiling at 82° under a pressure of 15 m. m., seems identical with that studied by Kekulè, Fittig, Beilstein, and others, and probably with the product obtained by Barbier and Bouveault. The second product is an oil of feeble odor, colorless, boiling at 140° under a pressure of 18 m. m. It seems to be a polymer of valerol. — *Chem. News.*

Manganese Deposit.—A deposit of manganese ore 6 ft. thick has recently been struck near Parkenstein, Bavaria, at a depth of about 120 ft. An analysis which has been made of the ore shows it to contain 44 per cent. of metallic manganese. — *The British and Colonial Druggist.*

PLANT CONSTITUENTS.

BY HENRY KRÆMER, Ph. G.

(*Continued from September issue.*)

XV. *Ferments* are of two kinds: (1) *Organized*, as bacteria and yeast; (2) *Unorganized* ferments which may be divided into (a) *Starch* or *Disastatic Ferments*, as diastase; (b) *Glycoside Ferments*, as emulsin and myrosin; (c) *Cane Sugar Ferments*, as invertin; (d) *Propteid* or *Peptic Ferments*, as in Carica papaya. XVI. *Alcohols* are of two kinds: (1) *Fatty*, as mannite ($C_6H_{14}O_6$) and (2) *Aromatic*, as saligenin ($C_7H_8O_2$). XVII. *Acids* may likewise be considered as of two kinds: (1) *Fatty*, as valerianic acid ($C_5H_{10}O_2$); caprylic acid ($C_{10}H_{20}O_2$); (2) *Aromatic*, as benzoic (C_6H_5COOH), citric [$C_3H_4(OH)COOH$], malic [$C_2H_3(OH)(COOH)_2$] and aconitic [$C_3H_3(COOH)_3$] acids. XVIII *Aldehydes*, as cinnamic aldehyde (C_9H_8O). XIX. *Esters*, as cinnamein or benzylic cinnamate [$C_9H_7(C_7H_7)O_2$], styracin or cinnamyl cinnamate [$C_9H_7(C_9H_9)O_2$]. XX. *Resins* may be divided into (1) *Oleoresins*, as copaiba and gurjun; (2) *Balsams*, as balsam of Peru, balsam of Tolu; (3) *Gumresins* like asafœtida and myrrh; (4) *True Resins*, as benzoin, colophony and guaiac. XXI Other plant constituents, as cutin, suberin, lignin, bast, etc., which consist of C, H and O.

Before we can study these constituents or groups of principles it will be necessary to consider briefly the environment of the plant and its food. The vegetable kingdom is divided into two great classes of plants, viz.: those possessing chlorophyll, and those without chlorophyll. The higher plants are distinguished from the lower in possessing a greater differentiation and in being fixed to one place in the soil. These higher plants may flourish in dry soil or may live in the water (aquatics). If any of these higher plants are examined, they will be found to possess numerous openings (stomata in leaves and lenticels in the bark) for obtaining air. This air may be used as food by the plant, or for breathing, and in the case of marsh plants which are provided with very large intercellular spaces it is probably also used to prevent the total submergence of the plants. The air is a requisite to the plant life. It is further observed that if a plant is deprived of water too long it ceases to grow and finally wilts. Growing parts of plants contain from 60 to 90 per cent. of water, and some fungi contain as high as 92 to 98 per cent. Finally it is observed that if a phytomer is cut from a hardy perennial and placed in soil under the proper conditions it will grow and produce a new plant. But if a similar phytomer is placed in the air, or in water and air without any soil, it will die. Hence the question arises, what is there in the soil required by the plant?

Soil is formed by the alteration of igneous rocks, and in them we find the sources of the minerals that enter into soils. These minerals are principally quartz, the felspars, the micas, the amphiboles, the pyroxenes, olivene, leucite, nepheline, magnetite. These decay (with the exception of quartz) under the influence of the atmosphere and water and become hydrated silicates, carbonates and hydrous oxides. If to these are added limestones and dolomites we have the principal rock soils. According to the varying nature of the rocks so are the soils different. There are sandy soils (from sandstones), calcareous soils (from limestones), aluminous soils (from schistose rocks), and also gravels, marls and peaty soils. The physical properties of a soil according as it is impervious, stiff and heavy, or porous, pliable and light, are of considerable importance, as they indicate whether it is a retainer of moisture or a quick drainer. Rocks that are complex, form on decay, a mixture of the different kinds of soil. But when they are not complex the soil sometimes requires the addition of the materials in which it is wanting. A quartz soil requires the addition of limestone and felspars in order to make it fertile. Clays require the addition of lime. Shales and sandstones require lime or gypsum.

We also hear much of the "virgin soil" of the West and the "spent soil" of New England and "old fields" of Virginia. The latter is spent and old because the constituents (principally the compounds of nitrogen, potassium and phosphorus) that have been removed from the soil in the process of agriculture, have never been replaced. This condition is met to-day by inducing a proper rotation of crops and by the addition of fertilizers, manures, bones, guano, commercial phosphates, gypsum, cretaceous greensands and marls.

Soils are produced not only by the disintegration of rocks, but also by the decay of animal and vegetable matter which latter forms "humus" and mixes with the minerals from the rocks. The disintegration of rocks is produced by the action of the atmosphere and in climates exposed to varying amounts of humidity and sudden changes of heat and cold, there results an unequal cohesion and breaking up of the rocks. This influence is noticeably present in the splintering and peeling off of pieces of the Obelisk in Central Park in New York City. This disintegration of the rocks is further influenced by the plants themselves, as may be seen in our mountains at all times. The roots of plants secrete from their hairs an acid which corrodes the mineral. In this manner is produced a soil consisting of a fine scaffolding of stone particles between which the humus is scattered. It is the humus that assists the soil in absorbing liquids and gases, and in examination of humus will reveal on the surface a film of water, called by Sachs "hygroscopic water."

The character of food required by the plant has been ascertained by synthetic experiments. Water cultures have shown that a mixture of salts, amounting to 0.17 per cent. of the water is sufficient for the plant. The plant derives its food from the air or the soil, or both (sometimes from water). It was formerly supposed that all of the carbon used by plants containing chlorophyll comes from the atmospheres as CO_2 (that of fungi comes from organic matter), notwithstanding that the humus contains 300 times as much as is found in the air. The question of the source of the nitrogen taken up by the plant, is still unsettled. In cereals there is a direct ratio between the soil and the nitrogen they contain; hence it is supposed that they derive their nitrogen from the soil. In the Leguminosæ there is a marked difference observed between the nitrogen in the soil and that which they contain, there being an excess of nitrogen in the plants over that in the soil. Recent investigations have shown that they are collectors of nitrogen from the air. Their roots are found to contain tubercles which have been variously pronounced as excresceces and organs of the plant. Frank found, in these tubercles, bacteria which have been since studied and are known as nitrogen bacteria, and possess the ability to change N and NH_3 into nitrites and nitrates.

I. *Carbon* represents about 50 per cent. of the weight of the dried plant; in plant constituents it varies from 26 66 per cent. in oxalic acid, to 51 47 per cent. in legumin and is as high as 92.31 per cent. in styrol. The form in which it is absorbed depends upon the plant. (1) Plants that possess chlorophyll use the CO_2 of the atmosphere when the sun shines. (2)

Plants without chlorophyll — and this comprises parasites (living on other plants) and saprophytes (living on decaying matters)—have the property of assimilating such carbon compounds (see under nitrogen) as cannot be assimilated by green plants (Naegeli). Yeasts, bacteria and moulds will absorb sugar, mannite, the carbon group in leucin, ammonium tartrate, and succinate, the carbon group in asparagin, ammonium acetate, ethyl alcohol, ammonium quinate, benzoate and salicylate, the carbon groups in propylamine and methylamine and phenol; they cannot assimilate carbon in the form of cyanogen compounds, urea, ammonium formate and oxalate (Nageli). (3) Insectivorous plants assimilate carbon compounds (Darwin).

II. *Oxygen* is taken up by the plant from the air for purposes of respiration and also combined with CO_2, H_2O and organic compounds for purposes of assimilation. All growth in fact is accompanied by oxidation of the assimilated material (food). Germinating seeds have been found to take up oxygen and give off CO_2. Experiments have shown that all plants (when growing in a closed space) have the power of absorbing all of the oxygen present. The less chlorophyll a plant contains the greater seems to be its avidity for oxygen; but this same plant exposed to intense light, exhales more oxygen. De Saussure found that the essential organs of the flower are those which absorb the largest proportion of oxygen and that the andrœcium does so more actively than the gynæcium (Vines). It appears that the absorption of oxygen is most active when the flower is fully open.

III. *Hydrogen* occurs in much smaller amounts than either carbon or oxygen and varies from 1.99 per cent. in ellagic acid to 12.82 per cent. in menthol. It enters with carbon into the formation of all the tissues and food of the plant. It is absorbed by all plants in the form of water and is also absorbed in the form of ammonia, ammonium salts and also in complex carbon compounds. Under certain conditions, as when seeds are germinated in a sealed tube, hydrogen is evolved. This gas has also been evolved when some parts of the olive, and indeed when any part of a living plant, is insufficiently supplied with oxygen. Aquatic plants under similar conditions give off methane (CH_4).

IV. *Nitrogen* enters into the composition of the proteids, the alkaloids, some of the glucosides (cathartic acid) and some of the neutral principles (aloin). It varies from 1.17 per cent. in glycyrrhizin to 15.65 per cent. in albumin and reaches 31.11 per cent. in theobromine. Nitrogen is absorbed by the plant in the form of ammonia and its salts, and as nitrates, and plants containing chlorophyll may take up such nitrogen-bearing compounds as urea [$CO(NH_2)_2$], glycycoll or amido-acetic acid ($C_2H_5NO_2$), asparagin or amido-succinamide ($C_4H_8N_2O_3$), leucin or amido-caproic acid ($C_6H_{13}NO_2$) and tyrosin or amido-hydrocumaric acid ($C_9H_{11}NO_3$). Some of these are decomposition product of proteids while others are from the urine of animals. Fungi are capable of assimilating nitrogen in the form of proteids, methyl-amine and other amines. Naegeli concludes that they assimilate nitrogen most readily when it is supplied to them in the form of NH_2. Chlorophyll-producing plants require ammonium salts for their best development. Nitrates may be utilized by all except the lower plants. The yeast, for instance, cannot utilize nitrates (Pasteur). The following salts of ammonium may be absorbed by the plant:

NH_4Cl, NH_4NO_3, $(NH_4)_2SO_4$, $(NH_4)_3PO_4$; the nitrates of Na, K, NH_4, Ca and Mg are readily absorbed by the plant.

V. *Potassium* is required by the plant in the formation of organic materials. If a plant is deprived of some salt of potassium it is found to be unable to manufacture starch. It is most abundant in seeds, rhizomes and leaves, and it is supposed to play a very important rôle in the formation of carbohydrates and in the storing of the same. Liebig expressed the view that it was due to potassium salts that the carbohydrates are distributed in the plant. This has not been confirmed and on the other hand the experiments of Nobbe indicate that while the production of starch in the leaves is dependent upon potassium, a particular salt (KCl) is required for the transportation of starch.

VI. *Calcium* is especially abundant in the leaves of green plants. It is found, chiefly, in the cell-walls as CaC_2O_4 and $CaCO_3$. It is also found as crystals in cells and as a crust upon the surface of some plants. Sachs suggests that it enters into combination with cellulose. It forms well known compounds with the proteids. Calcium is absorbed by the plant as nitrate, phosphate, sulphate and carbonate (the last decomposes during the process). The function of calcium is not clear, but it is supposed to be connected with the growth of tissues above ground (as stem and leaves). It is also supposed that it combines with such organic acids, as are not required by the plant or may be even injurious to it, forming insoluble harmless and waste material. It is possible also that in the form of crystals in conjunction with bast fibres (quercus alba) it may have a strengthening effect.

VII. *Magnesium* occurs in aleurone grains as a double phosphate of Ca and Mg termed "globoid." The function of magnesium, like that of calcium, is not understood, although it is supposed to assist in the development and transportation of proteids. It is used in the form of salts similar to those of calcium and it may replace calcium in the food of moulds.

VIII. *Sulphur* is used by the plant in the form of sulphates of NH_4, K, Mg and Ca. It occurs in plants as: (a) sulphates in the cell-sap; (b) in some glucosides, as, for instance, in myronic acid ($C_{10}H_9O_{10}NS_2$); (c) in proteids, which contain 0.4 to 0.8 per cent. of sulphur; (d) some volatile oils, as that of mustard (C_3H_5CNS); (e) in some gum resins, as in asafœtida; (f) and in other substances as scleromucin containing 26.8 per cent. sulphur. In its function it is supposed that the $CaSO_4$ as absorbed by the plant is decomposed by $H_2C_2O_4$, forming CaC_2O_4, and the S is set free by a process of reduction and combines with the varions carbohydrates forming proteids, etc. Sulphur is supposed to be a necessary part of the protoplasm.

IX. *Phosphorus* in the form of phosphates exercises an important and beneficial influence upon the assimilation of nitrogen. It enters into the composition of the organized parts of the plant in nuclein and plastin (vines). Schumacher holds that the alkaline phosphates accelerate the diffusion of the difficultly diffusible substances (albuminoids). Combined in lecithin ($C_{44}H_{90}NPO_9$) it is said to be contained in the actively growing cells of most plants. Hoppe-Seyler and Arm. Gautier, have found phosphorus in the molecule of chlorophyllan (the crystalline product of chlorophyll).

X. *Iron* is a constituent that must be present in the development of green plants. It may be absorbed by the plant in different forms. It is not clear that it enters into the composition of the chloroplastid, but it is highly probable that it exists in the form of an organic compound in the plant. A plant that loses its green color through lack of iron is said to be chlorotic. This condition is sometimes confounded with etiolation, which means lack of green color through deprivation of light.

XI. There are some elements that would seem not to be essential to plant economy ; yet it is well known that they are absorbed und utilized by some plants. Among this class may be mentioned Si, Na and Cl.

(1) *Silicium* enters the plant in the form of soluble silicates and possibly as silicic acid. It occurs principally in the cell-wall. There are few plants (if any) that will not show the presence of Si in their ash. It was formerly thought that Si was necessary, especially to cereals. Sachs, however, showed that the amount of SiO_2 could be reduced from 1.8 per cent. to 0.7 per cent without injuring the plant. The breaking down of SiO_2 was supposed to be due to lack of SiO_2 in the soil (Davy), but it is now known to be due to etiolation. The leaves of cereals contain more SiO_2 than the stems. It is supposed that SiO_2 is useful to many lower forms of plant life (diatoms) in preventing the entrance of the germinating tubes of fungus spores.

(2) *Sodium* is always present, even though in but minute quantities, in the ashes of plants. It is present in marine plants in considerable quantity at times —perhaps from adhering salts. A very small quantity is absorbed by the plant and its usefulness is questioned.

(3) *Chlorine* is supposed to be required by some plants in the transportation of the carbohydrates. In some experiments made upon buckwheat plants that were raised in a solution without chlorides, the chlorophyll corpuscles became overcharged with starch grains, owing to the fact that the starch was not carried out rapidly enough. This condition was remedied by the addition of KCl. It is, however, observed, that maize plants will grow well in solutions without chlorides and that the accumulation of starch in the chlorophyll-corpuscles may be induced by various abnormal external conditions.

(4) A few other constituents are found in some other plants in noticeable quantities as, (a) Iodine and bromine in marine plants. (b) Aluminum in the spores of Lycopodium. (c) Manganese in some *Cupuliferæ.* (d) Rubidium in the beet-root. (e) Fluorine in *Lycopodium clavatum.* (f) Zinc in some species of *Viola* and *Silene* growing on zinc soil.

In subsequent papers the localization and chemistry of the various constituents will be considered, with tests for these principles, and their service in the plant economy where it may be possible to indicate it.

The yellow coloration of milk on exposure to heat is due, according to M. Cazeneuve and M. Haddon, to the oxidation of the lactose in presence of the alkaline salts of the milk. Lactose during this oxidation yields acids, especially formic acid, easily detected, the presence of which suffices to explain the coagulation of the milk as it ensues with any acid.—*The Popular Science Monthly.*

Saccharin as an Antiseptic.—Burkart and Seifert have undertaken a series of experiments on the relative antiseptic value of pure saccharine. They find that it has only one-fifth of the antiseptic value of salicylic acid, if pure saccharin be used. Ordinary saccharine, containing 60 per cent. of pure benzoyl-sulphonic imide and 40 per cent. of para sulphamido-benzoic acid, is only one-eighth as powerful as salicylic acid, which fact points to the para acid being without any antiseptic value at all. The preservative action of saccharine depends, further, on the fact that it replaces, in the product in which it is used, substances of a highly fermentable nature.—*Annales de Pharmacie.*

NOTES HERE AND THERE.

Unsanitary Filters.—For many years before any positive connection was established between typhoid fever and a specific micro-organism, it was known that this and other diseases were in some way connected with the composition of the drinking water previously consumed by the patient. By chemical analysis it was found that in almost all such cases the water contained an excess of organic matter; it was accordingly inferred that removing the organic matter would correct the trouble and obviate any further danger; and filters were made with this end in view. It is now known, however, that the danger from waters containing much organic matter lies not in the organic matter per se, but arises from the fact that a large amount of organic matter attracts and feeds a proportionately large number of bacteria. It has been proved experimently that after a filter of this class has been in use for some time, water, in passing through it, becomes much richer in bacteria, and even that sterilized water passed through it is found swarming with micro-organisms. The filter collects the organic matter from the water and with it some of the bacteria. This mass of organic matter serves as an admirable culture medium; as the bacteria multiply, they are taken up by the water as it passed through the filter, so that, instead of serving as a safeguard against disease, such filters are really disease breeders. In order to be effective, a filtering apparatus must either remove or destroy any micro-organisms contained in the water.—*The Popular Science Monthly.*

Formation of Stalactites.—Describing the deposition of carbonate of lime in stalactities and stalagmities, Mr. George P. Merrill, of the United States National Museum, says that water filtering through a rock roof by virtue of the carbonic acid it contains, is enabled to dissolve a small amount of the lime carbonate, which is again deposited when the excess of carbonic acid escapes either through relief from pressure or through the evaporation of water. Conditions favorable to either process are furnished by the water filtering through the roof of a cave and dripping slowly to the floor beneath. In cases where the water filters sufficiently slowly or evaporation is correspondingly rapid, the deposit of lime carbonate from the roof takes at first the form of a ring around the outer portion of the drop, a natural consequence of the evaporation of a suspended drop of liquid. This process may go on until the ring becomes prolonged into an elongated cylinder or tube, the diameter of which may not exceed five millimetres, though usually ranging from five to ten, and of all lengths up to fifty centrimetres. In exceptional cases, this length may be exceeded, but owing to the delicacy of the material, the stalactite usually breaks from its own weight and falls to the floor before the length of even ten or fifteen centrimetres is reached, to become imbedded in the stalagmitic material there forming. Lengths of even these dimensions are comparatively rare, for the reason that the tube becomes shortly closed, either at its upper or lower end, usually the upper, and all growth from the extremity alone ceases, subsequent depositions being wholly exterior, and taking place in the form of concentric coatings of the carbonate on the outer surface and at the same time from the top. There is thus formed around the original tube a compact cylindrical mass, in its typical form, constricted at the point of attachment, but thickening rapidly and then tapering gradually into an elongated cone. The material of the stalactites is not always wholly carbonate of lime, but in some cases thin intervening coats of iron disulphide are met with. Through a kind of crystallization, the material sometimes undergoes a distinctly fibrous arrangement, but oftentimes the structure is granular throughout.—*Ibid.*

Cinchona Speculation.—A short time ago it was announced that it was proposed to erect a quinine factory upon the Island of Java. Whilst this has not as yet been accomplished, it appears that negotiations are on foot with the planters, which will, if consummated, have a marked effect on the quinine market. Dr. Buchler has gone out as a delegate from the German manufacturers, and one English manufacturer, and has been at Solkaboemi, for some short time. The purpose of his visit is to make a contract for five years with every cinchona planter on the island without exception. The terms proposed by Dr. Buchler, on behalf of the manufacturers are as follows: 1. They shall pay per half kilo of bark at the rate of 6 centens (50 centens are almost equivalent to one shilling) per unit. By a unit is meant each one per cent. of quinine sulphate from the bark: Thus, a bark yield 5 per cent. would cost 60 centens per kilo. 2. To allow the planters half the profits that the manufacturers make after the quinine sulphate has fetched 24 florins per kilo. This price is considerably higher than that holding on the markets. In return, the Java planters must unanimously agree not to supply more than half the bark required for the world's consumption. This is estimated at 235,000 kilos of quinine sulphate, so that Java shall only furnish bark for 117,500 kilos, which, taking 4 per cent. as an average yield, shall be estimated as 2,937,500 kilos of bark. The necessity for increased payment for the bark is seen by the fact that in 1894, Java furnished 5,293,750 kilos of bark, or nearly sufficient for universal consumption. If these arrangements end in a contract, the French and American manufacturers, together with other English and smaller manufacturers, will be unable to obtain upon the market any but Indian, Ceylon, American and African bark. This would, of course, lead to a marked advance in the price of quinine, but whether the negotiations will be brought to a successful issue or not remains to be seen.—*The British and Colonial Druggist.*

Smoke.—The following from the *American Engineer and Railroad Journal*, seems worthy of mention : A mistaken idea exists as to the amount of actual carbon contained in those dense masses of smoke which are seen rising from the tall stacks of manufacturing and other large plants. By passing through water the gases arising from a furnace burning bituminous coal, and weighing the solid particles retained or precipitated, it has been proved, it is claimed, that they amount to less than six per cent. of the total amount of coal consumed. It is not strange that a different idea is entertained of the quantity of actual carbon seemingly going to waste, when the wonderful coloring power of the finely dividing particles of carbon is considered. To prove this, it is only necessary to try the well-known experiment of smoking a bit of glass with a candle, and then mixing up with a palette knife a portion of the coloring matter thus secured with a drop of two of gum arabic. A very small portion of this mixture will color many quarts of water. The actual carbon contained in the smoke itself is inappreciable, but the unconsumed invisible gases invariably associated with the smoke are considerable in quantity and indicative of a financial loss much larger than is generally known.—*The Popular Science Monthly.*

To Measure Shades of Color.—In a number of industries, preparing printing inks, color illustrations, mixing dyes, estimating the quality of petroleum, lard and flour, detecting the condition of steel in a Bessemer converter, and so on, it is of great importance to measure very delicate shades of color most accurately. As the result of twenty-five years' study of the problems involved and experiments with various methods of dealing with them, J. W. Lovibond, of Salisbury, England, has invented a device which is said to perform the desired work easily and accurately, although any one employing it successfully must, of course, possess a keen sense of color. In two tubes, placed side by side for comparison, are placed the article to be tested (either a powdered pigment or a liquid preparation) and a number of transparent colored glass plates. The latter are properly selected and added until the light transmitted through them exactly matches the hue of the dye or pigment; and then the numbers are read off from the plates and summed up, very much as one would ascertain the weight of an article by a set of sensitive scales. Standards having once been secured for each of the three primary colors (red, yellow and blue), more than 100 different degrees of intensity in each color are obtained in as many different plates or disks. By properly proportioning and mixing those representatives of the fundamental colors all the possible tints and hues that the eye ever saw can be reproduced exactly. A record of the disks used in so doing having been made, it is possible to transmit merely a numerical memorandum instead of samples, to ascertain whether subsequent purchases are up to the original standard, and to detect any fading or change of hue owing to time and exposure. Mr. Lovibond calls his instrument the "tintometer." — *The Pharmaceutical Era.*

Color Photography.—At a recent soiree of the Royal Society, in London, Dr. Joly, of Dublin exhibited some photographic transparencie upon glass plates representing various objects in their natural colors. The subjects photographed, were especially chosen because of the variety of color and delicate shading, and were reproduced with great naturalness and fidelity. The results were accomplished by the use of a finely ruled glass plate, two hundred to three hundred lines to the inch, each three lines being a complete color series, consisting of an orange-yellow line, a greenish-yellow line, and a blue-violet line; these colors being repeated over and over again. The lines are ruled with colored inks, made up of gum and gelatin mixed in certain proportions on a gelatin-coated plate. The plate to be exposed is placed in contact with this color-screen, and only exposed to light which has passed through the latter; an extra long exposure is necessary owing to the partial capacity of the color-screen. The plate is then developed in the ordinary way. The color-screen is now again placed against the negative, and then the two are held up to the light, if the color screen is placed just as it was when the exposure took place, an accurately colored reproduction of the original scene appears. The process is so simple and inexpensive that it will probably come rapidly into general use.—*The Popular Science Monthly.*

A useful bulletin, on the pasteurization of milk and cream for direct consumption, has been issued from the Agricultural Department Station of the University of Wisconsin. It is drawn up by Dr. H. L. Russell, the bacteriologist attached to the station, and contains much interesting matter. There can be no doubt whatever that the pasteurization of milk is a most important hygienic measure, destroying as it does an average of about 99.7 per cent. of the microbes present in milk, amongst which are the diphtheria and typhoid microbes, as well as those organisms associated with gastric and intestinal disturbances so common in young infants during the summer. It is claimed that the introduction of pasteurized milk among the poor people of New York, through the philanthropic efforts of Mr. Nathan Straus, has done much to reduce the infant mortality in that city during the hot summer months. The practical side of the question has not been lost sight of by Dr. Russell, and the results of his experiments on the efficient production and distribution of pasteurized milk on a commercial scale are carefully brought together. The subject is one of great importance, both from a hygienic as well as commercial point of view, and we may surely hope that before long our dairy authorities will take the matter up, and that we shall follow, though tardily, the example already set us by our neighbors in France and Germany, where pasteurized milk may be purchased across the counter.—*Nature.*

Among the deaths of eminent scientific men abroad, we notice the name of Dr. F. Hoppe-Seyler, professor of physiological chemistry, in Strassburg University, and also that of Dr. S. Moos, professor of otology in Heidelberg University.

The Royal Horticutural Society's Journal for August has in it several important papers. There is a report of the Primula Conference, held a short time back with the idea of increasing and improving the culture of the various species of Primula by procuring new plants from remote regions; by practicing the most successful methods of culture; and by producing hybrids. A paper on the botanical work done on the genus Primula since the last conference in 1886, was contributed by Mr. J. G. Baker, F. R. S., and this is printed with one on the culture and classification of Primulas, by Mr, H. Selfe-Leonard, and another on the Auricula, by Mr. J. Douglass. Among the other papers in the Journal, we notice a long and very valuable description of the plants and gardens of the Canary Isles, by Dr. Morris, C. M. G., and a paper on the culture of roses under glass, by Mr. F. Cant.—*Ibid.*

Science states that the Board of Scientific Directors of the New York Botanic Garden has recently resolved to authorize a topographical survey of the 250 acres of land in Bronx Park, which have been set aside for the uses of the garden. All the trees in the park are to be labeled, and new variety of seeds desirable for cultivation are to be secured.—*Ibid.*

The Royal Academy of Medical, Physical and Natural Sciences Havana, at a meeting held on April 28, decided to offer amongst other prizes, mostly for medical essays, one—the Cañongo prize, value $250 in gold, for the best essay on "The Pharmacological Study of the Fluid Extracts." The competition, which is open to any person whether belonging to the medical profession or not, will be closed on March 19, 1896, by which date all papers must be sent in, written in French or Spanish, and sealed, with a motto on the internal envelope, and in another envelope bearing the same motto, the author's name and address. The adjudication will take place on May 19, 1896, when the prizes will be distributed to the successful competitors. Further particulars may be obtained by writing to the Secretary, Dr. Vincente de la Guardia, Havana.—*Ibid.*

Bacteriology has taken up the telephone as a disseminator of disease, and may make necessary the adoption of some device by which the danger of infection from the mouth-piece, which many people allow to touch the lips, can be avoided, The medical journals of Paris are agitating the matter. — *The Popular Science Monthly.*

BOTANY.

PHARMACOGNOSY OF SOME RARE BARKS.

(Continued from September issue.)

8. Cortex Terminaliae Trejinae. The bark is quilled ; its outer surface is dark brown and uneven, while the inner surface is of the same color, and striped longitudinally. Remnants of the periderm are present. The parenchyma of the primary bark is composed of thin-walled, almost quadratic cells, between which a few bast fibers occur. Stone-cells are absent in the entire bark. The bast fibers of the secondary bark are mostly united into bundles. The lactiferous ducts are irregularly distributed. The medullary rays are composed of from 2 to 6 rows of cells, and extend into the primary bark, which contain tannin and starch.—9. Cortex Micheliae nilagaricae. The pieces of this bark are flat, and, in young bark, covered with a thin, dirty-white outer bark ; older pieces possess a much thicker outer bark. The periderm consists of several layers of cork tissue, between which sclerenchymatous tissue, parenchyma, cribriform ducts, and small groups of bast fibers occur. Stone-cells predominate. The primary bark consists of thin-walled parenchymatous tissue, containing many groups of stone-cells. Bast fibers are here but little represented. In the secondary bark the latter are grouped into bundles, which traverse the whole tissue in regular rows, interrupted only by the medullary rays. The bast bundles are inclosed by stone-cells. Resin and oil-cells are present in the bark. Starch granules are contained in the parenchyma and in the medullary rays, and tannin in the center.—10. Cortex Morae excelsae. The only specimen of this bark accessible to the author was quilled, and had, on its outer surface, a chocolate-brown layer of Cork. This piece was remarkable for its high specific gravity. The cork layer consisted of about 25 rows of sclerenchymatous cells. Next came the phellogen, and then the primary bark. In the latter could be seen groups of stone-cells of various dimensions. The bast fibers were also grouped in bundles. In the secondary bark the bast bundles are arranged in tangential order, accompanied by long crystalline fibers. Stone-cells were here less numerous than in the primary bark. The medullary rays were entwined, and consisted of from 2 to 3 rows of cells ; they contained tannin and starch granules. Resin cells, with brown contents soluble in ether and in alcohol, were found distributed throughout the bark.—11. Cortex Alchorneae Iricuronae. The flat pieces of bark are covered by a slightly fissured cork layer. Sclerenchymatous tissue prevails in the whole bark. In the periderm, layers of cork-cells alternate with parenchyma, the latter containing groups of stone-cells. But few remnants of the primary bark are visible. Very large groups of stone cells occur in the secondary bark, having the same general arrangement that occurs in the parenchyma of the periderm. The bast bundles are small. The medullary rays consist of two rows of cells, and contain starch granules and tannin. This bark contains tannin in considerable quantities. — 12. Cortex Hymenodyctii oborati. The quilled pieces possess, on their outer surface, numerous whitish, lenticular markings, and upon their inner surface dark dots. The periderm is composed of from 15 to 20 rows of quadratic cork cells. The parenchyma of the primary bark consists of nearly quadratic, thin-walled cells, which surround bundles of stone-cells ; the latter form an uninterrupted ring on the border of the secondary bark. The bast bundles usually occur isolated, but sometimes also in small groups. In the

secondary bark, the stone-cells are less numerous. The medullary rays contain 3 to 4 rows of cells, and, in places, widen out somewhat. Lactiferous ducts occur in the primary as well as in the secondary bark. Crystalline fibers and single crystals are found in the parenchyma of the secondary bark.—13. Cortex Anain. This bark is quilled, and possesses a thick outer bark. The latter is of a light-brown color, while the remainder of the bark is yellow. The inner surface is covered with a resinous exudation. The periderm consists of layers of cork cells, parenchyma, stone-cells, and bast fibers. The layer of cork cells, is traversed by a narrow band of sclerenchymatous tissue. A few resin cells, with yellowish-red contents, soluble in alcohol and in ether, are present in the periderm. The primary bark is mostly replaced by the outer bark, so that the phellogen is in contact with the secondary bark. In the latter the bast fibers are united into bundles, which are arranged in tangential order, accompanied by crystalline fibers. Stone-cells occur mostly in small groups. In this portion of the bark may be seen numerous, large, resin ducts.—14. Cortex Araribae rubrae. Flat pieces with very thick outer bark. Upon the inner side are crusts of a red coloring principle. The periderm consists of layers of cork cells and parenchyma. The thickened cork cells conduct a reddish-brown coloring matter. The phellogen is composed of 6 to 8 rows of quadratic cells. The parenchymatous tissue of the primary bark incloses a few groups of large, irregular, confluent stone-cells and a few bast fibers. In the inner portion of the secondary bark the bundles of bast fibers are arranged in radial rows; groups of stone-cells are here also present. The bast fibers are surrounded by crystalline fibers. The parenchyma cells contain a red, amorphous, granular coloring matter. The medullary rays, which consist of from 1 to 4 rows of cells, conduct also a coloring matter, which is insoluble in ether, alcohol, or chloroform, but soluble in the caustic alkalies and their carbonates, as also in mineral acids. Tannin is present in small quantities only.

NOTES ON VIBURNUM PRUNIFOLIUM AND VIBURNUM OPULUS.

L. E. Sayre, a member of the Research Committee C, Revision Committee of the U. S. P., has made some investigations of the problem presented to this committee by its chairman, Dr. H. H. Rusby, relating to the question of discrimination of these two barks. The author gives the structural characteristics of each of these two barks as follows (*Am. Jour. of Phar.*, LXVII, p. 387): A cross-section of the stem bark of Viburnum opulus under the microscope shows this structure: Immediately interior to the periderm are numerous irregular clusters of stone-cells. These are succeeded in the inner, or bast, layer by large clusters of bast fibers associated with a few stone-cells. These clusters are arranged in bands parallel to the surface of the bark, and are separated from each other radially by narrow, one- or two-rowed, straight, medullary rays. These clusters are also partly or wholly incased in thin-walled crystal cells, each usually containing a single crystal of calcium oxalate. The interrupted bands of bast fibers and stone-cells are separated from each other by rather broader bands of soft bast, in which also a few scattered stone-cells and bast fibers occur. Tests by means of ferric solutions show the presence of considerable quantities of tannin in the middle bark, in the soft bast and in the medullary rays.—A cross section of the stem bark of Viburnum prunifolium shows groups of stone-cells somewhat irregularly disposed, but no bast-fibers. These groups appear in this section rounded or somewhat elongated in a tangential direction, or sometimes irregular in outline, but in longitudinal view they appear mostly fusiform, and sometimes five or ten times as long as thick. The component cells are also of large size. The clusters of stone-cells occur both in the middle and in the inner layers of bark, but are larger in the latter. The medullary rays, which, in this species, are also straight and composed of one or two rows of cells, are much less easily traceable than in the former species, because the cells differ little in size and shape from adjacent parenchymatous elements. They are best recognized by means of iodine solution, their cells containing more starch than those of adjacent tissues. Cells containing stellate crystalline masses of calcium oxalate are freely sprinkled through the parenchymatous regions of this bark ; cells containing single crystals are rare or wanting, and there is no crystal sheath about the masses of stone-cells. Tannin is present in this bark, but apparently somewhat less abundant than in the former species.—The bark of the young stems or branches differ from that of older ones, in the fact that the stone-cells are in smaller groups. This is because in the old bark the earlier formed masses of stone-cells have been cut off by the secondary cork formation, and the later formed groups of stone-cells in the inner layers of the bark are of larger size than the older ones further exterior.—The bark of the root of Virburnum prunifolium differs from that of the stem chiefly in the fact that its groups of stone-cells are farther apart, and average somewhat larger in size. The outer bark is also thicker and more spongy in its texture.—*Merck's Report.*

Alumni Association.

'93 NOTES.

ANOTHER marriage! This time John Curtin Taylor, gone done it. The ceremony took place at the home of the bride's mother, Mrs. Rhoda Deurl, at Sterling Valley, N. Y., Wednesday, August 21, 1895. Mr Taylor is in business at Mexico, N. Y., and doing a large business. Long life and happiness to Mr. and Mrs. J. C. Taylor.

COMMODORE E. F. LOHR, (he wears a yachting cap) was a most enthusiastic spectator at the international races, which ended in such a muddle. The commodore replies to all quiries addressed to him with two words, and they mean everything. "Never mind, says the commodore, its all right."

"HAVE you the genuine castile soap?"

"Yes, sir; the genuine imported article."

"Let's see it!"

"Here you are, sir! Here is a five cent and here a ten cent piece."

"But it does not come this way? Does it?

Here is the bar as it comes, but we cut it, sir!

The prospective buyer examines the bar of soap for fully ten minutes, then ———

"Well, I guess it is; cut me off a five cent piece, will you?"

HARRY HELLER, the big, was seen on upper Second avenue, with his smaller, though better half. Heller is as funny as ever, and reports business very good with him.

MR. ARABON is with our past President, H. A. R. Graeser. W. Lotman with B. Craft, 125th street and Lenox avenue.

GEORGE JARCHOW is quite a prominent member of Yorkville's German Colony, where he is doing quite a business, and adds money to his purse and adipose to his bones.

MARCUS KING is the proprietor of a very pretty drug store at 1965 Third avenue. He is always glad to meet any of his old classmates. He gets the JOURNAL and expects to join the alumni later in the season.

F. M. & R. G. LAWRENCE, are doing business on North Second street, Brooklyn. R. G. was the noted orator of '93. His resolutions, propositions and general debates are surely not to be forgotten.

C. F. BOLDMAN has just returned from his long vacation in the Catskill Mountains, where he met Rich. Specker. Mr. Specker has made an extended trip, visiting the Falls, Montreal and Toronto. There was but one young lady at the mountain house where the boys stopped, and the question, who saw her first has not as yet been settled.

C. F. BOLDMAN is with Hass, 39th street and Fifth avenue, and Specker is with W. Kamulah, Hoboken, N. J. "One redeeming feature of Hoboken is, that you can get the JOURNAL there as quickly as in New York," says Specker, "and the JOURNAL with the class columns, are things I'm waiting very anxiously for." That's right, Dick! J. P. Carrol with Dr. King, 479 Third avenue, is the latest subscriber to the JOURNAL.

"Oh! don't you remember the class, my dear boys,"
"The class cry oft echoed through the town;"
"The girls they all loved it and smiled at us boys,"
"While the coppers they all trembled at our frown."

"Rah! Rah! Rah!"
"Ree! Ree! Ree!"
"N. Y. C. P."
"Ninety-three"
"Boom a lacker Boom a-lacker,"
"Boom—Boom—Boom"
"Sis—Boom—Ah———"

J. TANNENBAUM, Ph. G.,
116 E. 116th street.

'94 NOTES.

"Penta! Meta! Boraci.
Illeo Secal, Pharmacy,
Phenol, Benzol, Carpophore
N. Y. C. P. '94."

ERE these notes are published, our Alma Mater will have again thrown open its doors and extended a hearty welcome to those seeking an up-to-date knowledge necessary to perfect them for the pharmaceutical profession. Latest reports indicate that the Junior Class will far exceed previous ones in number, due undoubtedly to unsurpassed facilities now offered, both in addition to the Faculty and a building which is absolutely perfect.

PHARMACEUTICAL jurisprudence being a subject of the utmost interest to the pharmacist, the Hon. Geo. F. Roesch's lecture Wednesday evening, Oct. 9, should be well attended. His experience as a challenger for our rights will enable him to furnish us with some interesting information. "You can spare the time. Won't you come, and afterwards have a pleasant chat with some of your college chums who will be present?" So many familiar faces make one feel as though he were again a student.

No class has been so often complimented for fidelity as '94, over 20 per cent. of which are active members of the Alumni. One of the most earnest workers being Hieronimus Herold, who will soon be capable of playing a dual role in that of pharmacist and lawyer; as chairman of the entertainment committee on last Alumni Day, he clearly showed his ability as a connoisseur, thereby winning the appreciation of his fellow members, who place the utmost confidence in his ability to master mostly any task.

THE excessive warm weather of early September, together with the return of "The Pilgrims," served to encourage the poor pharmacists who have been complaining of the dull summer, especially in the "soft drinks" line. However, with such bright prospects as are predicted by the press, we ought to all develop an unusual amount of muscular tissue this winter by "punching pills."

COL. LOUIS B. WADE spent his short vacation in picturesque Owego, his home. Unlike most of the ambitious '94 boys, the Colonel does not yet think of enlarging his "submaxillary area" by the study of medicine.

MAX AUERBACH has passed the first year's examination at the University of Pennsylvania. He has just finished his summer engagement with Wm. Schelles, of Sea Cliff. While at the seashore he made a mile in 2.08 on his Waverly. He will shortly leave to take up his studies in the Quaker city.

FRED. STOCK continues to practice in the store formerly controlled by his father on Seventh avenue near 30th street. Fred. is a cyclist of the old school, and devotes most of his spare time to his favorite amusement.

WURTHMANN and Krueder are preparing for their second year at P. & S. which opens early in October. Their progress up-to-date has been exceptionally creditable. Hereafter we shall refer to them as Doctors in our notes.

AFTER a careful study of the curriculum of several medical colleges, W. Arthur Bastedo has decided to take the P. & S. course. He will retain his position with Cassell and Massey indefinitely.

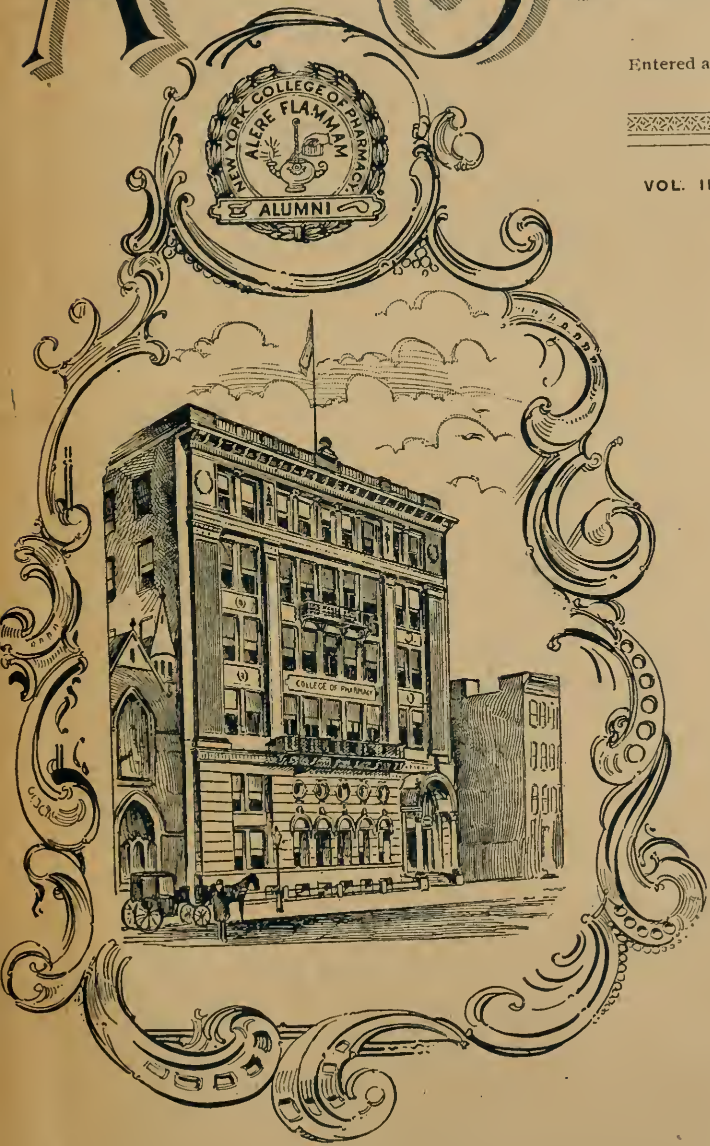
FRED. P. HILTZ is visiting in Norwalk, O., his home.

PAUL B. HUDSON is traveling for a New York druggists' specialty house,

I TAKE pleasure in reporting another benedict in Carl Richter, who, with Miss Daisy Lyons, as a companion, marched to the sweet strains of the popular wedding march from Lonengrin a short time ago. Richter is in business with his father in Fort Lee, N. J., and is doing quite well.

NELSON S. KIRK, Ph.G.
9 E. 59th Street.

The Alumni Journal



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PHARMACEUTICAL JURISPRUDENCE.

By Hon. GEO. F. ROESCH.

Delivered before the Alumni Association of the College of Pharmacy of the City of New York, October 9th, 1895.

Ladies and Gentlemen:—I must premise that the title of my remarks was not chosen by myself, but was furnished to me ready-made. My personal choice would have resulted less ambitiously. Likewise I do not hope to be able to submit an exhaustive presentation of the matter in hand, but rather cursory thoughts and incomplete notes which may lead to further and more satisfactory labors and results.

Jurisprudence has been defined to be "the practical science of giving a wise interpretation to the laws and making a just application of them to all cases as they arise." Pharmaceutical jurisprudence may be defined as that body of written and unwritten laws which affect the transactions of patients and the general public in their dealings with those skilled in the art and practice of preparing and preserving drugs, and of compounding and dispensing medicines. No doubt the codes of civilized countries have at all times contained provisions for the regulation of the practice of pharmacy. Shakespeare, the "myriad-minded man," as Coleridge terms him, makes us acquainted in Romeo and Juliet with the laws of Mantua. He gives us, too, a vivid picture of an ancient druggist and his shop. Romeo has just been informed of the death of Juliet. He seeks in self-destruction reunion with his lost beloved.

> "I do remember an apothecary,—
> And hereabouts he dwells,—which late I noted
> In tatter'd weeds, with overwhelming brows,
> Culling of simples; meagre were his looks,
> Sharp misery had worn him to the bones;
> And in his needy shop a tortoise hung,
> An alligator stuff'd, and other skins
> Of ill-shaped fishes; and about his shelves
> A beggarly account of empty boxes,
> Green earthen pots, bladders, and musty seeds,
> Remnants of packthread, and old cakes of roses,
> Were thinly scatter'd to make up a show."

Romeo calls on the apothecary and asks him for "a dram of poison." The latter answers: "Such mortal drugs I have; but Mantua's law, is death to any he that utters them."

But he gives him the poison, saying:

"My poverty, but not my will consents."

The wily apothecary wished to avoid the charge of a criminal intent in breaking the law.

The description of an ancient apothecary shop would hardly do justice to the modern palatial pharmacy, and the very appearance of my audience is a complete refutation of any suspicion that the personal description of the ancient apothecary is applicable to the pharmacist of modern times.

The real foundation of the office of apothecary in England, was laid in 1543, in an Act of Parliament, 34 and 35, Henry VIII, ch. 8. Its preamble speaks severely of the ignorance and cupidity of London surgeons, and then, as a remedy, provides for the toleration and protection of irregular practitioners who afterwards, as a body, became known as apothecaries.

It is interesting in view of modern prosecutions of druggists for selling remedies without a physicians' prescription, to notice that this act distinctly ordains "that it shall be lawful to every person, being the King's subject, having knowledge and experience of the nature of herbs, roots and waters, or of the operation of the same by speculation or practice, to practice, use and minister in and to any outward sore, wound, swelling, etc., according to their cunning, experience and knowledge and without suit, trouble or penalty." So that the skill of the apothecary could, without hindrance be called into service in a quasi medical capacity by the people of those days.

I cannot, within the limits of these remarks, present an historical review of the laws of other countries touching druggists and their status towards the medical profession and the public, and must content myself for to-night with a practical treatment of my subject, leaving possibly, to another occasion a more detailed account.

The practice of pharmacy is now regulated in this State by Art. XI, of Chap. 661, of the laws of 1893, being an act in relation to the public health and forming chapter 25 of "the public health law." It provides for a State board of pharmacy, excepting the counties of New York, Kings and Erie, of five members, each to hold office for five years from the first Tuesday of September of the year in which such term began.

The New York State Pharmaceutical Association at each annual meeting nominates five resident pharmacists of the State, outside of said counties, from which number the Governor fills each vacancy happening after such nomination. The members of the board take the usual oath and meet annually on the first Tuesday of September, at noon, and elect a president, secretary and treasurer for one year. Other meetings are held at least once in three months. The board makes by-laws and regulations for the examination of applicants for licenses. There are two grades of licenses created, that of pharmacist, which confers the privilege of carrying on the practice of pharmacy, either on his own account as proprietor, or for some other person, and that of assistant pharmacist, which permits the holder to retail medicines and poisons, but not to compound physicians' prescriptions in the absence of the licensed pharmacist.

The board must examine applicants and grant licenses, keep a record of pharmacists and assistants, investigate complaints of violations of the law, bring such cases and all infractions of the penal code to the notice of the proper prosecuting officer, and render annually to the Governor and the State Pharmaceutical Association, a full statement of its receipts and disbursements. Any person who had four years' experience in the practice of pharmacy, previous to January 1, 1893, or holds a certificate of registration as a pharmacist by examination from any board of pharmacy legally created under the laws of this State, is entitled to become a pharmacist. Any person who has had two years' experience in the practice of pharmacy is entitled to license as an assistant pharmacist, each upon passing the requisite examinations. Any person who on May 24, 1884, was entitled to a license, but failed within 90 days to apply to the State board for a license, might, within 90 days after the passage of that act, on eight days' notice to the Secretary of the Board, have applied to the Supreme Court for an order directing the Board to issue such license, upon proof of good cause for such neglect. No person is entitled to a license as a pharmacist or assistant, unless he furnishes proof by his own affidavit or otherwise, in addition to all the other requirements of the law, that he is a resident of the city, county or district for which the Board to which he applies is created, or, if a non-resident, that he intends to practice therein, and that he has not applied for a license to, or been examined by, any other Board of Pharmacy of the State, and has not been refused a license within six months preceding. By that statute a fee of five dollars was to be paid to the State Board for a pharmacist's license, and three dollars for that of an assistant pharmacist. The license must be conspicuously posted in the licensee's place of business. No license shall be revoked except for just and sufficient cause, and no one may hereafter practice as a pharmacist unless a license has been granted by the State Board. The statute does not apply to practitioners of medicine who are not the proprietors of stores, and does not prevent them from supplying patients. Nor does it apply to wholesale dealers in medicines or poisons, nor to the sale of insect poisons, or substances for use in the arts, or to the manufacture or sale of proprietary medicines, or to the sale of the usual domestic remedies by retail dealers in rural districts. These remedies are defined in the act as those, a knowledge of the properties of which and dose, has been acquired from common use, and includes only such remedies as may be safely employed without the advice of a physician. A large number of them are named in the act. But the term does not include poisons requiring knowledge and pharmaceutical skill to safely dispense, unless they are sold in original packages or such as bear the label of a licensed pharmacist. This act itself also furnishes us with a definition of the term "practice of pharmacy" as meaning the compounding of prescriptions, or of any U. S. pharmacopœial preparation or of any drug or poison, to be used as a medicine, or to the retailing of any drug or poison except as in the act provided for. The law does not prohibit the employment of apprentices for the purpose of being instructed in the practice of pharmacy, but they are not permitted to dispense prescriptions or sell or furnish medicines or poisons, except in the presence and under the supervision of a licensed pharmacist. The article does not apply to the counties of New York, Kings and Erie, but a license duly issued by any legal board of pharmacy entitles the holder to a license or certificate of registration from any other Board upon complying with the formal requirements of the law. Any person violating any provision of the article forfeits $50 for every such violation to the county to be sued for and recovered in the name of the county by the State Board. It retains the cost and expenses out of all penalties, and one-half of the penalty goes to the county treasury. The expenses of the State Board are defrayed out of the fees, and the moiety of such penalties.

In the matter of Ward 10 Misc Rep. 424, Judge Herrick, at Albany, held that the act of 1893 was evidently intended to take the place of all statutes theretofore passed. Chas. W. Ward had failed to apply within the 90 days provided for in the act of 1893, and sought to compel the State Board to license him notwithstanding that fact. Judge Herrick denied his motion, and held that no period is prescribed within which a person must apply for a license who has had four years' experience in the practice of pharmacy, previous to January 1, 1893. But as to those qualified under the act of 1884, who failed to make application within 90 days after the passage of the act of 1893, there is no provision in the statute for obtaining a license except by passing an examination. But we must take into consideration the amendments passed by the Legislature of 1895. By the act which went into effect on June 4, 1895, any person who has had four years' experience in the practice of pharmacy, or holds a certificate of registration as a pharmacist, is entitled to a license as such, and two years' of experience will entitle him to be an assistant pharmacist, if otherwise qualified. The fees are made $10 for a license as a pharmacist from the State Board, five dollars for a license or certificate of registration after examination by other boards, and three dollars for a license as an assistant. The license from the State Board seems indispensable. I also understand that the last Legislature passed an act introduced by Senator Donaldson, requiring every licensee of the State Board of Pharmacy who desires to continue the practice of his profession to pay, annually, within 30 days from Nov. 1, a fee of one dollar, for which he shall receive a renewal to be displayed with the license.

The regulations of the local boards are readily ascertained, and they strive with the State Board to maintain a high degree of excellence as to the requisites of admission to practice in pharmacy. Those applicable to this city are found in the Consolidation Act. It cannot be denied that, as a consequence, the practice of pharmacy in our city has been placed upon a higher plane than it ever occupied in the past. The result is that to-day, the pharmacists of our city are as a body, well educated, skilled and courteous gentlemen, devoted to their profession and alive to its importance as the handmaid of medicine, and the fruitful source of weal or woe in the community. The members of the profession, then, equally with laymen, are interested in proper legislative supervision of their calling, and, in fact, to them, rather than to others, is due the credit of existing legislation. They are as anxious as other citizens to surround the practice of pharmacy with all proper and effective safeguards for the protection of the public and the conservation of professional interests. It is, however, a matter of regret that legislation has not gone far enough to provide the means for keeping out of the profession those who are in the trade with their pelf as their only capital, and who often bring reproach upon the calling while contributing nothing towards its elevation.

The constitutionality of laws regulating the practice of pharmacy has been affirmed by the Supreme Court of the U. S. Judge Field in Dent vs. West Virginia, 129, U. S. 114, declared that "due consideration for the protection of society may well induce the State to exclude from practice those who have not such a license, or who are found, upon examination, not to be duly qualified." See also

State vs. Donaldson, 41 Minn. 74.
State vs. Farian, 65 N. H. 42.
People vs. Moorman, 86 Mich, 433.
State Board vs. White, 84 Kent. 606.

Of course these laws, like many others, which infringe upon personal liberty, may frequently in individual cases, because of their peculiar surroundings, work seeming injustice, but in the exercise of the police power of the State, in protection of the public health, their enactment has repeatedly been upheld by the courts. In England, in the beginning of the 18th century, the college of physicians prosecuted apothecary Rose successfully in the court of King's Bench, for prescribing a bolus for Seale, the butcher.

3 Salk. 16. 6 Mod. 44.

But apothecary Rose, insistent upon his rights—as apothecaries usually are—won on appeal to the House of Lords, 5 Bro. Parl. Cases 553, because the peers did not believe that every one should be compelled when sick, to call in "a physician to prescribe, an apothecary to dispense and a surgeon to let blood." But even their quackery drove the apothecaries to procure the passage of the act of 53 Geo. III. ch. 194. forbidding any one to practice without a license, and their courts, too, have ever since enforced laws similar to our own. The English apothecaries' act of 1815, just mentioned, is the parent of most of the American legislation upon the subject, though our laws exceed that statute in severity in the provisions of our criminal codes.

So, too, these laws in our country have been sustained in so far as they forbid others than graduates of certain schools to practice, requiring a certain period of residence in the State, permitting all actually in practice at the time of the passage of a law to continue to practice upon registration, but imposing certain burdens upon others, forbidding licensed physicians from conducting drug stores, except in compliance with the pharmacy law, and creating State boards of examiners.

Hewitt vs. Charier, 16 Pick, 353.
State vs. Vanderslins, 42 Minn. 129.
43 N. W. 789, State vs. Green.
112 Ind. 462, 14 N. E. 352, State vs. Hathaway.
21 S. W. 1081, State vs. Creditor, 24 Pac. 346.
Brown vs. People, 11 Col. 109, 17 Pac. 104.

Again, a license may be revoked for unprofessional conduct, or such other causes as the statute or the Board may prescribe. But the holder must have notice and an opportunity to answer the charges against him.

Gage vs. Censors, 63 N. H. 92-94.
State vs. Med. Ex. Bd. 32 Minn. 324.
People vs. McCoy, 125 Ill. 289, 30 Ill. App. 272.
State vs. Schultz, 28 Pac. 643.

So, on the other hand, a mandamus would lie to compel a board to grant a license if they arbitrarily and without just cause refuse it.

Harding vs. People, 10 Colo. 387.
Dental Exrs. vs. People, 123 Ill, 227.
People vs. Bellevue, 60 Hun 109.
State vs. Fleischner. 41 Minn. 69.

An unlicensed practitioner would not be entitled to exemption from jury duty. It is questionable whether he could maintain an action for slander if a jealous competitor would call him a quack.

Hargan vs. Purdy, 20 S. W. 432.
Skirving vs. Ross, 31 Upper Can. C. P. 423.
Collins vs. Carnegie, 1 A & E 695.

An unlicensed practitioner could not recover for prescriptions compounded by him and not paid for by his customers. Such cases would fall within the principle of Ferdon vs. Cunningham, 20 How. P. 154, Lauger vs. Unterbury, 9 Misc. 210, and Bloom vs. Soberski, 8 Misc. 311, that where a statute prescribes certain regulations compliance with them is prerequisite to recovery.

There are things which one may not do although he have a license.

If one prescribes under the guise of selling patent medicines or drugs it would constitute medical not pharmaceutical practice.

Alcott vs. Barber, 1 Wend, 526,
Thompson vs. Staats, 15 Wend, 395.
Smith vs. Tracey, 2 Hall, 465.
Underwood vs. Scott, 43 Kan. 714, 23 Pac. 942.
State vs. Doran, 109 N. C. 864.

On the other hand, a man was accustomed to gather herbs, was called doctor in his neighborhood, gave remedies to a sick friend, and advised him as a neighborly act without a fee.

He was not held to practice and was acquitted.

Nelson vs. State Ala., 12 So. 421.

The liability of a pharmacist is of a dual nature—criminal and civil. A criminal proceeding may be prosecuted against him and a civil action for damages brought at the same time. Nor can he by a settlement of the latter, expect to compound the former, for that might in itself amount to a felony.

The criminal liability is that defined in the Penal Code, and in the Consolidation Act of the City of New York.

It is well to bear in mind that Section 29 of the Penal Code makes every one a principal in the commission of a crime, whether he directly commits the act, aids or abets in its commission, is present or absent, or directly or indirectly counsels or procures another to commit it.

Section 191 prescribes that a person who provides, supplies or administers any medicine, drug or substance, or uses or employs or causes to be used or employed any instrument or other means for improper purposes, unless necessary to preserve the life of woman or child, is guilty of manslaughter in the first degree, punishable by a term of imprisonment not exceeding twenty years.

Section 200 provides that a physician or surgeon who in a state of intoxication, and without a design to effect death, administers a poisonous drug or medicine, is guilty of manslaughter in the second degree, punishable by imprisonment for a term not exceeding fifteen years, or a fine of not more than $1,000, or both.

There is no such provision with reference to pharmacists. There would, then seem to be tacit legislative recognition of pharmaceutical sobriety.

Section 217, sub-division 2, ordains that administering any poison or other destructive or noxious thing, so as to endanger life, or causing it to be taken by another, is termed assault in the first degree.

Section 218 provides that administering a drug or medicine the use of which is dangerous to life or health with intent to injure or with intent to assist in, or make possible the commission of any crime, when not amounting to assault in the first is assault in the second degree.

Section 297 makes the manufacture, sale or giving away of an instrument, medicine or drug for unlawful purposes a felony.

Sections 318, 319 and 320, make it a misdemeanor to sell, lend, give away, exhibit or mail any instrument, article, recipe, drug or medicine for unlawful purposes, and allows the issuance of a search warrant in aid of the law.

Section 364 to 368 inclusive, provide severe punishment for counterfeiting trade marks, and apply equally to the sale, keeping or offering for sale, of goods represented as the product or manufacture of a person not the manufacturer.

In this connection, I call attention to the discovery by the Carter Medicine Co., a few weeks ago, of a counterfeit of its trade mark, "Carter's Little Liver Pills."

Several arrests were made, and, upon conviction, Justice Jerome, in passing sentence of three months' in the penitentiary, said: "The whole value of many of these articles lies in the trade-marks. Thousands and hundreds of thousands of dollars are spent annually in placing them before the public. If the public cannot rely upon these articles, then a fraud is being practiced upon them, and upon the proprietary rights of those persons who own trade-marks.

This is a class of cases upon which this court does not look with any leniency whatever.''

The court did not intend any sarcasm, but the whole value of many of these articles does lie in the trade-mark, not in the compound itself.

Sections 401 to 405, relate to the omission of apothecaries to label drugs, or labeling them wrongly, and compel a druggist to keep a poison book in which must be recorded the name and residence of the person receiving the poison, together with its kind and quality, and the name and residence of a witness, unless sold upon the written order or prescription of a physician, whose name must be attached to it. The poison book must be submitted to the inspection of any person upon reasonable demand during ordinary business hours, and the refusal to do so is punishable by a fine not exceeding fifty dollars.

A poison must be labeled, unless sold upon such order, with the word ''poison'' and have its name written or printed upon it.

No one employed in a drug store is allowed to prepare a medical prescription unless he served an apprenticeship of two years, or is a graduate of a medical college, or college of pharmacy, except under the direct supervision of some person duly qualified; nor is it permissible to prepare a medical prescription except under such supervision. The penalty is a fine not exceeding $100, or imprisonment not exceeding six months.

If death results, the person offending is guilty of a felony punishable by a fine of not less than $1,000, or more than $5,000, or imprisonment of not less than two years or more than four years, or both fine and imprisonment.

Sections 407 and 408 punish the adulteration of drugs and medicines, or selling, offering or exposing for sale, if for any cause unfit to be used, as a misdemeanor.

Sections 438 and 438a punish the use of false labels upon any article as a misdemeanor.

Sections 580 to 584 inclusive, make the use and possession of false weights and measures or other apparatus, a misdemeanor.

The Consolidation Act of the City of New York, in §2015 makes it unlawful for any but a graduate or licentiate in pharmacy to open or conduct any pharmacy or store for retailing, dispensing, or compounding medicines or poisons in the City of New York, except as provided for in the act. But by the amendment of the laws of 1889, ch. 448, the widow or legal representatives of a deceased registered graduate or licentitate may continue his business if the actual retailing, dispensing or compounding of medicines or poisons be only by a graduate or licentiate in pharmacy.

The Penal Code §404, 725 and 726, did not repeal this section, and §405 merely relates to persons employed in a drug store and not to the proprietors.

People vs. Rontey, 21 N. Y. St. Rep. 173.
c. c. 4 N. Y. Suppl. 235, 51 Hun. 643.

Under §2016 no one can be registered but a graduate or licentiate, or a graduate having a diploma from some legally constituted medical college or society.

We are furnished with the definition of graduates and licentiates in §2017, which provides that graduates are those having at least four years' experience in stores where medical prescription have been compounded, and have obtained a diploma from any college of pharmacy in the country, or from some authorized foreign institution or examining board.

Licentiates are those who have had a like experience and passed an examination either before the board established on March 28, 1871, or before that created by ch. 817, of the laws of 1872. Foreign pharmacists who present satisfactory credentials or certificates of their competency and qualifications to said board, may also be allowed to practice as such.

Junior assistants or apprentices are not permitted to prepare physicians' prescriptions.

In §2018 the College of Pharmacy is called upon to elect on the first Monday in April of every third year at a special meeting, five competent pharmacists, of whom three shall be graduates of a medical college, and two of a college of pharmacy in this city, to constitute the Board of Pharmacy. Within thirty days after their election, they take the oath and then hold office for three years, and until their successors are duly elected and have qualified. If there be a vacancy, the trustees of the college fill it from two or more nominees elected at a special meeting of the college. The board elects a president and secretary, and must meet at least once every three months and three members constitute a quorum. The board must transact all business pertaining to the legal regulation of the practice of pharmacy in this city, examine and register pharmacists, and after satisfactory examination furnish certificates of competency upon payment of a fee of five dollars.

In §2019 it is made the duty of the secretary to keep a book of registration of the names and places of business of persons affected by the law. All must register and pay a fee not to exceed two dollars for pharmacists, and one dollar for assistants. The moneys received defray the expenses of the board, and any surplus is for the benefit of the college. The salary of the secretary is fixed by the board and paid out of the registration fees. Every registered pharmacist is to be held responsible under §2020 for the quality of all drugs, chemicals and medicines he may sell or dispense, except those sold in the original packages, and patent medicines, and should he knowingly, intentionally, and fraudulently adulterate or cause to be adulterated such drugs, chemicals or medical preparations, he is guilty of a misdemeanor, and liable to a penalty not exceeding $100, and in addition his name is stricken from the register.

No person is allowed, according to §2021 to retail any poisons enumerated in the two schedules annexed to it, and which are well known in drug stores.

In § 2022 it is declared that nothing contained in the foregoing sections applies to medical practitioners who do not keep open shop for retailing medicines and poisons, nor to the business of wholesale dealers. But the preceding section and its penalties do apply to them.

Under §2023 any one who attempts to procure false registration for himself or another is liable to a penalty not exceeding $500. A registered pharmacist who permits a person not registered to compound and dispense prescriptions, or any person not registered who keeps open shop for such purpose, or fraudulently represents himself to be registered, or any registered pharmacist or dealer in medicines who fails to comply with the law in relation to poisons, is deemed guilty of a misdemeanor, and liable to a penalty of $50.

Pursuant to § 2024 the penalties recovered are paid to the trustees of the College of Pharmacy and expended for the benefit of its library. I did not, however, find any provisions in these sections for procuring their enforcement. This is to be deplored, not alone for the sake of the College and its library, but of the profession itself. It might be well if the recent wholesome investigations into the adulteration of milk were extended to drugs and medicines. It would, furthermore, be extremely advantageous if some such officer of the city government as the corporation attorney were required to institute and conduct prosecutions under these sections.

As to the civil liability of pharmacists, the sparseness of litigation concerning it is a powerful testimonial to the painstaking care and professional skill of the druggist of to-day. Almost every vocation in life furnishes far more occasion to the courts for the definition of personal rights, and obligations arising out of allegations of negligence, than does that of the pharmacist. The law books are full of cases touching the alleged incompetency of men of other professions, while the instances in which an apothecary appears as a defendant on account of unskillfulness are comparatively rare. It is true that in more recent years some grave questions have arisen and caused some volume of litigation. But these, in the main, relate, as it were, to the purely mercantile side of the calling as regards proprietary medicines and the like, and not to any difficulties arising out of the compounding of prescriptions.

The question has been submitted as to who owns the prescription.

Our courts have not yet had opportunity to pass directly upon it, and it remains purely academic.

Prof. Ordronaux in his "Jurisprudence of Medicine," p. 291, indulges in a learned and profound discussion of the subject. He does not claim any exclusive right of property in physician, patient or pharmacist. He is of opinion, that the first has a proprietary right, and the second a fiduciary ownership, but does not fix the status of the last. A pharmacist has no right to communicate to others the nature and ingredients of a prescription, for that would certainly fall within the spirit of the law which holds sacred the communications between professional men and their patrons. Justice Yates in Mills vs. Taylor, 4, Burr 2362, said: that ideas are free, and every man has a right to keep them and a right to make public and control their publication.

In Abernethy vs. Hutchinson, 3 L. J. Ch. 209, a lecture was held to be the private property of its writer whose publication he could enjoin. In Gee vs. Pritchard, 2 Swan, 402, a letter written to a friend was thus protected. In Morrison vs. Moat, 9, Hare, Ch. 241, the publication of a secret in the compounding of a medicine was prevented. In England in Yovatt vs. Wingard, 1 J. & W. 394, in 1820, an injunction was granted against making any use of or communicating certain recipes for veterinary medicines. Wingard while employed by Yovatt had access to his prescription book and copied them. Lord Eldon granted the injunction upon the ground that there had been a breach of trust and confidence. In these days of intellectual activity in various directions, when the press and modern inventions make private actions public property, the right to privacy has come to be recognized as a personal right of equal claims to the protection of the law with the time-honored rights to life, limb and property. The courts will prevent a breach of confidence or trust, and what might be termed an implied contract not to publish the results of mental processes intended solely for the benefit of him who seeks, and compensates for, their aid. The patient may be said to own the prescription because he paid for it. The physician owns it because he is its author, and he can prevent its publication, and enjoin its use by or for another than the patient for whom he prescribed it. The apothecary owns it in so far as he has a right to its retention in self-protection against charges of unskillful compounding or use of improper ingredients. The prescription itself is *functus officio*. A physician might print the words: "Not to be repeated" across the face of the prescription and thus raise an implied contract not to use it again. The prescription book is the property of the pharmacist as against all the world, but physician and patient, and he should in all cases insist upon the retention of the original and not of a mere copy. I understand that it has been held in Massachusetts that the sale of prescription books can be restrained, and that they are not subject to sale on execution to satisfy creditors' claims.

A prescription cannot be used again if the physician forbid it. In New York by the laws of 1887, ch. 636, refilling more than once prescriptions of opium or morphine, or preparations of either, in which the dose exceeds $\frac{1}{20}$ grain, except upon the verbal or written order of a physician, is made a misdemeanor. If a patient puts up a prescription as a patent medicine and advertises it in the name of a physician, he might be liable to an action for libel.

Clark vs. Freeman, 11 Beav.112.

If a physician prescribes an overdose of a poisonous drug, and the druggist noticing that fact calls on the physician who directs him, notwithstanding, to dispense it, and the patient sustains bodily injury, or dies in consequence of the drug, both physician and druggist would be liable, though the latter is a lesser degree. The law does not compel a druggist to fill every prescription presented any more than is a physician compelled to treat every one who comes to him. If, then, a druggist, despite his conviction as a professional man, of its dangerous character, compound such a prescription, he, too, assumes a share in the risk and must abide by the consequences. His remedy is to refuse to fill it. It is his duty to be upon his guard against errors and he compounds them at his peril.

In Massachusetts a joint action was sustained against physician and druggist because of an erroneous prescription written by the one and filled by the other. 2 Hilliard on Sorts p. 297 note a. As Judge F. C. Brewster, said in Commonwealth vs. Bauer, Phila., Oyer and Terminer, April 1869, "if the exercise of reasonable care would have warned him that he was preparing something which would inevitable kill, it would be criminal for him to go on." But the negligence of the druggist must be established affirmatively. Mere inference will not suffice. The circumstances of each case must, however, be consulted. No universal rule can be formulated. But negligence has been declared to be the ommission to do something which a reasonable man, guided by those considerations which ordinarily regulate the conduct of human affairs would do, or the doing of something which a reasonable and prudent man would not do.

A druggist is often called upon to act *quasi* in the capacity of a physician. He runs the risks of prosecution if he does so. In later days such cases have become fewer, and the frequent prosecutions of the County Medical Societies have had beneficial results. On the other hand they have, with the aid of stool pigeons, often worked grievous wrong. But, as Justice Hawkins says in Apothecaries vs. Jones, 5 R. 101, "It is idle to lay down a golden rule upon the subject." The demarcations of each case must be noted, and the degree of liability becomes a question of fact.

The pharmacist is liable in damages for all injuries inflicted through his ignorance; unskillfulness or carelessness. He must know, *ex professo*, the properties of medicines and the proper doses, be fully equipped with the knowledge required by the standards of his profession, and keep abreast with the developments of materia medica in so far as they may come into service in modern pharmacy. The law does not require him to be an expert, but he will be held to warrant the purity of the drugs he employs in filling prescriptions, and that they are of the quality called for by the physician. See Ordronaux's Jurisprudence of Medicine p. 259. He must be conversant with the language of prescriptions and the means for detecting the quality of drugs. He must not grow rusty in his knowledge and the discoveries of the properties of nature's forces, together with the wonderful disclosures of modern chemistry must not be "a hidden book" to him.

A leading case in our State is that of

Thomas vs. Winchester, 6 N. Y. 397.

It was decided by the Court of Appeals in July, 1852. A jar had been labeled "½ lb. Dandelion, prepared by A. Gilbert, No. 108 John St., New York. Jar 8 oz." Gilbert was in the employ of Winchester and the labels were paid for by the latter, and used in his business with his knowledge and assent. The jar was sold to Jas. S. Aspinwall, a druggist in New York, as containing extract of dandelion. As a matter of fact it contained extract of belladonna. He sold it to Dr. Foord, a druggist in Cazenovia, Madison Co., New York. Mrs. Thomas had been taken ill and her physician prescribed extract of dandelion. Her husband went to Dr. Foord's drug store and was given some of the contents of the jar in question, in the belief that it contained extract of dandelion. Mrs. Thomas took the medicine according to prescription and as a result, her life was endangered. Upon recovering, she brought an action for damages against Winchester, the original seller.

She obtained a verdict and the wholesaler appealed. Chief Justice Ruggles declared that "the remote vendor of medicine upon which he has carelessly put a wrong label, and which, so labeled he puts upon the market, is liable for injuries resulting therefrom. This is so, although there be no privity or connection between such vendor and the person injured by its use. Every man is bound under the law to avoid that which endangers another." The court dwells upon the danger to the public because of unskillfulness or carelessness in the profession, and though there was no contract between the patient and the wholesaler, an implied contract was declared to necessarily exist, because of the danger to the public from mismanagement in the business.

So in England a chemist who negligently sold laudanum as paregoric, and caused the death of the person who took it, was declared guilty of manslaughter.

Tessymond's case, 1 Lewin's Crown Cases, p. 169.

In Kentucky, druggists were held liable for selling snake root for peruvian bark, and croton oil for linseed oil.

Fleet vs. Hollenkamp, 13 B, Munroe 219.

Hanford vs. Payne, 11 Bush 380.

In Michigan the druggist was held for his clerk's mistake in giving sulphate of zinc for epsom salts.

Brown vs. Marshall, 47 Mich. 576.

But a druggist is not responsible for the results though he sell a poisonous drug without labeling it, if in fact, he warned the customer of its properties, and the jury must pass upon the competency of the clerk and whether actual negligence was proven.

Mary Wohlfart sued druggist Charles A. Beckert for damages for negligence because his clerk had given her deceased husband a poison without the usual label. The clerk had warned him that the "black drops" asked for was a strong poison of which he should take only ten or twelve drops for a dose. He took ten times that amount, relying upon a friend who told him he had taken half a glass of what he called "black draught," and that it had cured him. It was admitted that the label was not on the vial.

The Court held that even though it is a misdemeanor to sell a poison without a label, doing so does not render the druggist liable in a civil action, if, before delivering it he fairly and fully warned him that the substance was poison.

Wohlfart vs. Beckart, 12 Abb. N. C. 478.

In Brown vs. Marshall, 47 Mich. 576, and Beckwith vs. Oatman, 43 Hun. 265, it was held that a failure on the part of the druggist or his clerk from whom the medicine was purchased to exercise due skill and care must be proved. Judge Cooley stated in the Michigan case that a high degree of care may justly be required, but that the Courts have not yet gone so far as to dispense with proof of actual negligence as a necessary element in the liability when a mistake has been made. Our Court of Appeals in Allan vs. State S. S. Co. 132, N. Y. 95, where a passenger sought to make the company liable for a mistake in the filling of a prescription aboard during a voyage, having been given calomel instead of quinine, though no actual negligence was shown, held that a person is not legally responsible for any unintentional injury from a lawful act when the failure to exercise due care cannot be imputed to him, and the burden of proving such lack of care when the act is lawful, is upon the plaintiff.

Losee vs. Buchanan, 51 N. Y. 476, 488.
Carpenter vs. Blake, 75 N. Y. 12.
Morris vs. Platt, 32 Conn. 75.
Simond vs. Henry, 39 Me. 155.

A man without a license may invest his money in a pharmacy, but cannot himself sell or dispense medicines.

Commonwealth vs. Johnson, 144 Pa. St. 377.
" " " 22 Atl. 703.
State vs. Morton, 67 Iowa 641.

In New York a conviction, in January, 1889, for opening and conducting a pharmacy for compounding and retailing medicines without due qualification according to law, was sustained by the Courts.

People vs. Rontey, 21 N. Y. St. R. 174, 4 N. Y. Supp. 235, 117 N. Y. 624.

A physician's description is in itself no defense if the druggist has no license.

Druggists' cases, 85 Tenn. 449.
Liquor case, 37 Am. R. 284.

In Georgia it has been held that whiskey is not a drug. The Court said: "We are old-fashioned and perhaps ignorant of the expansion of many words in modern use, amongst them the word 'drug.' It carries along with it an idea inseparable from it, of something repulsive, nauseous—at which the gorge heaves. Whiskey, on the contrary, is inviting, exhilirating."

Strange language from a sober Court!

It was also urged that goods hard to sell are often called a drug, and, therefore, to call whiskey, proverbially so easy to sell, a drug, would be in the language of the Court, "a palpable misnomer."

Gault vs. State, 34 Ga. 533.

I hardly think that Brother Roosevelt would admit the force if such a learned argument to dissuade him from his current crusade. One who prepares and sells drugs for medicinal purposes has been held to be a druggist.

Anderson vs. Commonwealth, 9 Bush 571.

It has been asked whether a proprietor is liable for damages when his clerk commits an error, the clerk being licensed. From the cases already cited such would seem to be the law. There is force, however, in the suggestion that when a Board of Pharmacy issues a license to an applicant and sends him forth into the world as a duly qualified pharmacist, such Boards of Pharmacy and their licentiates, rather than an employer druggist who relies upon such certificate of qualification, should be held responsible for the consequences of the ignorance or unskillfulness of the employee.

In State vs. Donaldson, 41 Minn. 74, it was held that the sale of borax by one not a pharmacist was not prohibited. But in Cook vs. People, 125 Ill. 278, the term "usual remedies" was defined as not including quinine.

These peculiarities must be relegated to the language of the statute in question in each case.

Gwynn applied to Druggist Duffield to compound a prescription calling for rhubarb. The latter took belladonna instead from a jar itself properly labeled. Gwynn, standing by, put his finger in it, took a small quantity from it and asked, was that a proper dose. The druggist answered affirmatively, Gwynn took it and suffered. The Court held he was guilty of contributory negligence in himself taking it from the jar and absolved the druggist.

Moral, keep your fingers out of druggists' jars!

Gwynn vs. Duffield, 61 Iowa 64, s. c. 47 Am. Rep. 802, 66 Iowa 708, 55 Am. Rep. 286.

If a druggist fills a prescription improperly he cannot raise the defense that the case itself was negligently treated.

Brown vs. Marshall, 47 Mich. 576, s. c. 41 Am. Rep. 728.

A pharmacist had recommended a prescription in good faith which had been given another. The customer ordered it, and the druggist furnished it, charging only for the medicines and their compounding. The customer sustained in jury and sued the druggist, but the Court held that he was not responsible.

Ray vs. Burbank, 61 Ga. 505, s. c. 34 Am. Rep. 103.

The safe course for a druggist when a customer calls for a remedy, is to give him what he may say he has been recommended to take and so asks for, but not to undertake himself to diagnose and prescribe for the case.

Where a druggist sells an article in itself harmless, but which in combination with other articles becomes dangerous, and is not informed that it is to be used in such combination, he is not liable for any damage which may result.

Davidson vs. Michels, 11 Allen (Mass.), 514.

A druggist sold a deadly poison as a harmless medicine to a man who bought it to administer to another who died after taking it. His widow was held to have a right of action against the pharmacist.

Morton vs. Sewell, 106 Mass., 143, s. c. 8 Am. Rep., 298.

The statute provided that "it should be unlawful for any person not a registered pharmacist to conduct any pharmacy or drug store."

It was held to be no defense that the sales were made by a clerk who was a registered pharmacist.

State vs. Morton, 67 Iowa, 641.

A policy of fire insurance covered drugs and medicines, and provided that it should be void "if the insured shall keep gunpowder, fireworks, saltpetre, etc.' It was held that this did not forbid the keeping of saltpetre as a drug, but only keeping it in such quantity and manner as not to increase the risk.

Collins vs. Ins. Co., 79 N. C., 281, s. c. 28 Am. Rep., 322.

Every pharmacy has some remedy of its own make. Often it is heralded as a panacea for every application. The domain of proprietary medicines is practically limitless. Humanity, always eager to escape its hereditary ills, greedily clutches at every compound that promises relief. The dealer is exposed to the danger of suits for damages for infringements. A medicine is usually patented by copyrighting the label, using a distinct trade-mark or name. The formula thus is not exposed, yet any infringement can be redressed. The mere name of a man is not the subject of a trade-mark.

A proprietary medicine must not, however, be put up in such colorable imitation of another as to be calculated to mislead an ordinary purchaser. The cases in the books upon the subject are too numerous for citation, but that is the pith of the decisions. I have not sought to digest this branch of the law for to-night, for it would in itself furnish sufficient material for an extended address.

The question of the power of the New York Fire Department to collect an annual fee of $2 for the manufacture, storage or keeping for sale of certain combustibles, was answered in the affirmative in 1884. Gustavus Miller was sued for a penalty for keeping ether on sale without a permit. The Court of Common Pleas, through Chief Justice Chas. P. Daly, after a review of the authorities held that the regulation was properly made by the Board of Fire Commissioners in the exercise of the police power for the security and safety of the citizens.

Mayor, etc. vs. Miller, 12 Daly, 496.

I cannot find that the case was ever taken to the court of last resort.

Within quite a recent period the pharmacist has suffered severely through the encroachments of the large department stores in cut rates and otherwise. There is no law in our State to afford relief, but there can be no question of the power of the legislature to act in the premises by way of reasonable regulation of the trade if necessary in the public interest and done without undue interference with private rights.

I thank you for the attention you have accorded to my presentation of my subject. The College of Pharmacy deserves the gratitude of the community for its magnificent work. Its Alumni Association fosters in its graduates the laudable ambition towards perfection in their profession. The aspiration of student days are kept alive and are nurtured by it amidst the busy cares of life. From their ranks have sprung and will yet come learned and noble physicians, whose skill and usefulness as such will in no small degree be enhanced by their education in pharmacy. Nor should there be any clash between their vocations. As handmaids of each other they should minister in the sacred cause of alleviating the suffering of mankind. Let us hope that intelligent and beneficent legislation, guided by scientific knowledge, practical skill and a high tand ard of professional morality and attainments will lend its aid. My labors will not have been in vain, if, encouraged by your motto, I have furnished a few faggots "to feed the flame."

Abies Balsamea.—By the distillation of the fresh twigs and sap of this plant an ethereal oil is obtained, which, according to Hunkel, has a specific gravity of .8759 at 20° and a rotary power of (a) $d = -32°.2$. It consists, apparently, of lævo-rotary pinene and lævo-rotary bornyl acetate.—*Apotheker-Zeitung.*

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THE ALUMNI LECTURES.

THE lecture delivered by the Hon. George F. Roesch, on Pharmaceutical Jurisprudence, marks the opening of a series of lectures to be given under the auspices of the Alumni Association during the present season.

The lecture, which attracted a large audience, was a resumé of the laws and their interpretation. The subject was treated in a clear and able manner, and will be read with interest and profit by many who were unable to be present at the lecture.

Among the many points that the lecturer brought forward, was the question of responsibility which the pharmacist assumes in dispensing a dose of a poisonous drug, which he knows to be excessive. Inasmuch as the dose of a drug within certain bounds is merely relative, it has always been held, that the physician, when he prescribed a larger dose of a remedy than is usually deemed prudent, if he at the time affixed some mark so as to show that he was aware of the poisonous dose and intended the same; or in the absence of any such mark, verified his prescription, when the excessive dose was pointed out by the pharmacist, assumed all the responsibility in case of the dose proving too large.

This, however, according to the learned gentleman's ruling, is not the case; he says: "If then, a druggist, despite his knowledge as a professional man, of its dangerous character, compound such a prescription, he too, assumes a share in the risk and must abide by the consequences. His remedy is to refuse to fill it."

This places the subject in an entirely new light, and makes the position of the pharmacist a very difficult one. Of course, where the dose ordered is palpably excessive, the only course for the pharmacist to pursue would be to refuse to dispense it, but, as often happens, a physician prescribes a quantity of a remedy at a dose, which is larger than is sanctioned by books of reference, and yet while not actually large enough to be absolutely fatal, might be attended with grave consequences in its administration. It is in these cases where the responsibility bears heaviest, and the position of the pharmacist as between physician on the one hand, and on the other, the possibility of a catastrophe in which he too would be liable for criminal action, is one that excites our heartiest sympathy.

THE next lecture in the series will be delivered at the College on the evening of November 13th, at eight o'clock, by Prof. H. H. Rusby. His subject, "Poisonous Plants in the Vicinity of New York City," will be profusely illustrated by lantern slides which will be accurately and beautifully colored.

This lecture promises to be one of the most important and interesting of the season, and all the members of the Alumni Association, members of the College, and the Class, with their friends, are cordially invited to be present.

WE regret to record the resignation of Mr. A. Henning, who has occupied the position of Business Manager of the JOURNAL since its inception, and to whose aid and energy the success of the JOURNAL has been largely made possible. We had hoped that he would reconsider his determination to resign, but the great amount of labor which the position entails, has been more than he could attend to, in connection with his other duties, and his resignation was at last reluctantly accepted by the Alumni Association at its last meeting. His successor has as yet, not been named.

A new test for Gurjun Balsam.—Hirschon, in a previous paper, gave two tests for the presence of gurjun balsam in copaiba. These were (1) 2 to 4 drops of the suspected sample are added to 1 to 2 c. c. of a solution of 1 c. c. of strong sulphuric acid in 25 c. c. of absolute acetic ether. A deep red or violet color results if gurjun be present; (2) 1 vol. of the balsam is well shaken with 3 to 4 vols. of boiling water, and filtered through a wet filter paper and an equal volume of hydrochloric acid added (1.120) a rose color is developed if gurjun balsam be present. He now gives a further test, which is claimed to detect 1 per cent. of the adulterant. One volume of the balsam is mixed with 3 volumes of alcohol (95 per cent.), and 1 part of crystalline zinc chloride. The mixture is heated until solution is affected. If gurjun be present, an intense red and then violet color appears.—*Apotheker-Zeitung.*

Detection of Sulphates, Sulphites, and Thiosulphates in the presence of each other.—R. Greig Smith recommends (*Ch. News*) the following method for the satisfactory separation of these compounds. The presence of thiosulphate having been indicated in the preliminary test, add to a dilute solution of the substance, solutions of barium and ammonium chlorides in excess, the latter for the purpose of facilitating the filtration of the barium sulphate. Hydrochloric acid is then added drop by drop, until it is evident that all the barium sulphite and thiosulphate are in solution, and only the sulphate remains. The solution is then filtered through a second moistened double filter paper. The filtrate must be perfectly clear. If it becomes opaque, the solution should be thrown out and a more diluted one used. To half the filtrate, iodine solution is added until a permanent yellow tinge is formed; a white precipitate then indicate a sulphite which has been oxidized by the iodine to sulphate, traces being more apparent by comparing the treated and untreated halves of the filtrate. They are then mixed, and more iodine having been added if necessary, bromine water is added to half, when thiosulphate is indicated by the formation of a white precipitate of sulphate of barium, caused by the conversion of thiosulphate to tetrathionate by the iodine, and oxidation to sulphate by the bromine. The absence of hydrosulphuric acid must be insured before carrying out this test by bubbling carbon dioxide through the solution.—*The Pharmaceutical Era.*

The Wiesbaden Laboratory.—The chemical laboratory of Dr. Fresenius was attended during the summer session of 1895 by 54 students. The contributions from various countries were as follows: Germany, 34; England, 4; Norway, 4; Austria, 2; Holland, Belgium, Australia, Switzerland, Italy and United States, 1 each.—*The Brit. and Col. Drug.*

THE MOST RECENT WORK.

A New Cinchona Alkaloid.—Dr. de Vrij, announces the discovery of a new alkaloid in the bark of cinchona ledgeriana. He says that "this alkaloid is found in small quantities in the bitter liquors of the tartrates of the alkaloids obtained in the analysis of this bark. The nitrate (of alkaline reaction) of this alkaloid is distinguished from that of the other alkaloids of cinchona by its sparing solubility in water. One part of the nitrate requires 1,000 parts of water at 15° C. It is different from the cinchonamine of Arnoud, in that it is easily soluble in excess of dilute nitric acid."—*Annales de Pharmacie*.

The Synthesis of Castor Oil.—Dr. Juillard, in a paper published in the *Annales de la Soc. Chim. de Paris*, claims to have affected the synthesis of castor oil from its components. His method is as follows: Into a glass flask 200 grammes of ricinoleic acid and 42 grammes of perfectly dry glycerine are introduced and heated to 120° C. The flask is then transferred to an oil-bath, and brought to a temperature of 230°, with constant shaking, so as to affect a very intimate mixture of the oil and glycerine. After six hours the flask is removed from the oil-bath and allowed to cool. The product of the reaction is then washed with water to remove unaltered glycerine, and with petroleum ether to remove unaltered acid. The residue dried at 100°, is a yellowish-brown oil, soluble in acetic acid and alcohol, but insoluble in petroleum ether. An analysis gave results which agreed with the body being a mixture of two molecules of triricinolein and one of diricinolein. The fatty acids on saponification of the oil have the characteristics of ricinoleic acid. It is impossible to judge of the value of this paper without some further details as to what the author really means. It is not clear whether he intends to affirm that he used pure ricinoleic acid or whether he means the total fatty acids of castor oil. Whichever he used, the result only agrees with the formation of glycerides, for a mixture of the two ricinoleins cannot be called "castor oil" in its proper sense, as it is not even definitely known to what the purgative action of the oil is due.—*The British and Colonial Druggist.*

NEW REMEDIES.

Bromopyrin is, as as its name implies, a bromine derivative of antipyrin. It is in fact, monobromoantipyrin. It forms white needle like crystals, very insoluble in cold water, slightly soluble in hot water and easily so in alcohol or chloroform. It melts at 114° C. This body, a true chemical compound, must not be confused with the specialty which was put forward under the same name, but which was merely a mixture of antipyrin, caffeine and sodium bromide. *Butyromel* is a mixture of two parts of fresh butter, and one part honey. The mixture is advocated as an excellent oil emulsifier, for use with cod-liver oil. *Caneroin* is a solution of neurine citrate and phenol. Rubrol is a solution of boric acid, thymol, and a coal-tar compound, which is not disclosed. It is recommended in cases of gonorrhoea. Chemically pure theobromine or dimethyl-xanthine, the diureide of cacao beans, is now an article of commerce. It is sold as fine white odorless crystals, fairly soluble in hot water and chloroform, and easily so in alkaline solutions. It is prescribed in powders of 5 to $7\frac{1}{2}$ grains four times a day. Thioform, or basic dithiosalicylate of bismuth is being recommended for eczema and similar diseases in the form of a dusting powder. It contains 72 per cent. of oxide of bismuth, and possesses the constitution

$$\left.\begin{array}{l} S.C_6H_3(OH)CO_2 \\ S.C_6H_3(OH)CO_2 \end{array}\right\rangle BiO.Bi\left\langle\begin{array}{l} O-BiO \\ O-BiO \end{array}\right.$$

Triformol is a polymer of formic aldehyde, now in common use under the name of formalin. Chemically, it is trioxymethylene $(CH_2O)_3$ It is a white powder which can revert to formic aldehyde in solution. It is a very powerful antiseptic.—*Ibid.*

The possibility of successfully boring for water in extensive areas of crystalline rocks has been demonstrated, we learn from the September number of *Natural Science*, at several places in Sweden. The experiments were suggested by certain conclusions of Nordenskiöld, based on the downward limit of surface variations of temperature and other physical considerations. He considered that vertical jointing of the rocks would not extend below 30 or 40 metres, and that at that depth extensive horizontal fissures must be formed. This has now been found to be the case, and from these horizontal fissures abundant water of great purity has been obtained. While these results are of practical importance) particularly with regard to the water supply of small rock islands), it also opens up a number of interesting general questions as to the flow of water in crystalline rocks.—*Nature.*

ON THE ELECTROLYSIS OF GASES.*

In the experiments described in this paper I have used the spectroscope to detect the decomposition of gases by the electric discharge and the movement of the ions in the opposite direction along the discharge-tube.

The method consists in sending the electric discharge through a tube so arranged that the spectra close to the positive and negative electrodes can easily be compared, the presence or absence of certain ions at these electrodes can thus be ascertained. This method is capable of much wider application than the one I previously used in my experiments on the "Electrolysis of Steam," (*Proc. Roy. Soc.*, vol. lii. p. 90), the use of which is attended with very great difficulty for any substance other than steam. The earlier method has, however, the advantage of being a quantitative method —the present one is only qualitative.

In my former experiment with steam, when I worked at atmospheric pressure, and varied the length of the spark, I found that when the spark-length exceeded a certain length, d_1, there was an excess of hydrogen at the negative electrode and of oxygen at the positive, equal in amount to the quantities of hydrogen and oxygen liberated from a water voltameter placed in series with the steam-tube. When the sparks were shorter than a certain length, d_2, the hydrogen appeared at the *positive*, the oxygen at the *negative* electrode, but the quantity of these gases was again equal to the quantities liberated in a water voltameter placed in series with the steam-tube.

When the spark-length was between d_1 and d_2 the effects were irregular, and there seemed to be no connection between the amount of gases liberated in the steam-tubes and those liberated in the voltameter.

In the following experiments in which the sparks were of constant length and the pressure was altered, corresponding effects were observed. Within certain limits of pressure definite and perfectly regular evidence of the separation of the ions of the gas sparked through was obtained; and the electrode at which a given ion appeared could be reversed by altering the pressure; there was, however, a range of pressures in which the separation of the ions was either not well marked or was irregular in character.

I shall begin by describing a very simple method of showing the separation of the ions produced by the discharge of electricity through a compound gas such as hydrochloric acid gas, which is applicable when the discharges through the constituent gases of the compound are of distinct and different colors; this is eminently the case with the hydrochloric acid gas, as the discharge through hydrogen in a capillary tube is red, through chlorine green.

Take a capillary tube of very fine bore, the finer the better (the tube I used was thermometer tubing of the finest bore I could procure), and insert platinum wires for electrodes in two small bulbs blown on the ends of the tubes; then fill the tube with HCl gas, allowing it to run through the tube for a considerable time so as to get rid of any extraneous gas, and exhaust the tube so that the gas in it is at a very low pressure. Then when a discharge from a large induction coil passes through the tube the following phenomena are observed: When first the discharge passes through the tube the color is uniform throughout and of a greenish-grey;after the discharge has been passing for a little time, the end of the tube next

*Paper read at the Royal Society, by J. J. Thomson, M. A., F. R. S., Cavendish Professor of Experimental Physics, Cambridge. Reprinted from *Nature*.

the cathode gets distinctly red, whilst that next the anode gets green; this difference in the color at the ends of the tube goes on increasing until the tube presents a most striking appearance, the part near the cathode being bright red, while that near the anode is a bright green. The difference in color attains a maximum value, and if the discharge is allowed to run for several hours, the contrast between the two ends disappears to a very great extent; the discharge throughout the whole of the tube being pinkish and apparently passing mainly through hydrogen. This is doubtless due to the diffusion through the tube of the hydrogen, which in the early stages of the discharge had accumulated about the cathode; one advantage of using very narrow tubes in that with them this diffusion is slow. When the tube is in this condition the color of the discharge sometimes changes suddenly, and for a second or two is green instead of pink, showing that though in the main the discharge passes through hydrogen, it occasionally leaves the hydrogen and passes through the chlorine. This transference of the discharge from one constituent to another of a mixture of gases is not infrequently observed when the gases are mixed in certain proportions.

Some of these capillary tubes showed after the discharge had been passing through them for some time a peculiar patchy appearance, some portions of the tube being a much brighter red than others, while other portions were green. In some tubes this occurred to such an extent that the discharge showed an irregularly striated appearance. This effect is due, I believe, to gases or moisture condensed on the walls of the capillary tube, and in some cases to irregularities in the chemical composition of the glass. I found that it did not occur if the tube before being used was heated for some time along its whole length to as high a temperature as it would stand without collapsing; this heating would tend to cleanse the walls of the tube. That differences in the quality of the gas also conspire to produce these patches is shown, I think, by the following phenomenon. A capillary tube of fine bore containing mercury vapor and a little water vapor developed a well-marked red patch; the tube was then heated for some inches in the neighborhood of the patch. In general, heating the tube makes the discharge yellow from the sodium vapor given off from the glass; in this case, however, the whole of the heated portion, with the exception of the patch, turned yellow; the patch itself withstood the heating and continued to show the bright color characteristic of hydrogen.

Electrolytic Transport of one Gas through another.—A tube was made of the finest bore thermometer-tubing; the extremities of the tube in which the electrodes were fused were bent down so far as to be parallel to each other, and so near together that a slight motion of the tube suffices to bring either of the extremities in front of the slit of the spectroscope. The tube was mounted on a board moved by a lever; by moving this the observer at the spectroscope could readily bring the spectrum of either the positive or negative electrode into the field of view. A side tube was fused to the middle of the main tube and was provided with two taps; in the space between these taps a small quantity of any gas which it was desired to introduce into the main tube could be imprisoned, and could, by opening the tap, be introduced into the discharge tube. The experiment consists in filling the main tube with a gas at a low pressure, observing the spectra at the two electrodes, then introducing by the side tube a very small quantity of gas into the main tube, and again observing the spectra at the two electrodes.

A tube was filled with hydrogen and showed no trace of the chlorine spectra; a very small quantity of chlorine was then let in through the side tube (in performing this experiment it is necessary to be careful that only a very small quantity of chlorine be introduced). After the discharge had been running through the tube for a short time, the chlorine spectrum was found to be bright at the positive electrode, though no trace of it could be detected at the negative. When the discharge was kept on for some time, the chlorine spectrum, though still visible at the positive electrode, got fainter; it did not appear at all at the negative. If a considerable quantity of chlorine was visible at both electrodes, though it was brighter at the positive than at the negative.

When the induction coil was reversed, so that what was before the positive electrode became the negative, the first effect observed was that the chlorine spectrum flashed out with great brilliancy at the old positive electrode, and was very much brighter than at previous period. This, however, only lasted for a second or two; the chlorine spectrum rapidly faded away and for a time was not visible at either electrode. Soon, however, the chlorine spectrum appeared at the new positive electrode, having thus been transferred from one end of the tube to the other.

On again reversing the coil, the same phenomenon was repeated. There is apparently no limit to the number of times this effect may be obtained; at any rate, I have driven the chlorine from the end of a tube to the other 14 times in succession by reversing the coil. The chlorine is always driven to the positive electrode, showing that the chlorine ion carries a charge of negative electricity. The same effect was obtained when a little vapor of bromine was introduced into the tube instead of chlorine. When, however, the capillary tube was filled with chlorine instead of hydrogen, and a little vapor of bromine let into the tube, the bromine went to the *negative electrode* instead of to the positive, as it did when introduced into the hydrogen tube. These experiments suggest that the two gases in the tube combine, and that the compound gas so formed, is split up into ions which travel along the tube, when, however, it is in combination with chlorine the bromine is the positive ion and travels to the negative electrode.

Another experiment tried was to let a little vapor of sodium into the middle of a capillary tube filled with air at a low pressure. To prevent the sodium vapor condensing on the walls of the tube, the whole was placed on a sand bath and the temperature raised so high that no condensation took place. After the discharge had run through the tube for about two hours the sand was removed from the tube, and the movement of the sodium vapor to the *negative* electrode was very apparent even without using a spectroscope, as there was a great patch of yellow light near the negative electrode and none in any other part of the tube.

Another experiment was to introduce a small quantity of hydrogen into a tube filled with air at a low pressure; the hydrogen made its way to the *negative* electrode. This experiment is a somewhat troublesome one, as it is exceedingly difficult to get these very fine capillary tubes so dry that the spectrum of the discharge does not show the hydrogen lines even before the hydrogen is introduced into the middle of the tube; indeed, I never succeeded in getting rid of the hydrogen lines at the very lowest pressure. By heating the tube and allowing dry air to run through it for a long time however, I got the tube so dry that it did not show the hydrogen lines at a pressure quite low enough to allow the discharge to pass freely through it. When the tube was in this state and hydrogen was let into the middle of the tube, the hydrogen spectrum appeared at the negative electrode, but not at the positive.

The appearance of hydrogen at the negative electrode when mixed in a discharge tube with other gases has been described by Mr. Baly in a very interesting paper in the *Philosophical Magazine*, vol. xxxv. p. 200.

The preceding experiments suggest, I think, that this separation of two gases, A and B, by the discharge is due to the decomposition by the discharge of a chemical compound formed of A and B, in which the atoms have a charge of electricity of one sign, the B atoms a charge of electricity of the opposite sign; these charged atoms under the influence of the electromotive force in the tube travel in opposite directions. Further, it follows from the experiment with the bromine vapor in an atmosphere of chlorine that the sign of the electrical charge on an atom of the same substance is not invariable, but depends on the substance with which this atom is in combination. We shall find numerous other instances of this change in the sign of the charge on an atom in experiments described in a later part of this paper.

Polarization of the Electrodes.—This in the electrolysis of liquids is due to the accumulation at the electrodes of ions which have ceased to act as carriers of electricity. We have, I think, distinct evidence of a similar accumulation in the electrolysis of gases. For, as has been already described, after the discharge has been running for some time in one direction, giving the spectrum of some gas at one of the terminals, the spectrum of the gas at that terminal is momentarily brightened to a very great extent by suddenly reversing the direction of the discharge. After the current has been flowing for sometime in one direction, through, say, Cl in an atmosphere of H, the spectrum of the chlorine, though still visible at the positive electrode, gets faint, the chlorine apparently to a great extent ceasing to carry the discharge; when, however, the current is reversed, the atoms of chlorine can move freely, as they are not obstructed by the electrode, so that immediately after the reversal of the current there is probably more of the discharge carried by the chlorine than at any other time, and the chlorine spectrum is consequently brightest.

Discharge through a Compound Gas.—The separation of the ions by the discharge can be readily observed in a tube which differs from an ordinary discharge tube merely in having a flat metal plate fastened across the tube. When the discharge passes through the tube, one side of the plate acts as a positive, the other as a negative, electrode. The tube is mounted on a stand, which the observer at the spectroscope can move by means of lever, so as to bring one side or other of the plate opposite the slit of the spectroscope; a very slight movement of the lever is sufficient to do this, so that the spectra at the two sides of the plate can readily be compared. I found that the results were more satisfactory when the current was kept flowing through the tube in one direction and the tube moved so as to bring the spectra at the two electrodes into the field of view than when the tube was kept fixed in one position and the current reversed. The latter method, however, suffices to show the separation of the ions in many cases, and it has the advantage of not requiring a plate across the tube; all that is necessary is to use for one of the terminals a disc whose plane is parallel to the slit of the spectroscope.

If the plate is thin, it is necessary to fuse it into the glass tube all the way round; otherwise, when the pressure is low, the discharge, instead of crossing the plate, goes through any little crevice there may be between the plate and the tube. The easiest way of making the tube is to use a plate about 0.5 cm. thick, cut from aluminium cylinder which tightly fits the tube; with a plate of this thickness the narrow spaces between the plate and the tube are so long that the discharge goes through the plate rather than through the crevices.

The tube was filled with the gas to be observed and the spectra at the two sides of the plate compared. These spectra were in many cases found to differ in a very remarkable way; it was, however, only in exceptional cases that a line which was bright at one side of the plate was absolutely invisible on the other. The method used was to take two sets of lines, say A and B, as close together in the spectrum as possible, and compare the brightness of these sets of lines on the two sides of the plate; if it was found that the A lines were brighter on the positive side of the plate than on the negative, while on the other hand the B lines were brighter on the negative side of the plate than on the positive, then it was inferred that electrolytic separation had occurred, and that the substance giving the A lines was in excess on the positive side of the plate, that giving the B lines on the negative. It is not safe to draw any conclusions from the variations in intensity of one line or one group of lines on the two sides of the plate, as the total quantity of light coming from the neighborhood of the cathode often differs considerably from that coming from the anode. When, however, we get an increase in the brilliancy of one set of lines accompanied by a diminution in the brightness of another set, when we move across the plate we eliminate this source of error. The differences in the spectra at the two sides of the plate are most easily observed at pressures where there is not any very great difference between the luminosity of the cathode and the anode. As was mentioned at the beginning of the paper, there is a range of pressure within which the effects are irregular, and no decided differences are observed between the spectra at the two sides of the plate. It is desirable in these experiments to keep the tube on to the pipe as long as the experiment lasts, for the discharge always decomposes the compound gas, and unless the products of decomposition are continually pumped off and replaced by fresh supplies of the compound gas, the spectra of the discharge keep changing. With organic compounds this is especially necessary, as the character of the spectrum often changes entirely very shortly after the commencement of the discharge unless fresh gas is continually introduced.

In the following experiments the current was produced by a large induction coil with a mercury slow break.

When the tube was filled with hydrochloric acid gas at a low pressure, the separation of the hydrogen and chlorine was seen very distinctly, the hydrogen line being very much brighter on the side of the plate which acted as the cathode (which we shall call the negative side of the plate) than on the positive side, while the chlorine, on the other hand, was brighter on the positive than on the negative side of the plate.

When the tube was filled with ammonia gas, the hydrogen lines were bright on the negative side of the plate, but were absent from the positive side, while on the positive side of the plate there was the positive pole spectrum of nitrogen, and on the negative side of the plate the negative pole spectrum of nitrogen and the hydrogen spectrum.

Sulphur Monochloride.—When the tube was filled with the vapor of this substance at a low pressure, the chlorine lines were brighter on the *negative* side of the plate than at the positive, while the sulphur lines were brighter at the positive side than at the negative. Thus the chlorine in this substance behaves in the opposite way to the chlorine in HCl; in the latter compound the chlorine ion has a charge of negative electricity, while in the sulphur monochloride it has a charge of positive electricity.

Influence of the Chemical Constitution of a Compound on the Sign of the Charge of Electricity on one of its Constituent Atoms.—In many organic compounds an atom of the electro-positive element hydrogen can be replaced by an atom of the electro-negative element chlorine without altering the type of the compound. Thus, for example, we can replace the four hydrogen atoms in CH_4 by chlorine atoms, getting successively the compound CH_3Cl, CH_2Cl_2, $CHCl_3$, and CCl_4. It seemed of interest to investigate what was the sign of the change of electricity on the chlorine atom in these compounds. The point is of some historical interest, as the possibility of substituting an electro-negative element in a compound for an electro-positive one was one of the chief objections assigned against the electro-chemical theory of Berzelius.

When the vapor of chloroform, $CHCl_3$, was placed in the tube, it was found that both the hydrogen and the chlorine lines were bright on the negative side of the plate, while they were absent from the positive side, and that any increase in the brightness of the hydrogen lines was accompanied by an increase in the brightness of those due to chlorine. The spectrum on the positive side of the plate was that called the carbonic oxide spectrum; when first the discharge passed through the tube, the spectrum on the positive side was the so-called candle spectrum, but this very rapidly changed to the carbonic oxide spectrum. The appearance of the hydrogen and chlorine spectra at the same side of the plate was also observed in methylene chloride and in ethylene chloride. Even when all the hydrogen in CH_4 was replaced by chlorine, as in carbon tetrachloride, CCl_4, the chlorine spectra still clung to the *negative* side of the plate. To test the point, still further, I tried the analogus compound silicon tetrachloride, inserting a small jar in the circuit to brighten the spectrum. The chlorine spectrum was again brightest at the *negative* side of the plate, while the silicon spectrum was brightest at the positive. This is a very favorable case for the application of this method, as there are two silicon lines (wave-lengths 5058, 5043) quite close to two chlorine ones (wave-lengths 5102, 5078), so that their relative brightness can easily be compared. The experiment with the silicon tetrachloride is more conclusive than those with the carbon compounds, as with the latter the spectrum on the positive side of the plate is a band spectrum, and since the potential gradient when the discharge is passing very much steeper on the negative side of the plate than on the positive, the effects observed might be supposed to be due to the circumstances on the negative side being better adapted for the production of the line spectra than those on the positive. This explanation is not, however, applicable to the case of silicon tetrachloride, where the spectra on both sides of the plate are line spectra.

From these experiments it would appear that the chlorine atoms in the chlorine derivatives of methane are charged with electricity of the same sign as the hydrogen atoms they displace.

When we can determine the signs of the electrical charges carried by the atoms in a molecule of a compound, we can ascertain whether any given chemical reaction does or does not imply interchange between the electrical charges on the atoms taking part in the reaction. Thus take the reaction.

$$CH_4 + Cl_2 = CH_3Cl + HCl.$$

If we represent the sign of the charge of electricity carried by an atom by + or — placed below the symbol representing that atom, we may write the last reaction as

$$\underset{-\,+}{CH_4} + \underset{+\,-}{ClCl} = \underset{-\,+\,+}{CH_3Cl} + \underset{+\,-}{HCl},$$

so that this reaction could be produced by a rearrangement of the atoms without any alterations of their electrical charges.

If, however, take the reaction—

$$\underset{+\,-}{HH} + \underset{+\,-}{ClCl} = \underset{+\,-}{2HCl},$$

we see that in addition to a rearrangement of the atoms there must in this case be an interchange of electric charges between the atoms; for before combination half the hydrogen atoms had a negative charge, and half the chlorine atoms a positive one, whereas after combination no hydrogen atom has a negative charge, and no chlorine atom a positive one. We may thus distinguish between two classes of chemical reactions, (1) those which do not necessarily require any interchange of the electrical charges carried by the the atom, and (2) those which do. It might, perhaps, repay investigation to see whether the occurrence of chemical change is affected by the presence of a third substance in the same way in these classes of chemical combination.

(*To be continued.*)

Senecionine and Senecine, mention of which have been made in this column before, are two alkaloids that have been isolated by A. Grandval and H. Lajoux ("1 *Union Pharm.*," XXXVI, P. 256) from Senecio vulgaris, a plant belonging to the compositae. Senecionine crystallizes with ease from its chloroformic solution, but the crystals are larger when produced from an alcoholic solution. They occur in the form of rhomboidal tablets. When kept in a vacuum, or under a bell-jar in the presence of sulphuric acid, they become anhydrous. One hundred parts of 85-per cent. alcohol dissolve 0 64 part of senecionine at 18 degrees C.; it is also soluble in chloroform, and very sparingly so in ether. It has a bitter taste, and a decidedly alkaline reaction, perfectly neutralizing all acids; but as yet its salts have not been obtained in crystalline form. It has a rotary power of 80.49 degrees, and a molecular weight. deduced from its saturating power, of 350.87; its composition is stated to correspond to the formula $C^{18}H^{26}NO^{6}$.

Senecionine, when treated with potassium ferricyanide and then with ferric chloride, yields Prussian blue. Treated with potassium permanganate and sulphuric acid, it assumes a violet coloration. It sometimes assumes a pink tint with nitric acid, but this is probably due to the admixture of a trace of the second alkaloid, senecine. Senecine may be obtained from the alcoholic mother-liquor of senecionine. It is much more bitter than the latter, It is soluble in ether, from which it crystallizes on evaporation, in fine silky bundles. Senecine forms with tartaric acid a crystallizable salt, which is but little soluble in cold water, but soluble in boiling water; its crystals are efflorescent. The corresponding seneconine salt has not yet been obtained in a crystallized condition by the authors. Senecine gives the following reactions: With sulphuric acid, first a yellow, then a reddish-brown color; with nitric acid, purplish-red, with a deep purple precipitate; sulphovanadic acid produces a purplish-brown coloration. Senecine possesses, in common with senecionine, the power of reducing potassium ferricyanide, and of producing a violet color with potassium permanganate and sulphuric acid.—*Merck's Report.*

Alumni Notes.

MINUTES

OF THE MEETING OF THE ALUMNI ASSOCIATION HELD IN THE ALUMNI ROOMS, OCTOBER 23, 1895.

The meeting was called to order by President Stover at 9 P. M. There were present Messrs. A. Henning, '76, Alfred Stover, '83, A. C. Searles, '84, Chas. F. Keale, '89, Louis Jacobson, '93, Julius Tannenbaum, '93, W. A. Hoburg, Jr., '93, Nelson S. Kirk, '94, and Geo. H. Jorgensen, '95.

Regularly moved and seconded that the reading of the minutes of the last meeting be dispensed with. Carried.

Mr. A. Henning reported as a committee of one on "Certificates of Honorary Membership" in the Association, subjecting two certificates for selection and approval; the report was accepted, on motion, and after a few minutes' discussion it was moved and seconded that the certificate reading "Honorary Member" be adopted; carried unanimously.

Mr. Joseph Aquaro, 68 Crosby st., City, Class '95, N. Y. C. P., having duly qualified, was this evening elected a member of the Alumni Association, N. Y. C. P.

A number of bills were presented for payment by the Treasurer, which being found correct, were ordered to be paid.

The final resignation of Mr. A. Henning, received some time ago by President Stover, was acted upon at this meeting. After some discussion and many sincere expressions of regret, Mr. Searles made a motion, that under the existing circumstances the resignation of Mr. A. Henning as Business Manager of THE ALUMNI JOURNAL be accepted, though with many regrets; motion seconded by Mr. Keale and carried.

Mr. Henning then extended his sincere thanks to Mr. Nelson S. Kirk for the valuable assistance rendered him in connection with his office as Business Manager.

Mr. Keale was then proposed as Business Manager of the JOURNAL, assisted by Mr. Kirk; nothing definite has as yet been decided upon, however.

The President appointed a committee of two, consisting of Messrs. Henning and Searles, to see about buying a piano, to be placed in "Alumni Room" for the amusement and entertainment of the members of the Association, and their friends and acquaintances, including the "girls," of course.

Motion made by Mr. Tannenbaum that, "a committee be appointed to look into the feasibility of holding a Reception and Ball this winter"; motion seconded and carried.

President Stover appointed Messrs. Tannenbaum and Hoburg, to act in this capacity.

There being no further business, the meeting adjourned.

Respectfully submitted,

W. A. HOBURG, JR., Sec'y.

'93 NOTES.

THE lecture on Pharmaceutical Jurisprudence proved a great success.

The Class was represented by Messrs. Boldnan, Hydeman, Lohr and Tannenbaum.

The Class cry, a la' mene-tekel-feres, was traced upon the black board and found many imitators. In a few minutes all other classes had their respective cries crowded on the board.

Those who had the misfortune to be absent will do well to read the lecture as it appears in the JOURNAL.

By a mistake of either the reporter or the printer, Mr. L. Amboss' name reads Arabon-Ach Louis!

SOME time ago a Newark Ph. G. literally fired a '93 man out of his store, for saying that '93 was destined to produce men of whom the profession at large would feel proud.

Where is that Newarker now? What would he say to this: Joseph C. Mayer, Assistant Demonstrator in the Organic Chemical Laboratory of the B. C. P., and Mr. Vrooman, Assistant in Pharmacy N. Y. C. P., eh?

R. PADDOCK is in business on De Kalb ave., cor. Clermont.

F. MILL'S name appears above the door at 1107 Fulton st., Brooklyn.

OTTO HYDEMAN, the latest aspirant for honors of M. D., is at the University.

HENRY SASSE (not saucy) after an unsuccessful effort to find a situation and "better half" in Montclair, N. J., has been engaged by F. Gundlach, 106th st. and Columbus ave.

HERE are a few peculiar definitions taken from a medical dictionary:

A "Druggist, an Apothecary—a Pharmacist, one who sells drugs and fills R.'s." Good, ain't it?—"Wei de Myers' Catarrh Snuff, a proprietary remedy composed of Sod. Chloride"; also definitions of Maltine, Hayden's Viburnum Co. Antipyrine, etc. Nothing is said of Antikamnia, Bromidia, Hood's Sarsaparilla, or Dr. Chase's Blood and Nerve Tonic (weigh yourself before taking).

Two Yonkerites are working for the title of Doctor, J. F. McCarthy for Phar. D., and H. O. Lawrence for Doctor of Medicine.

MAYER speaks of the number of boys who are eager for a reunion dinner.

H. Heller says, "the fact that he has failed, should not discourage us, but rather stimulate us to try again."

Can we have a dinner, boys? Let's see, how many will signify their willingness by sending their names to me.

J. TANNENBAUM, Ph. G.,
116 E. 116th st., City.

'94 NOTES.

"A FEW hours well spent," was the verdict rendered by the large audience which greeted the Hon. Geo. T. Roesch, when he delivered his lecture on Pharmaceutical Jurisprudence. The subject, which would ordinarily be a very dry one, on the contrary proved to be extremely interesting, due undoubtedly to the able manner in which the learned gentleman presented it. His remarks were of such a nature as to furnish food for thought to many which were subsequently discussed at length by cliques diffused throughout the building. For owing to Schuyler's good natnre the visitors were treated to an inspection of an ideal College of Pharmacy. His quick and witty repartee was received with applause not only from the Ph. G.'s but from the many ladies present. Mr. Seabury also livened the occasion with original remarks which were peculiar to themselves. I was particularly impressed with the good showing of the Undergraduates who are a very gentlemanly set of young fellows of superior attainments; they too contributed to the success of the occasion by their deviation from a general rule, *i, e.* by their exceptional quietness, unless a "war cry" was absolutely necessary. Our Roll of Honor consisted of Drs. Krueder and Wurthman, ex-Secretary Linnig, Messrs. Burger, Dauscha, Clark, Eely, Erb, Dawson, Davies, Grube, Stock Loveland and J. Remington Wood.

GEORGE F. BURGER is indeed an active alumnus, every meeting finds him present in his usual good humor; after the last lecture he led the '94 Glee Club in some choice up-to-date, and other selections, the choruses of which made the corridors of our Alma Mater ring with mirth. George is now located in Brooklyn, where he is thriving nicely on an atmosphere which he says contains at least 1% more oxygen than that of New York.

FRANK E. CORVES is again in the city. For the past year he has been doing considerable work in a New Haven pharmacy. He has entered '96 with a determined spirit which should carry him through with honors. He still remembers his '94 friends, several of whom he has visited since his return.

HARRY W. CROOKS continues to untiringly show his pharmaceutical ability in his father's store in Newark, N. J. 'Tis said he takes an active interest in politics.

EX-VICE-PRESIDENT KROEHBEL has concluded to again take up pharmacy. He has entered '97.

CHAS. L. VAN HUIS, who attracted considerable fame because of his association with "The Hall Quartet," is located in Elizabeth, N. J. Van can still do justice to the old familar "Stingling Wood."

F. G. HILLS and F. N. Pond have resumed the practice of pharmacy in this city. Both report as having spent an enjoyable summer during their respective rural engagements.

JOE KUSSY as bright and jovial as ever, was over to College at the last meeting. He is still with O'Neil, of Newark, where amid the hustle of that busy city he may be found as eager to sing the praises of his Alma Mater as in the days when he was '94's poet.

ASBURY PARK, this winter, will be the home of ex Vice-President Wilcox. Although quite busy during the season, he was able to combine pleasure with his duties at that popular resort.

N. Y. C. P. CYCLERS, Col. Wade, Race and Kirk, indulged in a 30 mile run on the 20th. Fast riding was the feature of the occasion.

PROF. RUSBY will endeavor to entertain us with "Poisonous Plants of the Vicinity of New York" as a subject, on Wednesday evening, November 13th.

NELSON S. KIRK, Ph. G.,
9 E. 59th st.

'95 NOTES.

WITH this issue there is a long silence broken, it being six months since our graduation, and no mention of our class having been made in this journal.

You might believe that with the end of our college life, we had also ended our column of notes, but no!

Fellow classmates have long been wishing to hear from one another, and as opportunity to hold a personal interview is not always to be had, they sought THE ALUMNI JOURNAL as a medium, but have heretofore been disappointed, as nothing in the way of '95 notes were to be seen, so therefore, from now on I will endeavor to supply this deficiency.

OUR Alma Mater has again thrown open its doors to students, and therewith enters upon the sixty-sixth year of its existence. This term will especially be marked, as it is the initial year of the Post-Graduate course.

LET us all hope that the college will henceforth thrive as it has in the past, and attain the fame of being known as the best college of pharmacy in the world.

Iso, Neo, Paraffine,
Morphine, Codeine, Narceine,
Ethyl, Methyl, Aldehyde,
N. Y. C. P. '95.

AS an introduction, let me give the cry. Now I will give you a lecture: Why were not all of you at the Alumni meeting?

A BOSTON man who had just returned from Virginia, had met some queer characters there, who were full of reminiscences. Meeting an ex-soldier of the "Lost Cause," he asked why the Southern Army did not swoop down on the Capitol at once after the Bull Run fight. He said: "Well, they say that the Washington papers received in camp, informed the boys that the city was overcrowded."

Now, certainly this was not the case with the lecture room, for there were plenty of vacant seats and our whole class could have "swooped" in, and yet there would have been accommodation for more.

Among the few present, I noticed Messrs. Steinheuer, Dauscha, Ferguson and Trau.

The lecture which was about pharmaceutical jurisprudence, and was delivered by the Hon. George F. Roesch, deserves recognition.

The subject was well chosen and proved to be extremely interesting. The only stumbling blocks at first, being to comprehend the legal terms used such as: Dr. Wellington Schuyler versus "The Boys," 18 State of New York, 95, but this hindrance was afterward seemingly overcome, at least, the boys looked as if they "knew it all."

BREVITIES.

RUDOLPH GIES and Henry Heutschel, have entered the ranks of the bosses, (not of Tammany fame). The former being located at 28th street and 3d avenue, the latter at 91st street and avenue A. Both are said to be doing well.

HERMAN WALTER is with Gies. Both employer and employee are taking the Post-Graduate course. Best wishes to our coming Doctors of Pharmacy.

IT will be painful news to hear that our ex-president Jesse J. Bailey, has suddenly been taken ill. He has left New York for Colorado Springs. Let us hope that he will soon recover and return to our midst.

WILLIAM HALL has become Bailey's successor at Bendiner & Schlesinger, 11th street and 3d avenue, and is in as good spirits as ever. I hear that in his leisure hours he is cultivating that baritone of his, which created such a sensation when first heard at the college.

HERBERT E. COOLEY is with his father at Batavia, N. Y. Dauscha is with Miller Bros., 48th street and 10th avenue. Boenke with Fred. Hohenthal, 52d street and 3d avenue. McClellan with Geo. Gill, at Mt. Vernon.

EX-VICE-PRESIDENT Harry B. Ferguson is with Parke, Davis & Co. His name can also be found among the faculty of the college as instructor in physiology, botany and pharmacognosy.

I WOULD like to hear from you all, so as to keep posted on your whereabouts, and you would greatly oblige by communicating with

THE '95 OBSERVER,
care of the College.

SENIOR CLASS NOTES.

FIRST MEETING.

THE first meeting of the senior class of '96 was called on Wednesday, October 9th, and the election of officers resulted as follows:

President, Murton J. Coats; Vice-President, Orrin F. Ives; Secretary, Thos. E. Butterworth; Treasurer, Geo. H. Carter. Reporter, section one, Jonathan Morris, Reporter, section two, C. Wetmore Smith. A vote of thanks was extended to the Junior president, Mr. Thornhill, also to the other officers of the junior class, who so faithfully performed the duties of their respective positions. We have no fear that our class made error in unanimously electing Mr. Coats as its leading officer, and each member should do whatever he can to give enthusiasm to the class of '96 of the N. Y. C. P.

DEUTSCHBERGER is the only man in the class who publicly advocates "protection." We hear the boys talk whiskers every day, but the feminine voices are as yet, unheard.

UNLIKE our predecessors, the class is already talking banner and class pin. It has been customary for the seniors of the college to make these purchases after the holidays, but why we should wait so long seems to be an idea with no good reason. We glory in the enthusiasm of our own officers. It's a good thing.—— —— ——

Do you notice those large pieces of ice our ex-secretary Finley has been cutting of late?

WE would feel grateful to the members of Section Two for any item they would deem of interest to our columns. The same should be handed to the reporter of the section, or mailed him before the 15th of each month. Letters can be addressed to 72 W. 49th Street, city.

WE wish in a few words to express our feelings of regret in being unable to meet Messrs. Prof. Jelliffe and Ferguson as our instructors in our senior class work. A feeling of close friendship seemed to be with us in our junior year, and that we must now part is only expressed with feelings of sadness. Yet, while we regret the loss of our junior instructors, we enthusiatically welcome our senior Professors, Messrs. Chandler, Oehler and Diekman, and the expressions of our feelings is an every day occurrence, and can be heard a block away.

C. WETMORE SMITH.

SECOND MEETING.

THE second meeting of the class was held Wednesday, October 16th, and action was taken in the matter of class pins. It was thought best to attend to this question at the present time rather than later in the year. It was voted that the President appoint a committee of three to obtain various designs with their prices and submit the same at the next meeting.

It was decided that the class extend a vote of thanks to Mr. Sewell Thornhill and other students who held office during the junior year.

THE meetings show a decided increase in attendance this year, and is encouraging to note the interest taken n all business matters.

MR. MERTON J. COATS, President, has two able-bodied men to support him in his work, Messrs. O. F. Ives and A. Deutschberger, Vice-Presidents.

IT has been suggested by several members of the class, that a colored ribbon be worn on the chain having the college colors with N. Y. C. P. woven in silk.

A NUMBER of class-mates and former graduates have urged the adoption of the old class pin of '91, '92, '93 and '94, which has already become associated with the college.

THE students in both sections have young ladies to compete with them in—all quizzes.

SOME of the students can give the average expressman points in smashing baggage, and the art of passing the hat, they have to perfection.

SCHUYLER says "What you Indians doing here?" At the same time he is wel aware of the fact that the lecture room is our destination.

JONATHAN MORRIS,
N. Y. C. P., W. 68th st.

NOTE. In our next issue, we shall commence a column of "Post Graduate Notes."—*Ed.*

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The Alumni Journal

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Vol. II. New York, December, 1895. No. 12.

THE POISONOUS PLANTS OF THE VICINITY OF NEW YORK CITY.

By Prof. HENRY H. RUSBY, M. D.

A lecture delivered to the Alumni Association of the College of Pharmacy of the City of New York, November 13, 1895.

After paying a tribute to the wisdom and public spirit of the New York Academy of Medicine in maintaining its great file of medical journals for the use of special students, and acknowledging his indebtedness to Mr. Cornelius Van Brunt, who had loaned many of the slides to be exhibited, the lecturer said :

Mr. President, Ladies and Gentlemen :

Little need be said in establishing the importance of the subject which I am presenting for your attention this evening. The frequent occurrence in large cities as well as in country and suburban districts, of serious and often fatal poisoning accidents, and the great importance of a ready knowledge concerning the poisoning agents on the part of every one likely to be brought into contact with such cases, particularly the pharmacist, who is most frequently appealed to for assistance, furnishes a sufficient warrant for the devotion of an evening lecture to this subject by the Alumni Association.

My remarks will be directed toward indicating the evidence which we possess proving that certain plants are poisonous, the conditions and circumstances under which poisoning accidents by them are liable to occur, their distribution in our vicinity, and their identification with that of such of their detached parts as are likely to effect poisoning. While reference will occasionally be made to the poisonous constituents and to the differential symptoms and treatment, our especial attention will be given to the considerations above mentioned. The cultivated plants of our gardens, except such as also grow wild, are mostly omitted, not because they are not in many cases of importance in this connection, but because the shortness of the hour compels us to exclude some portions of the subject. For the same reason I shall give less attention to those poisonous plants which furnish standard drugs and which are therefore supposed to be quite generally known.

For present purposes the best mode of treatment is to classify the poisonous articles into roots, barks, herbage, flowers, roots and seeds, each of these groups being subdivided into (a) those which are deadly poisonous and at the same time liable to cause accidents, (b) those deadly poisonous, but not liable to cause accidents, (c) those poisonous in minor degree, and (d) those not known to be poisonous, but of which we have some reason to be suspicious.

In the present instance I shall use the term "root" in its common, though incorrect sense, including all underground portions, rather than in its strict structural limitations.

SO-CALLED ROOTS.

Poisonous roots are liable to be eaten with other vegetables through accidental admixture, although this contingency is extremely improbable, and moreover the poisonous properties are in such cases often destroyed by cooking. More commonly they are mistaken for other edible roots, as Poke-root for horse radish. or in Europe, it is said, Aconite for horse radish. Even more frequently it is the result of the ignorant and promiscuous eating of roots in field or forest, commonly by children, either impelled by absolute hunger or by the peculiar erratic appetite of childhood. Occasionally the romantic notions derived from the reading of cheap literature will lead them to go into the woods and fields and feed upon unknown roots and berries, in imitation of explorers.

Poisonous articles of this class growing in our vicinity may be enumerated as follows: Aconite, Cimicifuga, Actæa, Podophyllum, Sanguinaria, Phytolacca, Robinia, Cicuta, Sambucus, Triosteum, Ipomœa, Solanum tuberosum, Apocynum, Euphorbia, Arisæma, Veratrum, Trillium, Leptandra, Iris, Convallaria, and Roripa Armoracia. Of these quite a number may be dismissed with the remark that while their properties indicate the possibility of their occasioning poisonous symptoms, such possibility, except by over-dosing or otherwise consuming in some medicinal form, are very remote and are not supported by any recorded cases which I have been able to find. In other cases the great acridity or otherwise unpleasant taste of many of them is a sufficient bar to their being eaten in ordinary cases. In spite of the latter fact, however, we do find that juvenile heroism is occasionally sufficient to overcome this objection, and to lead the subjects to eat what would be sufficiently repugnant to an older person. An important fact to be also noted in this connection is that most poisonous roots are far more active in a fresh condition, so that even those which have never been known to develop dangerously poisonous powers in medicinal forms, may do so if eaten in a perfectly fresh state. This class of articles then, which we may regard as poisonous in minor degree or "suspicious," comprises the following: Cimicifuga, Actæa, Triosteum, Leptandra, Ipomœa pandurata, Apocynum, Euphorbia, Arisæma, Trillium and Roripa Armoracia.

Cimicifuga, racemosa (L.) Nutt., commonly known as Black Cohosh, is a well-known medicinal and official plant. It is a beautiful perennial herb, growing to a height of six feet or more, with elegant long, branched, creamy-white plumes at the summit of the stem and branches. It grows very abundantly throughout the Allegheny region and is represented southward by other similar species. In this vicinity it is abundant on the mountains along the Hudson, and about Paterson and Orange. Its large rhizome is very characteristic and well-known to pharmacists. Its supposed active portion consists of resinous matter. In large doses, and particularly in a fresh condition, it is actively emetico-cathartic. In the same connection I will refer to the Actæas or Bane-berries, with rhizomes of strikingly similar appearance, and of properties almost identical. We have two species, both rather common in rich, damp woodlands, especially along streams and in the borders of swamps. A. alba (L) Mill. or white bane-berry, usually produces white, but occasionally red berries, while A. rubra (Ait) Willd, commonly produces red, but occasionally white ones. Of the fruits I shall speak hereafter, but mention now that as in the case of Cimicifuga, the history of the properties of these rhizomes shows that eaten fresh they might cause poisoning, though we have no definite record of such cases.

Leptandra, the rhizome of Leptandra Virginica (L.) Nutt., or Veronica Virginica L. is somewhat more active, the effects being otherwise almost identical with those last mentioned. Johnson in his Medical Botany of North America, says that it is too violently emetico-cathartic to be used with safety, even in medicinal doses, in the fresh condition, although it is commonly so used by the Eclectics. We may hence regard this as especially suspicious. The plant has a tall habit, similar to that of Cimicifuga, but in every way more slender, the leaves in whorls and with the beautiful spikes of flowers sharp pointed. Its rhizome is much more slender, elongated and branching than that of Cimicifuga, and the branches are articulated in a peculiar manner.

Another plant which may be similarly mentioned, is the Triosteum perfoliatum, L. which grows in the same general region and habitat.

Of Trillium erectum, L. or Birth-root, commonly pronounced "Beth-root," Lindley says the rhizome is violently emetic, and the fruit is to be regarded with suspicion. This plant is now extremely rare in the immediate vicinity of the city, but produces one of the commonest spring flowers of our northern regions. Its rhizome, though occurring in pharmacy, is not very well known. It is small, ovoid, short and chunky.

Apocynum, bearing the expressive common name of "Dogbane," is represented by two species, A. androsæmifolium L. and A. cannabinum, L. the latter being the more active, as well as much more common. It grows very commonly in waste places, along roadsides and railroads, and is characterized by a strong root which for at least its upper portion is erect. The other grows in more grassy places, the plants tending only slightly to become clustered, and it sends out several very long horizontal rhizomes near the surface. It contains several alkaloids; is a well-known and largely used laxative and alterative. In larger doses it is hydrogogue and diuretic, and in still larger doses powerfully emetico-cathartic with distinctly poisonous symptons, though no definite case of poisoning by it has been found recorded.

Ipomæa pandurata (L.) Meyer, or "Man-in-the-Ground," is found occasionally in Northern New Jersey and I think upon Long Island, although it is not likely to be encountered in the vicinity of this city. The nearest point where I have collected it is in the neighborhood of Blairstown, New Jersey. It is a prostrate vine of the morning glory class and produces an immense tuberous root, weighing many pounds. It contains a purgative resin, its properties similar to those of Jalap, though many times weaker, and it is certainly to be avoided as suspicious.

Euphorbia is an abundantly represented genus in this section, one species, the E. Ipecacuanhæ L., bearing a large, fleshy root, running down deep, often for several feet, in the sandy soil along our coast. It is noted for being probably the most variable species as to the form of its leaves of our local flora. Like its relatives it produces an abundant milky juice. Its specific name well indicates its ipecac-like properties. It was at one time very largely used instead of ipecac. No distinct case of poisoning by it is recorded.

The roots of various species of Asclepias may be referred to in similai terms. Arisæma triphyllum (L.) Torr., Indian Turnip, Wild Turnip or Jack-in-the-Pulpit, is well known to every one who visits our rich woods in spring and early summer. Probably all are also aware of the intensely acrid taste of its corm in the fresh state. Owing to this taste, there is scarcely a possibility of its being eaten, but if eaten in sufficient quantity it would doubtless produce severe inflammation. Its acrid properties are lost upon drying, heating or keeping.

Roripa Armoracia (L.) Hitchcock, the common horse-radish, likewise loses its irritating properties when heated or dried. These are almost identical with those of mustard, and while it would not generally be regarded as a poisonous article, yet used in excess it may become so through its powerful irritation of the urinary organs, by which it is excreted. Johnson gives a case in which this result was extreme and serious. It may therefore be borne in mind that it should not be consumed in inordinate quantity. This result, should it occur, would be found excruciatingly painful.

Before concluding the subject of suspicious roots, reference should be made to those of the Ailanthus glandulosus Desf. Dr G. K. Meschter of Worcester, Pa., reported in the *Medical and Surgical Reporter of Philadelphia* for 1872, page 159, a case in which four persons were apparently poisoned by this root. They were members of one family and were successively, that is, at intervals of a few days, attacked with no other possible cause than their drinking water which they took from the well of a neighbor. They all drank water exclusively, except the husband, who was the last to be taken. Others who drank of this water occasionally suffered similarly but to a slight extent. All immediately began to recover as soon as the drinking of this water was stopped. The symptoms, which had been slight for many weeks, appeared in a violent form in November, at which time an Ailanthus tree growing in the vicinity of the well must have shed its leaves, and to a great extent its fruit, also if a pistillate tree which fact was not stated. On examination the soil all about the well was found to be thickly permated with the roots of this tree, and these were also supposed to extend into the water, though an investigation regarding this was apparently not made. Inasmuch as the symptons had existed in a mild form before the fall of the leaves, it is fair to assume that the roots had contributed toward the result, while the violent outbreak in November would seem to indicate a sudden increase in the cause due to the accumulation ot the leaves in the well. The symptons were jaundice, a dingy aspect of the face and eyes, countenance fixed and anxious, pulse frequent and soft, yellowish fur on tongue, except on the tip and edges, tenderness over the liver, and most important, a persistent pain over the stomach with paroxysmal vomiting, pain in the back, difficult urination and obstinate constipation. The symptons were thus apparently to a great extent those of chronic gastritis. So far as this tree has been ex mined, it has been found to be poisonous only through its volatile oil, and this only by inhalation. Taken internally none of these effects have been observed, except in the case mentioned, where the condition was chronic. The symptoms of poisoning through inhalation of the volatile oil are said to be vertigo, vomiting and a peculiar shiver.

Several roots or root-like bodies will next be mentioned as unquestionably poisonous, yet for one reason or another not liable to become the occasion of accidents.

The effects of Sanguinaria Canadensis L., or Blood-root, are distinctly poisonous and Johnson definitely records that fatal results follow over doses. Yet the rhizome is not at all liable to be eaten, on account of its peculiar blood red color, which is forbiddingly suspicious, and more especially because of an exceedingly acrid taste which would render the chewing and swallowing of a poisonous quantity an act of heroism. It is exceedingly common throughout the northeastern United States, and in a number of localities within a few miles of this city. The picture displayed by the lantern is more effective than any description could be.

A simiiar position is occupied by the Podophyllum peltatum, L., Mandrake or May-apple, as regards its rhizone. Its taste, especially when fresh, is very repungent, and yet if eaten in quantities it would unquestionably prove fatal, as shown by the effects of over-dosage in medicine. In the *Philadelphia Medical and Surgical Reporter*, XIX, 308, a fatal case is recorded in which the evidence is perfectly clear that poisoning resulted from continued large doses administered by an ignorant and careless physician. The poisonous symptons were all referrible to the bowels, those of enteritis. It is also very interesting to note the peculiar effects of poisoning of the external skin by the powder and by the resin of this drug. It produces an ulcer of a very peculiar character, closely resembling one of venereal origin. Serious errors of diagnosis, leading to the gravest injustice to the reputation of the patient, have been known to occur in reference to these cases. A very serious ulcer upon the eye-ball is among these recorded cases. I shall have more to say upon this subject when considering poisonous fruits. The very greatly elongated rhizome of Podophyllum, with its very long smooth internodes, broadened nodes with their very large, low, cup-shaped scars, and sparse roots underneath, is doubtless well known to all pharmacists. The plant is not only very common, but extremely abundant east of the Mississippi, and is liable to be encountered almost anywhere. The only locality known in the immediate vicinity of this city is at Franklin, Essex Co., New Jersey.

Another rhizome whose acrid taste is likely to prevent ingestion in poisonous quantity, is that of the common Iris versicolor, L. Still, because this is commonly known as the Blue Flag, there is some danger that it might be eaten in mistake for Calamus, which is commonly known as Sweet-Flag. If so, it would prove seriously if not fatally poisonous, as its well-known emetico-cathartic properties, even when toned by drying and keeping, are powerful, and in a fresh state would be decidely violent.

Some very contradictory evidence is recorded concerning the poisonous properties of the common potato, Solanum tuberosum, L., and applying to all parts, the tuber, herb and fruit. Farther on I shall consider this subject, but note here that direct evidence appears in literature that small, young potatoes, as well as those which have been exposed to the light while growing, so as to take on a green color, are poisonous, although the poisonous principle in both is destroyed by thorough cooking.

I now come to the distinctly dangerous articles of this group,—roots and root-like bodies which are not only known to be fatally poisonous, but which are for various reasons liable to be eaten, and which have actually made records of this character. They are Aconitum, Phytolacca, Convallaria, Veratrum, Robinia, Cicuta and Sambucus.

The properties of the medicinal aconite, A. Napellus, are too well-known to require attention. The genus is referred to here not only because it is a common garden flower, and extremely poisonous, hence very likely to occasion accidents, but because we have a species, A. noveboracense Gray, growing along the Beaverkill in the Catskills, in a wild state. While its poisonous properties have not been investigated, evidence furnished by Mrs. Cornelius Van Brunt, of this city, shows that it is probably even externally an irritant poison. It is furthermore of interest that Mr. Van Brunt's observations show quite clearly that it is of comparatively recent introduction to that locality from farther west, hence likely to be introduced into other similar localities in this vicinity. The habit and appearance of the plant is well illustrated bv the picture. Its tubers are conical and not more than an inch or so in length. It is difficult for one to understand how such a tuber as aconite can be mistaken, as it is said to have frequently been in Europe, for the horse-radish. Mr. Holmes, of the British Pharmaceutical Society, thinks it may be due to the fact that the roots of horse-radish, after being ground down to a small, conical vestige with the crown attached, are then frequently planted.

The common Poke-root, Phytolacca decandra, L. is one of our most violently poisonous plants. Its poisonous and medicinal properties decrease continuously with drying and keeping, so that the chief danger resides in the fresh roots. Every one is familiar with the appearance of the growing plant, extremely common everywhere about the city along roadsides and in waste places, and one of the most handsome of all our native plants. However it is not at this time, that is, when full grown, that it is liable to occasion accidents. These usually occur in early spring, before the stems make their appearance, when the roots are dug, grated and eaten raw in mistake for horse-radish, which they somewhat resemble. As the young shoots make a delicious green, very similar to Asparagus, portions of the root are liable to be taken at the same time. If very thoroughly cooked their poisonous properties would be destroyed, but if the cooking were incomplete, fatal poisoning might result. The active constituent is a glucoside, phytolaccin, occurring in white, silky needles. The symptoms are tonic spasm of the muscles, especially of the hands and feet, these being rigidly fixed, the body strongly and rigidly bent backward and the respiratory muscles fixed and immovable, so that death results from failure of breathing. The preliminary syptoms are vomiting and purging, but as the vomiting comes on slowly, the first indication of treatment is to empty the stomach as promptly as possible, the stomach-pump being preferable. Three teaspoonfuls of the tincture of the root killed a child of six years in two or three hours. There is no excuse for mistaking this root if one has ever examined it, as the peculiar concentric arrangement of its tissues renders identification easy.

Convallaria majalis L. or Lily-of-the-Valley, is of course not spontaneous, but should be referred to in this connection because it is so powerfully poisonous and so commonly cultivated in gardens, and especially because its fleshy rhizomes possess a dangerously attractive, sweetish taste. This subject will be referred to again in considering flowers.

Veratrum viride Ait., Indian Poke or Green Hellebore, is a well known medicinal agent and has occasioned numerous poisoning accidents when given in overdoses for medicinal purposes. The nature of the poisoning, as well as the appearance of the plant, will be considered under herbs, but mention is here made of its conspicuous, fleshy, vertical, obovoid rhizome and fleshy roots, which might easily chance to be eaten for something else, or else under a misapprehension or in ignorance of their properties.

The poisonous properties of the common Locust tree, Robinia Pseudacacia L., and probably of other species of the genus also, will be considered under barks, but it is well to note here that its small roots have a thick succulent bark which has been made an article of consumption by boys, with serious results following. Dr. Johnson records the fact that such cases have resulted fatally, with symptoms very similar to those of Belladonna poisoning.

We come now to consider by far the most poisonous member of this class, the Cicuta maculata L., a root which has not only destroyed more lives than all the others which I have named combined, but which doubtless averages at least one victim a year in some part of the extensive area over which it grows in this country. It has moreover relatives abroad and elsewhere in this country, especially the C. virosa, which are equally pernicious. These species together furnish a page in the history of vegetable toxicology which is exceeded in point of importance by very few plants. It grows throughout the entire United States, with C. virosa extending northward and C. Californica upon the western coast. It occurs in swamps and other wet places, but very rarely upon high ground. During the early summer the salt marshes in the vicinity of this city, the swamps along the Hudson and upon Long Island and Staten Island, and all similar locations, are whitened with it. It is commonly known as Water-parsnip or Water-hemlock, and is also known as Spotted Cow-bane, Musquash-root and Beaver-poison. The important part of the plant for our consideration is the root, which is fascicled, fleshy-thickened and fusiform. It looks like a miniature fascicle of Dahlia roots and slightly like those of the Helianthus tuberosus or Jerusalem Artichoke. The individual roots are generally only an inch or an inch and a half in length and about half an inch in diameter, though they are sometimes double this size. Poisoning by it has almost always occurred in the spring, when children have a greater tendency than at other times to roam the woods and swamps, are more readily attracted to growing objects and, starved by the winter's abstinence from succulent foods, are ready to experiment upon anything which looks inviting. A few cases are here given in order to indicate the characteristics attending poisoning by it.

Dr. Richard Hazeltine, of Lynn, Mass., has reported in the *New England Journal of Medicine* a case resulting in prompt death, the root having been identified by the celebrated botanist Dr. Bigelow. The symptoms were tremors, violent contractions and relaxations of the muscles, widely dilated pupils, astonishing mobility of the eye-ball and eye-lashes, bloody frothing of the mouth and nose, epilepsy, and after death a peculiar greenish fluid in the stomach and exuding from the mouth.

Dr. S. J. Little, of Logan, O., recorded in the *Cincinnati Clinic*, 1875, 49, the case of three boys who ate of these roots.

Two who did not swallow the chewed material "suffered from a sore mouth for a few days." The third swallowed a piece as large as an almond and died in convulsions in a few hours. The pulse was 60, full and strong, the pupil dilated, perspiration great, body cold, but head hot. There was much vomiting.

Dr. W. H. Matchett, Greenville, O., reported in the Cincinnati *Lancet and Observer*, of 1870, 462, a very instructive case. A woman passing by a ditch which had been dug that day through a swamp, saw some roots projecting which resembled a bunch of sweet potatoes. She carried them home as a curiosity, and after exhibiting them to her friends, threw them into a wood-box behind the kitchen stove. The next day she was engaged in pickling Jerusalem artichokes, and two boys who were running about mistook the Cicuta roots in the wood-box for artichokes and ate them. In less than an hour they were seized with convulsions and one of them died in two hours. The other was saved by the prompt use of zinc sulphate and decoction of lobelia, but was insensible for three days. In this case there was no sweating, but a cold contracted, pale surface, dilated pupil, convulsions and some diarrhœa. The vomited matter consisted merely of water and foam. There was very great muscular weakness. Reference should here be made to the serious mistake made by this physician in administering Lobelia, which is in some ways a synergist to Cicuta.

The last case of this kind which came under my notice, was one which occurred last spring in the City Hospital at Newark, New Jersey. Two boys were found by the roadside in a state of partial collapse. They still held in their hands portions of the plant whose root had been eaten in mistake for parsnip. These were planted by the hospital physician, Dr. H. Grad, and after growing and flowering, were identified by Prof. B. D. Halsted and myself as those of Cicuta. A fatal result occurred in case of the boy who ate three pieces, while he who ate two pieces survived.

The active constituent of Cicuta has now been determined as coniine, the well-known active constituent of Conium.

Mention should be made at this point of the serious confusion which has resulted from the similar common names of several so-called "parsnips." Thus, the term Water parsnip has been applied to the Heracleum lanatum or Cow-parsnip which has thus become credited with powerfully poisonous properties, whereas in fact, it appears tobe an excellent aromatic-stimulant, but not at all poisonous. The common wild parsnip, Pastinaca sativa, has in a similar way come to be similarly regarded, but it is probably not at all poisonous, unless it may be through its local irritant properties.

One more subject will conclude our consideration of poisonous roots, that of a plant the dangerous properties or which have remained unrecognized, or, to say the least, very obscure, to the present time. I refer to the common black-elder or Sambucus Canadensis L., a plant very common throughout the entire eastern and central United States, and represented by other species, apparently with similar properties, upon the Pacific Coast and in the old world. Of the last mentioned, Dr. Robert Christison reports in the *Edinburg Medical and Surgical Journal*, 1830, page 73, as follows: "Two boys in the vicinity of Edinburg encountered a clump of the S. Ebulus, and one of them ate freely of the flowers, the other of the leaves. The boy who had eaten the leaves was attacked with enteritis, the abdomen at length becoming so sore that it could scarcely be touched. There was continuous vomiting, the matter containing blood. Obstinate constipation existed throughout. The boy was saved by vigorous treatment. The one who had eaten the flowers suffered considerably, and for a considerable time, from vertigo with some headache, but the symptoms were not very serious. Dr. Christison observed that both the berries and the flowers are known to kill fowls which feed upon them, and that when the berries are freely eaten they often cause giddiness. He also quotes a report of a case of a woman who dressed the shoots with vinegar and ate them as a salad, and who was promptly seized with violent purging, forty times in two days, coma resulting on the third day. Of our own species, S. Canadensis, Dr. Johnson states that the bark and the root are actively cathartic and hydragogue when freely used. There is little doubt that he refers in this instance to the bark and the root in the dried condition, and it is well-known that the properties become much less active upon drying and keeping.

Our most direct evidence bearing upon the poisonous character of the elderberry root rests upon a case which occurred in the spring of 1894, at the Institution of Mercy, a Roman Catholic institution for children at Tarrytown, on the Hudson, and which attracted a great deal of attention at the time in the public press. The grounds of this institution were comparatively new, and ditching and fencing were still in progress at the time stated. A workman in digging a drain, uncovered a large number of roots to which the children took a fancy and which they began eating. Within a very few minutes, and while still engaged in eating, a large number of the boys were seized with convulsions and several of them died. One of them had the remainder of the root, the marks of his teeth upon it, still clutched in his hand after death. The symptoms corresponded in most features to those of the Cicuta poisoning above described, and to that agent the accident was ascribed in the public press. Several months later I visited the institution in company with Mr. Frederick V. Coville, the botanist of the United States Department of Agriculture and Prof. Edward L. Greene, Professor of Botany, in the Catholic University at Washington. At this time, and subsequently through correspondence, a pretty thorough investigation of the case was made. We found that it was not a locality where Cicuta would be apt to grow and no evidence existed that any had grown there. Three poisonous plants grew upon the spot, viz., the locust, poke-berry and elder. The workman who had dug the drain, the surviving boys and the Sisters in attendance were positive that it was the elder root which had occasioned the poisoning. They did not know the name of the plant, and had accepted the statements of the papers that it was Cicuta; but they positively identified it by its appearance and by the young purple shoots and compound leaves which they had observed carefully while still attached to the pieces of root which had been taken from the hands of the boys poisoned. Their story was so clear, connected and positive that it was difficult to doubt that the elder root was the poisoning agent. Furthermore the locust would not have produced the symptoms that were observed; and the poke should have at once been distinguished by even a casual observer. Nevertheless, since the root was described as "like a carrot or parsnip," and since the symptoms in some respects resembled those of Pokeroot poisoning, the question cannot be regarded as settled beyond a doubt. In the case of so large a number of victims it is even possible that both of the roots were concerned. The attending physician, Dr. Luke Fleming, does not believe that the poisoning was caused by Elder. The active constituent of the elder is not known farther than that a report has recently appeared that an Italian chemist has isolated Coniine from the twigs and leaves of the related European species, S. nigra. This would, of course, explain the very similar symptoms to those of Cicuta poisoning. The chemistry of the plant is now receiving thorough investigation in the division of pharmacology in the United States Department of Agriculture.

Of known poisonous barks of this vicinity our list is a small one. The same suspicions already recorded may be applied to the bark of Ailanthus. As I shall show farther along that the leaves of Kalmia, Pieris, Ledum palustre, and the seeds of a horse chestnut are poisonous, the barks of the same must be regarded with suspicion. Prunus serotina and P. Virginiana are well known as yielding medicinal barks. Although these barks may be taken in large quantity there is doubtless a limit beyond which they would not be safe, and we must place them among those which must be used with caution. Both the leaves and seeds of Taxus are known to be poisonous and its bark also should be regarded with suspicion.

Although I have spoken of the root of Sambucus as being the poisonous part, it is to be borne in mind that it is the bark portion of the root which is active. The bark of the stem acts similarly, though in a less degree, so it is to be classed as one of the two positively poisonous barks which I shall designate.

The other is the Robinia Pseudacacia or common Locust. Of this Dr. Johnson records that by eating the roots children are poisoned with symptoms like those of Belladonna poisoning, and that the bark and leaves are emetic. Prof. F. W. Power has experimented upon himself with the stem bark of this tree, proving the very serious effects which it produces, and he has examined its composition with the result of showing that the poisonous constituent is an albuminous substance, thus confirming the general character of that family, the Leguminosæ. The most positive and prominent case recorded in regard to this article is that of Dr. Z. P. Emery. In the latter part of March, 1887, thirty-two boys, inmates of the Brooklyn Orphan Asylum, were poisoned at one time by eating a bark which was being stripped in the vicinity for the making of fence posts. None of the cases terminated fatally. The prominent symptoms, stated in the order of their occurrence, were the vomiting of a ropy mucus, flushing of the face, dilated pupil, dryness of the throat, feeble pulse, extremities cool, face pale, vomiting of blood, cold extremities, heart feeble and intermitting, face deathly pale and stupor. The symptoms as I have named them are seen to be progressive. A rash similar to that of Belladonna poisoning was also present, but very fleeting. In the beginning there was a high fever. Treatment consisted of sinapisms over the stomach, subcarbonate of bismuth, camphor and brandy.

This tree is so well known as a timber tree of the eastern United States that no description of it appears necessary. It is not however to be mistaken for the Honey-locust or Gleditschia, or for the Kentucky Coffee-tree or Gymnocladus. We have however another species, though somewhat less common, the R. viscosa Vent., which doubtless possesses similar properties.

Under herbage, in which term I shall include leaves, we find a large number of suspicious and positively poisonous species. Except when ignorantly or carelessly taken in overdoses for medicinal purposes, which subject it is not my purpose to discuss this evening, poisoning by leaves and other herbage is almost always referrible to the lower animals in grazing or to the ignorant, careless or mistaken use of poisonous plants as salads or greens.

The same poisonous character already ascribed to roots or barks or both apply to the leaves also, though not always in equal degree, in case of the following. Aconite, Locust, Cicuta, Sambucus, Veratrum, Lily-of-the-Valley and Wild Cherry.

Of Cicuta it is to be remarked that we possess a second species, to be regarded with great suspicion, the C. bulbifera L, so-called because of its bearing little bulblets in the leaf axils.

Of Wild Cherry leaves, in which term I shall here include also Choke-Cherry leaves, one of our most curious and important facts is to be recorded. It is known to all farmers that cattle and horses may browse upon the herbage of Wild Cherry among other shrubs, when the pasture is low without injurious results, if the plants be still growing and the leaves fresh and crisp; but numerous fatal results have been observed from eating the same leaves after the tree had been felled or the branches broken off and the leaves allowed to wilt. It has been suggested that this may result from obstruction by the mass of tough, wilted herbage; but the poisonous symptoms are not the slow ones of mechanical obstruction, but the swift ones of prussic acid poising. A case fully illustrating these facts came to trial in this State a few months since. A number of cattle were found dead in a field in the vicinity of some wild cherry trees which a neighbor had cut and allowed to fall across the fence and into this pasture, where they became wilted before the cattle had an opportunity of reaching them. The defense was that the cattle had been struck by lightning, but no evidence of this could be adduced and judgment was rendered for the plaintiff.

The poisonous effects of the herbage of Veratrum are well illustrated by the following: A family in New England had heard of the Caltha palustris as furnishing a wholesome green in early spring and not knowing the plant, had taken a description of it and gone into a swamp where it was supposed to grow, to collect it. All partook freely of the article, which subsequently proved to be Veratrum, and all were violently poisoned, though none of them died. Fortunately poisoning by this well-known plant is rarely fatal, though the suffering is severe and continues for some days. Safety is afforded because of the slow absorption of the poison and the free emesis, which generally comes on early. Indeed, persistent and uncontrollable vomiting is the chief symptom and is accompanied by depression of all the vital powers, cerebral anæmia being the prime result. In the above case emesis was tardy in developing and had to be assisted.

Poisonous herbs of a minor character, that is those not recorded as having produced serious results but of a suspicious nature, are Menyanthes, the violets, Ailanthus, Lobelia syphilitica, L., and L. cardinalis, L., Linaria vulgaris Mill., Chenopodium ambrosioides L., the two Laurels, Pieris and Solanum nigrum L. and S. Dulcamara L.

Ailanthus leaves are placed in this class because of the history which has already been given in connection with the roots.

The Lobelias named are suspected because of the very poisonous nature of their relationship, of which I shall speak farther on in connection with the L. inflata.

Linaria vulgaris is known to be fatal to various insects, and the volatile principle which escapes from it while wilting in the sun is capable of causing emesis in some persons who merely inhale the tainted atmosphere. It also possesses poisonous relatives.

Many violets are noted for their ipecac like properties, yielding a glucoside called violin and long confused with the emetine yielded by ipecac. They may be classed among the emetico-cathartics, and a large quantity might easily be productive of serious results to a child.

The same statement may be applied to the Menyanthes or Bog-bean.

While the plant of Chenopodium ambrosioides has not been known to produce fatal poisoning, yet such cases have to be recorded as resulting from the oil which is yielded by the seeds. The plant therefore must be held under suspicion.

Reference has already been made to the poisonous effects of certain potato tubers, and we shall hereafter have to charge similar properties to the fruit. These facts led to the examination of the herbage of the common potato for the presence of narcotic principles, and extravagant claims were at one time made concerning its medicinal properties. Careful scientific and exhaustive experiments were made with it by Dr. H. C. Worsham of Philadelphia, with the result of proving that it was inert. (See *Philadelphia Medical Journal*, VI, 22.)

Not so however of the herbage of the S. nigrum, one of the most, if not the most, widely distributed of plants, as well as one of the most variable. It is not common hereabout, but may be found occasionally in rich ground in waste places. Lindley states that a grain or two of the dried leaf will excite a rather dangerous agitation in the viscera, and at least one case of irritant narcotic poisoning is recorded. Nothwithstanding these facts however, the leaves are said to be consumed on a large scale in certain parts of Europe, thorough cooking appearing to destroy the poisonous properties. However, I would repeat this statement with a caution, as it appears at least possible that there is here a confusion between different plants.

Kalmia latifolia L. represents a group comprising also the K. angustifolia L. the Pieris, at least P. Mariana (L.) B. and H., and the Rhododendron maximum L., the leaves of all of which must be treated with caution. As to the Rhododendron we have only country legends in evidence that it is poisonous. Its nearest locality to this city is the Delaware Water Gap, but in many parts of the Alleghenies and Blue Ridge it occupies the swamp lands almost to the exclusion of all other shrubs. Both of the laurels are rather scurce in this immediate vicinity, but become abundant, especially the K. latifolia, as soon as we depart a few miles from the city in almost any direction. The smaller one bears the suggestive title of "Lamb-kill," and farmers are positive in their assertion that it is a narcotic poison to their animals. Its properties have never been investigated.

As to the larger laurel, much contention has existed as to whether it really is poisonous. Among countrymen and hunters it is generally believed that partridges die after eating its young shoots or "buds." Johnson quotes these views, but at the same time takes occasion to express a doubt as to their correctness. However, a writer in the *Boston Medical and Surgical Journal*, 1834, 214, seems to me to have established the facts beyond cavil. He reports careful and continued experiments on himself, two ounces of the leaves infused in a pint of water having been taken within two or three hours in successive doses. He observed a prickling sensation, especially in the head, sleepiness, gastric heat, dizziness, great fatigue, especially in the muscles of mastication, contraction of the stomach, gradually forcing out the contents through the œsophagus, vomiting without nausea, but paroxysmal and repeated, impaired vision amounting to blindness, increased on taking the erect position, cool perspiration, salivation, and no catharsis. The symptoms were relieved by alcoholic stimulants. The pulse was slow, weak and frequent, forty to the minute. The writer also referred to similar symptoms in others who had experimented with it. He commented upon the similarity of these symptoms to those of veratum poisoning, but pointed out that they were slower in their onset, more narcotic and less emetic, the muscular weakness quicker and greater and no muscular cramp as caused by veratum. As the results were slower in developing so they were slower in disappearing, than in the case of veratum. An examination of the leaves has demonstrated the presence of andromedatoxin, a poisonous glucoside very generally distributed in the evergreen leaves of the Ericaceæ.

Concerning Pieris Mariana, also we have only country legends to guide us. It is also known as Lamb-kill, but more commonly as Stagger-bush, which suggests the narcotic nature of the poisoning which it is said to occasion. Its activity is doubtless due to the presence in it of andromedatoxin.

In this connection note may be taken of the fact that of two species of Ledum, a closely related genus, one, the L. Grœnlandicum Oeder, is freely used as a beverage, substituting tea, and known as Labrador tea, while the other, L. palustre L., is strongly poisonous through the andromedatoxin which it contains.

Reference has been made to the vesical irritation caused by over-eating of horse-radish. Precisely the same can occur from over-eating of the ordinary water-cress. A case has come under my own observation in which a man ate to excess of them after a long fast, and taking no other food in connection with them, thus hastened absorption and excretion. The most intense suffering and anxiety resulted.

Somewhat similar in kind are the symptoms caused by the junipers. The agonizing and deadly effects of overdosing with oil of savin are well known. Other species of Coniferous plants share these properties in variable degree, although there is no reason to expect that they will be eaten.

The same thing is true of various species of buttercup and other plants of the Ranunculaceæ. Johnson says their internal use is not either desirable or safe. The distillate of Ranunculus Flamula is powerfully emetic and the roots of R. Thora are very poisonous. Various cases of poisoning of domestic animals by these plants are recorded. Even applied to the external skin, they act severely as blistering agents. A species of Clematis is used by the Cubans to blister the face for toothache, and this and other species are similarly used for rheumatism. It is said that beggars have used the juice of Ranunculus Sceleratus L. to make pitiful sores upon their bodies. The sores so caused, are said to produce little pain, but are very obstinate in resisting a cure and have a great tendency to slough. Because of the painlessness and because there is no danger of poisoning by absorption as in the case of Cantharides, it has been proposed to substitute the fresh juice of these plants for the latter in scientific treatment. But the uncontrollable nature of the ulcer is considered a bar to such practice. Poisoning accidents from eating these plants may be regarded as improbable, owing to the painfully acrid effects upon the mouth.

The same acrid taste militates against

poisoning by Chalidonium or Garden Celandine, which is a violently acrid narcotic and drastic poison, the cerebral disorder being very great. It is very similar in composition and properties to Sanguinaria, and all that has been said of that rhizome as a poisoning agent may be applied to Chalidonium. Various fatal poisoning cases are recorded in the foreign journals, through overdosing. It is even powerfully irritant to the external skin.

Tanacetum vulgare L. or Tansy has become very extensively spontaneous along roadsides and in waste places. It grows in extensive patches, often in grassy places, but soon kills out the grass and all other plants and occupies the ground exclusively. It is easily recognized from the illustration, and by its odor. The taste is bitter and disagreeable and none are likely to eat it. But the practice prevails of making a rude tincture in spirits and otherwise using it as a domestic remedy, in which way poisoning accidents may occur. Most frequently, however, they result from the use of the oil as an abortifacient. The symptoms are very largely abdominal as well as cerebral, and are extremely painful.

Absinthium is in a general way similar in composition and properties as a poison, though the symptoms are more largely cerebral. Neither is it liable to be taken except for medicinal purposes or as an addition to spirits. As a result of the latter, poisoning is usually chronic and extremely difficult to cure. The plant is very rare in this vicinity, occuring only in isolated small patches. In all my local collecting I have never encountered it.

Several cases of fatal poisoning are recorded from eating the stems of the Cicuta. It is very probable that the plant may occasionally be mistaken for one of the Angelicas, the stems of which are so highly esteemed that they are frequently "candied" in the fresh state by confectioners.

In this connection reference may be made to the conium plant, the composition and properties of which are practically identical with those of Cicuta. Conium is very scarce in this section, a few isolated plants occasionally occurring in waste places. Neither is the plant at all likely to be eaten.

This brings us to the consideration of a group of deadly narcotic herbs, consisting of Tobacco, Hemp, the two Daturas, Henbane and Belladonna.

Tobacco, Nicotiana Tabacum L., may be dismissed with a mere mention, as its properties are so generally known. It is very scarce hereabout, only occasional plants being seen.

The same may be said of Hemp, Cannabis sativa L., the flowering tops of the female plants of which yield an extract well-known under the name of Hashish. There is no likelihood of the plant being eaten in poisonous quantity.

Henbane (Hyoscyamus niger), Belladonna (Atropa Belladonna) and the Daturas (D. Stramonium and D. Tatula) with composition and properties almost identical, may be considered together. The first two are found in this section only occasionally, as isolated plants, but not so the Daturas. Both are very common and very abundant in all waste places in and about the city. They are very easily recognized as rank-smelling, stout, tall, widely branching annuals, in general habit resembling poke-weed, but with large, inequilateral, very coarsely toothed or lobed leaves, campanulate, fragrant flowers 4 to 6 inches in length, and half, or more, as broad, and large sub-globular capsular fruits 2 or 3 inches in diameter, armed with soft fleshy spines and containing numerous small, blackish, reniform, reticulate seeds. The D. Tatula is distinguished by its more strongly purple stems, purplish flowers, usually smaller size and nearly equal prickles of the capsules. The distinction is, however, not essential, as the properties are regarded as identical. The whole plant has a striking, and to the careless an attractive aspect, and few plants in the world have so extensive a toxicological literature. Although poisoning is most common by the seeds, under which the subject will be considered, we must remember that the herbage is not without its record in this direction.

We close our account of the poisonous herbs with that of the Lobelia inflata L. or Indian Tobacco, a plant exceedingly common in our vicinity and with an extensive record of fatal poisoning cases, all of which have occurred through its improper use as a medicine. This has always been a favorite remedy with the quack medical sects such as the Coffinites. A writer in the *British Medical Journal* for 1882 says, "Deaths from Lobelia inflata administered by Coffinites are of frequent occurrence. Their dictum is that 'heat is life and the want of heat disease and death.' In accordance with this principle, their drugs are Lobelia and Cayenne. It is asserted by them that Lobelia cannot kill, but it has been shown over and over again that, when not rejected, it acts as a powerful toxic agent and kills with the greatest certainty. The treatment of poisoning by Lobelia is simple. The stomach pump should be used if necessary, stimulants should be freely administered and a dose of $\frac{1}{25}$ of a grain of nitrate of strychnine, or its equivalent in Nux vomica, should be injected hypodermically." In the case referred to by this writer, perforation of the stomach was found after death. Another writer in the same journal, 1860, 11, 799, reports the case of a child poisoned by this plant which suffered such agony as to lead it to lacerate its face and limbs with its nails. The drug is therefore to be regarded as an irritant narcotic poison. Identification is easy. It grows in partly grassy open locations, especially those which are gravelly or partly sandy. It is about a foot high, branched, often much so, with little blue flowers solitary and sessile in the axils, the corolla split down the front, and especially by its inflated capsules.

Concerning poisonous flowers there is very little to be said. Poisoning accidents by them are rare indeed, yet it is proper to record a few which have been found to be poisonous, and must hence be regarded as more or less dangerous.

A case of slight narcotic poisoning by Elder flowers has already been cited.

The flowers of Lily-of-the-Valley share in a lesser degree the properties of the remainder of the plant, and because of their fragrance, attractive appearance and sweetish tastes are especially dangerous to children.

The flowers of the locust are regarded with suspicion, and it is claimed that the occasional poisonous properties of honey are due to its origin in these flowers, though there are good theoretical reasons for doubting this.

The same statement applies to nectar obtained from flowers of the two species of laurel and of Pieris Mariana, or Stagger-bush. It is interesting to consider the possible intoxication of the insects by this property with a resulting increase in the spread of pollen due to the clumsy movements so induced.

Coming now to the consideration of poisonous fruits, we observe that the liability to accidents from eating them is far greater than in the case of any other part of the plant. It is therefore proper that we should give relatively close attention to such articles. For convenience of treatment, fruits and seeds will be in part considered together.

It is first to be recorded that one unripe fruit (berry), of the common potato has killed a girl of 14 years, on the third day, with the ordinary symptoms of narcosis pertaining to this group.

Of the Solanum dulcamara or Bittersweet, Lindley says, "Its gay, tempting berries have occasionally caused serious accidents among children and others who have eaten them." Care is to be taken to distinguish this, the true Bitter-sweet, from that so-called in New England and elsewhere, the Celastrus scandens or False Climbing Bitter-sweet. The latter has fruits which burst open in the fall, and are used for decoration. The fruits of the former are oblong, soft, translucent and fleshy. The plant does not truly twine, but reclines on bushes along streams and in damp places, and is very common hereabouts.

A very similar appearing fruit is that of the Taxus minor (Mx.), Britton, or Creeping Yew. It is not common close by the city, but I have found it in northern Jersey and it is common in the Catskills. The fruit is of similar form and color to that of the Bitter-sweet, but is solitary, erect, shorter and broader, has a circular opening at the apex and a solitary large seed. Johnson casts doubt upon their poisonous properties, though he says that those of the European plant have produced fatal effects, hence ours are to be regarded with suspicion. Lindley says the berries are not harmful, except the seeds, which, like the leaves, produce symptoms like Digitalis.

It appears that the alkaloid of the seeds is not identical with that found in the leaves. A child poisoned by the seeds was semi-comatose, with occasional convulsions, had a cold and clammy skin, dilated pupil, difficult respiration and made fruitless attempts to vomit. It thus appears that the symptoms are not well understood. Neither is the treatment.

A somewhat similar fruit is that of the Actæa rubra, Red Baneberry or Red Cohosh. The white berries probably have the same properties. I have found no record of the properties of the American form, but Lindley says that the European produce death with violent delirium and emetico-catharsis. There is not the slightest reason to doubt that the American would act similarly.

Of Conium it has already been stated that it is scarce within our range. Nevertheless its extremely poisonous properties render attention to it important. Danger resides especially in the fact that the plant resembles in a general way those of Anise, Fennel, Caraway, Coriander and other edible Umbelliferæ. The seed-like fruits also very closely resemble those of Anise, and in a less degree those of the others named, for which they might easily be mistaken by the ignorant, inexperienced or careless. Symptoms and treatment have been given under Cicuta. The fruits of Cicuta may be referred to in the same terms.

Our consideration of poisonous fruits will close with the recital of two cases almost as inexplicable as they are unusual, namely poisoning by the fruits of Wild Cherry and May-Apple.

Dr. Geo. K. Pardee, of Wadsworth, Ohio, reported in the *Western Lancet*, VI, 1847, 289, the case of a boy who was accustomed to visit a tree loaded with wild cherries each morning, and to eat freely of the fruit. Not the slightest inconvenience was experienced until after many days, when he was suddenly seized with cramps, convulsions, and opisthotonos, with speedy death resulting. After death the stomach and intestines were found stuffed with cherries and cherry stones, many of the latter having apparently been there for a long time. The case is obscure, the symptoms not having been carefully observed nor well reported. The indications are those of mechanical injury, yet the suddenness and speedy nature of the result would indicate that digestion and fermentation had reached the seeds contained in the stones and hydrocyanic acid had suddenly been produced in sufficient quantity to prove fatal, the symptons being complicated by those of mechanical irritation.

Of poisoning by the fruit of Podophyllum peltatum, Mandrake or May-apple, I find two cases. One of these, on account of the indefiniteness of the evidence, and in view of the well-known edible nature of this fruit, might be considered as uncertain; but the evidence in the other case leaves nothing to be desired.

Dr. Walter B. Reynolds of Washington, D. C., Coroner, reports the case of a woman who, during the middle of June, "purchased two May-apples, weighing 16 grams," to be used as a physic. The result was severe emetico-catharsis, with collapse, but subsequent recovery. The case was complicated by her having also taken a dose of three quack pills, probably containing mandrake rhizome or resin. It is possible that this started or aided the action of the fruit, if it was ever actually eaten as reported.

Dr. D. C. Owen, of Houston, Ill., reported in the *Chicago Medical Examiner* for 1863, p. 389, the case of two little girls who ate freely of this fruit, without any other cause to induce the poisonous results which followed. The symptoms were wholly those of persistent and uncontrollable emesis, there being no catharsis. The pulp and the seeds of the fruit were freely vomited. One was so far gone when seen that recovery was impossible and she died. The other recovered under treatment by opium and external heat. The one who recovered stated that the rinds of the fruit were ruptured by the teeth and the contents sucked out. Commenting upon this case, I would remark that it will be very difficult for those who are familiar with the extensive eating of this fruit in the regions where it grows, to credit the occurrence of fatal poisoning cases. But it is to be remembered that the susceptibility of different persons to the effects of the class of poisons to which mandrake belongs, acting wholly through their local irritation, is variable in the extreme. It has already been shown that some persons cannot bear the contact of the powdered rhizome to the external skin without the production of ulcers. Is it not entirely credible that the sensitive lining of the stomach of such persons might be seriously affected even by the small amount of active principle that we suppose to exist in the fruit?

The properties of a few more seeds remain to be considered, first those of the castor-oil plant, which is common in gardens, and occasional in waste places. The pretty, shining seeds, and their rather pleasant taste render them objects of attention by children. Although castor oil is expressed from these seeds, and although that oil may be taken in large quantities without danger, this is not true of the seeds themselves. There remains in the pulp, after the expression of the oil, a small quantity of an exceedingly poisonous substance, ricinin, so that a few seeds eaten entire might cause serious symptoms in a young child.

The same may be said of a number of other seeds of the Euphorbiaceæ. Euphorbia Lathyrus L. is occasionally found wild in this section, and two fatal cases of poisoning by its seeds are recorded. The seeds of other species have been known to produce the same result.

Suspicion must be attached to the seed of the common Horse-chestnut, notwithstanding that no serious cases of poisoning have been attributed to it, because of its relationship. Of the seeds of the one here shown, the red Buckeye (Aesculus Pavia L.). Johnson says the active principle has been shown to be a glucoside possessed of poisonous properties. It is narcotic and about ⅓ as strong as opium. In the Southern States the seeds are crushed and thrown into the water to stupefy fish, just as the bark and roots of its relatives are used in the tropics. Fatal cases of poisoning of children by these seeds are reported from Texas.

A very poisonous substance is the oil obtained from the seeds of Chenopodium anthelminticum, or American worm-seed. All the recorded cases of poisoning by it have occurred through the improper medicinal use of the oil, and indeed the nauseous odor and taste of the seeds would seem to almost preclude the possibility of its being taken in any other case.

Dr. W. C. Paramore, Coroner, of Chicago, reported November 8, 1875, the case of three children of 6, 3 and 1 year of age, who took respectively doses of 8, 6 and 4 drops, 3 doses each on Tuesday Wednesday, one on Thursday morning. After the first dose they became very sleepy and thirsty and later developed great pain followed by gradual coma and death. They vomited at first green, afterward black matter.

Prof. Thos. R. Brown, M. D., of the College of Physicians and Surgeons of Baltimore, reported the case of a man poisoned by an amount not known. The symptoms were vertigo, intolerance of light, hypersensitiveness to sounds and aphasia of both kinds. After many days he died of apoplexy. One of the most prominent symptoms is intense sensitiveness to sounds, but deafness as to distinguishing them. Dr. J. Stoddard reports saving two of three boys by evacuating the stomach by vomiting (and this is the most important and promptly reqnired element of treatment) castor oil, enemas, brandy and external heat.

Finally I consider poisoning by Datura seeds, that by Henbane seeds being similar. It may be difficult for the well-to-do to understand how any one can be led to eat these seeds. But let us think of the thousands of children who are not only tempted by the sight of the numerous fruits exhibited upon the stalls of the city, of which they can rarely partake, but who are even in want much of the time of what is necessary to satisfy the actual demands of hunger. It is not strange that such should be led to experiment with so attractive looking a fruit as the thorn-apple. It is significant in this connection that most of the cases of poisoning have occurred in India, and many of them in time of famine. The symptoms and treatment are the well-known ones of irritant narcotic poisoning.

It should not be over-looked that both black and white mustard, especially the former, may produce poisonous effects in large over-doses, the nature of the poisoning being irritant and similar to that by horse-radish and water-cress as previously described, with however more disturbance of the stomach.

In conclusion I would present the appended table which is believed to include in a classified form, all the articles to which this contribution was limited in the beginning.

I should have been very glad to have considered the subject of poisonous fungi, but this will be taken up by my colleague, Prof. Jelliffe, at an early date.

Reference should also have been made in passing to those poisonous products of disease germs, minute vegetable organisms which cause so many fatal epidemics.

A separate chapter should also be given to those plants which occasion cutaneous eruptions, like poison ivy and the nettles. But for all these time will not suffice, and they must be deferred until some other occasion.

TABLE EXHIBITING THE POISONOUS PLANTS OF THE VICINITY OF NEW YORK CITY:

	ROOTS, ETC.	BARKS.	HERBAGE & LEAVES.		FLOWERS.	FRUITS & SEEDS
Known powerful poisons liable to occasion accidents.	Phytolacca Robinia Cicuta Sambucus Solanum tub. (some tubers) Veratrum Convallaria	Robinia Sambucus	Cicuta Tanacetum Datura Veratrum Aconitum Nicotiana		Convallaria	The Actæas Cicuta Conium Solanum tub. " dul. Datura Taxus Ricinus
Known powerful poisons not liable to occasion accidents.	Aconitum Podophyllum Sanguinaria Chelidonium Iris Leptandra Arisæma		Ranuculus Clematis Prunus Lobelia inf. Absiuthium Convallaria Hyoscyamus Atropa Solanum nig.	Sambucus Conium Cannabis Juniperus, etc. Taxus Chelidonium		Aesculus Pavia Chenopodium amb. Euphorbia Hyoscyamus Atropa
Known to be poisonous in minor degree.	Cimicifuga Actæa Nasturtium Arm. Viola Gillenia Triosteum Ipomœa paud. Apocynum Euphorbia Ip. Trillium Asclepias		Nasturtium pal Viola Menyanthes Kalmia Pieris		Sambucus Kalmia Pieris	Sambucus Sinapis Juniperus
Suspicious.	Ailanthus Kalmia Pieris Ledum Rhododendron Lachnanthes Tephrosia	Ailanthus Kalmia Ledum Pieris Rhododendron Prunus Taxus	Ailanthus Lobelia card. " syph. Linaria Robinia Chenopodium Phytolacca Rhododendron		Robinia	Podophyllum Ailanthus Aesculus Hip. Prunus

J. NIVEN HEGEMAN DEAD.

Johnson Niven Hegeman, Secretary of the New York College of Pharmacy, died at his country seat at Irvington, N. Y., on November 12th of apoplexy. On the Thursday previous he had been to business as usual, and was returning home on the train when he was seized with the attack, from which he never rallied, notwithstanding the efforts of his physicians, Drs. J. P. Munn and Coutant. Mr. Hegeman was 56 years old and was a descendent of one of New York's oldest families, his ancestors on his father's side being among the original Dutch settlers of New Amsterdam, while on his mother's side he was a great grandson of Col. Niven of revolutionary fame. Through the marriage of his youngest sister he became a brother-in law of Mr. Chauncey Depew. After the completion of his education at the Charlier Institute in this city he began his business career with his father, William Hegeman, who at one time controlled as many as six stores in this city and was known throughout the country for the reputation of his original preparations, particularly Hegeman's Camphor Ice. After the death of his father, the firm became J. N. Hegeman & Co. with Mr. Hegeman as senior partner, the other members subsequently being John W. Ferrier ('76) and J. Boyd Henny. Mr. Hegeman always took an active interest in pharmaceutical affairs both from a professional and commercial standpoint. His stores at Broadway and 9th, Broadway and 30th sts., 450 Third ave. and Fifth ave. and 59th st. being rendezvous of the city's leading physicians.

He continuously served the New York College of Pharmacy as secretary for ten years and as a trustee had been an invaluable aid to this institution. In his death the students lost a staunch friend, for it had always been his custom to have postions reserved for them in his stores, and such men as Ferrier, '74, Buck, '91, Ferris, Doak and Borggreve, '92, Taylor and Baldman, '93, Auerbach, Clark and Kirk, '94, and Lavalye, '95, owe much of their success to his generosity.

A wife, two daughters and a son survive him. His funeral, which took place at Christ's Church, this city, was largely attended by relatives and friends, the interment being in the Trinity Cemetery.

A NEW JOURNAL OF HYGIENE AND MEDICINE.

Pediatrics is the title of a new medical journal devoted to the diseases of children, published semi-monthly by the Van Publishing Co., New York, and John Bale & Sons, London. The owner is Dillon Brown, the well known specialist in children's diseases, and the editor Geo. A. Carpenter, who occupies a similar position among the British lights. The corps of associate editors is extensive, as follows : Medicine, A. Jacobi, of New York and F. Forchheimer, of Cincinnati ; Surgery, H. R. Wharton, of Philadelphia, and S. F. Eve, of London ; Orthopedics, H. L. Taylor, of New York, and F. R. Fisher, of London ; Gastro-enteric Diseases, M. Manges, of New York, and J. Boos, of Berlin ; Therapeutics, D. Williams, of London ; Materia Medica, H. H. Rusby, of New York ; Teratology, E. H. Grandin, of New York ; Laryngology, W. C. Glasgow, of St. Louis, and M. Howell, of London ; Dermatology, J. W. Hyde, of Chicago, and L. Phillips, of Birmingham ; Ophthalmology, M. Standish of Boston, and W. A. Brailey, of London ; Neurology, J. Collins, of New York, and W. R. Gowers, of London. The first number, dated January 1, 1896, of 48 pages, is at hand and contains a "Review of Infant Feeding," by Dr. Jacobi ; "A Cretin" (illustrated), by Drs. Frintinght and Brown ; "Enterocystitis in a Congenital Sub-gluteal Hernia" (illustrated), by Dr. Lilenthal, "The Japanese Ice-berg," by Dr. Phelps, "Fibroid Phthisis," by Dr. Sutherland, and a large number of notes, items, reviews, reports and abstracts. The latter indicate, as one should expect from the make-up of the editorial staff, that the Journal is to be wide awake in following up all innovations in medicoments and in treatment. The steadily growing intimacy between medicine and pharmacy no longer permits that any representative member of either may ignore the literature of the other and "*Pediatrics*" will doubtless find its way into the files of many pharmacists. The subscription price is two dollars, or eight shillings a year.

THE Alumni Journal

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B. FRANK HAYS, 17 Vandewater St., New York

All communications relating to finances and subscriptions and business matter in general should be addressed to

A. HENNING, Treas., 115-119 West 68th Street.

WITH this issue the second volume of THE ALUMNI JOURNAL closes. In looking through the pages of the last volume it is gratifying to see the new interest awakened in the affairs of the Alumni Association and the College. That the JOURNAL has been a potent factor in bringing this to pass does not admit of a doubt. It has revived and kept alive old associations among members, aroused enthusiasm and been a means of drawing the members together upon a broader and more comprehensive footing. The interest awakened by the Alumni lectures has been the means of bringing together many members of the Association and College who are, comparatively speaking, strangers to its walls. The last lecture in particular, by Prof. Rusby, was delivered to an audience which taxed the seating capacity of the lecture hall to its utmost.

The Association is to be congratulated upon the success thus far of its lecture course, and the remainder of the lectures scheduled will no doubt prove as interesting and as attractive as those which have been thus far delivered. It is also gratifying to be able to chronicle the growth of the subscription list of the JOURNAL, and to feel that the critical part of its career has passed and that its success is firmly established. During the past year its original articles have been quoted, and in several cases reprinted in full in other journals. It is particularly gratifying to the present editor, who assumed control of the paper when interest in its welfare was at an ebb, and who now feeling that the JOURNAL has no longer any need of his services, an whose duties have so largely increased as to prevent him giving the time which the JOURNAL demands, reluctantly resigns his position, trusting that some one better fitted than he, and with more time at his disposal, will carry the good work forward and place the JOURNAL on a higher plane than it has yet reached.

BOOK REVIEWS.

Laboratory Manual of Inorganic Preparations; by H. J. Vultè, Ph. D., and Geo. M. I Neustadt. Pub. by G. Peck, 11 Murray street, New York City. $2.00.

This manual which is devoted to the synthetic preparation of the more difficult inorganic compounds, and C. P. reagents, will certainly be welcomed by the various laboratories devoted to inorganic work. Outside of a few elementary works on chemistry, little is to be found bearing directly on this subject in the English language, and those that are given, are so simple as not to be of any practical value to the student.

In criticism of the book, it might be said that some of the descriptions are rather laconic and more illustrations might have been included, however it seems to have been the endeavor of the authors to keep the book from becoming too bulky, as this is an item not to be overlooked. This book cannot certainly be too highly recommended for the use of pharmaceutical students and progressive pharmacists. C.

When the final events of the Graduating Class of '95 terminated after a customary fashion behind the foot lights of Carnegie Hall upon the ninth evening of last May, there was a general departure of the one hundred and five victorious students for "parts unknown," however, one of them is now an inhabitant at a rural spot among the Rocky Mountains, and from thence this article comes. My location, a particularly interesting one in the study of geology and in those studies of concern to all pharmacy students, viz., chemistry and botany, is a distance of eighty miles from Denver, Col., and twelve miles from the snowy summit of Pikes Peak. Here, metals of the First, Second, Third, Fourth and Fifth Groups abound in unlimited quantities, in fact, the whole material that goes to make up the earth's substance at this point seems to consist of characteristically distinct metals that may be detected and named with ease. Beginning with the members of the first group, lead. silver and mercury, it is well known that the financial welfare of this State depends largely upon the existence of the former two and immense mines of these metals are in operation throughout the "Rockies" from which I have recently seen "lead ore" that yielded 83.5 per cent. of pure metallic lead and "silver ore" where the valuable metal itself was deposited in a native state to the amount of 90 per cent of the weight of the ore

Belonging to the second group, copper, arsenic, antimony and gold are the most plentiful.

Antimony occurs in this locality as stibnite, in handsome prismatic crystals of the orthorhombic. These crystals are often acicular and arranged in radiating groups ; magnificent in size and brilliancy of luster.

Arsenic is found associated with sulphur, giving the fine red and orange colored "realgar," which is 70.1 per cent. arsenic.

Of the remaining three groups of metals, iron, manganese, calcium, magnesium, sodium and potassium are the most important in occurrence within this section of the Mountains : Iron especially is a metal of great abundance and the beautiful pieces of iron pyrites from various mines range in value, to the seekers of "curios," from one to twenty dollars. Calcium exists in numerous caves in the form of stalactites, which were thoroughly treated in the October issue of THE ALUMNI JOURNAL. Manganese is found principally as a carbonate while magnesium, sodium and potassium are most prominent to us as they occur in spring waters. Many mineral springs throughout this vicinity give waters holding in solution as high 1.36 grams of calcium bicarbonate and 0.85 grams of sodium bicarbonate to the liter, besides worthy quantities of K_2SO_4, Na_2SO_4, NaCl, $MgHCO_3$, SiH CO_3 and FeO—being also strongly charged with carbon dioxide.

A number of plants of very prolific growth in this region are deserving mention, but I will here refer to one only, the "Loco." It was this plant that caused such a rapid death rate among the stock of this section of the country a few years ago and for which the government, thinking that it might be exterminated, offered a liberal bounty, but of no avail, acres of it were soon under cultivation and farming in a soil of sand was a pronounced financial success.

JESSE I. BAILEY.

Foods preserved in Carbonic Acid.—An improved appparatus for preserving food is a tank filled with carbonic acid gas, which, being heavier than air, does not escape. The gas impregnates the foods stored on the shelves and preserves them indefinitely without injury, and also keeps them free from insect life. The gas is thrown off from the foods very soon after being exposed to the open air ; their natural freshness and flavor are retained much better than if they had been in contact with ice.—*Mineral Water Trade Recorder.*

Alumni Association.

MINUTES

OF THE MEETING HELD NOV. 13TH, 1895.

The meeting was preceded by a "Lecture" on "PoisonousPlants of theVicinity of New York City," delivered by our able and beloved Professor of Botany, Materia Medica and Pharmacognosy, Dr. Henry H. Rusby.

Whether it was the subject of the lecture or the personality of the Professor that attracted such a large audience, would perhaps be difficult to say, but the audience was certainly one to be proud of, there being also quite a number of ladies present. The lecture in itself was exceedingly interesting and instructive, besides the very attractive display of colored lantern slides which were shown to good advantage and were beautifully executed.

After the lecture the members of the Association adjourned to the "Alumni Room," where the meeting was called to order by President Stover at 10 P. M.

There were present the Misses K. C. Mahegin, '89, and Agnes P. Mahoney, '95, and Messrs. Alfred Stover, '83, Wm. H. Ebbitt, '79, A. Henning, '76, H. Graeser, '89, Chas. F. Keale, '89, L. Jacobson, '93, Julius Tannenbaum, '93, Harry Heller, '93, W. A. Hoburg, Jr., '93, Chas. S. Wolff, '94, Chas. Stoerzer, Jr., '94, N. S. Kirk, '94, Geo. F. Burger, '94, Henry Kruder, '94, H. A. Herold, '94, Geo. H. Jorgensen, '95, and Fred. L. Flick, '95.

The minutes of the last meeting were read and adopted. The report of the Committee on "Reception and Ball" was read by Mr. Tannenbaum, and proving very satisfactory, was adopted.

Regularly moved and seconded that a committee of three (3) be appointed to make all arrangements for the Reception and Ball; motion carried, but appointment reserved.

Motion made and seconded that the Ball be held on the evening of January 22, 1896, at the "Madison Square Banquet Hall;" carried.

The following letter was received from the Faculty of the College, dated November 9, 1895:

The Secretary of the Alumni Association:

Dear Sir—At a meeting of the Faculty of this College, held October 11th last, a resolution was passed:

That the Faculty of this College offer to its Alumni Association a sufficient number of Dr. Rusby's pamphlets on the History of the College to provide one for each member of the Association, provided that the Association pays the mailing expenses. The above resolution was passed in order that every member of the Association may obtain a copy of this pamphlet without expense to the Faculty who have assumed the expenses of its publication. Very truly yours,

ARTHUR H. ELLIOTT,
Sec'y to the Faculty.

It was moved and seconded that this very kind offer from the Faculty of the College be accepted with thanks, and that the Secretary notify them of such action. Carried.

A letter was received from Otto Hensel, '95, thanking the Alumni Association for electing him third Vice-President; the letter was dated from "Meyringen in the Alps," Europe.

The report of the "Piano Committee" was then read by Mr. Henning, and it was decided to buy one of the firm of Strich and Zeidler, to be paid for from the reserve fund, a motion having been made and carried, to that effect.

Rudolph Gies, Class '95, of 396 Third ave., being duly qualified, was elected a member of the Alumni Association, the Secretary casting one affirmative ballot, electing him to membership.

Motion made and carried that a committee be appointed to take suitable action on the death of J. Niven Hegeman, the Secretary of the College. The President appointed Messrs. Kirk, Tannenbaum and Hoburg.

There being no further business before the meeting, a motion to adjourn was made and carried.

Respectfully submitted,
WM. A. HOBURG, JR., Sec'y.

'95 NOTES.

IT is most gratifying to notice the large attendance at the lectures and meetings of the Alumni Association.

AT the last lecture by Prof. H. H. Rusby, there was standing room only, and the alumni room was taxed to its utmost capacity by the influx of the members.

IT is very gratifying to see the enthusiasm of the boys awakened; it is gratifying to see them getting in line and asking for work to do to further the interest of the alumni and their Alma Mater.

THE meeting of the alumni held after the lecture was very important.

FOR a long time the boys have been complaining about the slowness of the alumni, and bewailed the absence of a social side to the Association. That is true. What is to be done? How is this to be remedied? Instead of staying away from the meetings, come, join us, come forward if you have anything to say, say it. That's just what a few enthusiasts have done, and with the help of our respected president, we began to institute reforms. Yes, boys, we will have a reception this winter, sometime in January. We will have a piano of our own, we may have an occasional stag, a ladies' night, a hop, a dance or a song, in fact, make a meeting night a most enjoyable evening.

NOW, then, boys, the time to show what stuff '93 is made of, has come.

COME all ye that are not members of the Association, and we will make members of you.

COME all ye that are members, come and be jolly with us.

PETER FREEZI is with A. Aronstamm, 105th and 3d avenue.

THERE are rumors that G. Merker is also there. Is it so, Merker?

THE Cincinatus W. France is located with Russell & Laurie, at Tarrytown, N. Y. May he tarry there long.

G. A. LAUFFER is a respectable married man, and owner of a first-class pharmacy in Bloomfield, N. J. Do not despair, ye batchelor drug clerks, your time will come.

THE two Stages * * * No! No! I mean the two brothers on the stage. Wrong again. The two Stage brothers. Hang it! I'm all mixed up. I mean to say that the brothers Stage, the youngest of '93 boys, have been located. F. W. Stage is junior in the firm of Smith & Stage, 57th street and 7th avenue, and J. Stage is with Hetherington, 4 Vanderbilt avenue..

"HAVE you any shaley beatie pills?" asked a lady, spelling the name from a paper.

"Never heard of the pills before, madam."

"Then you have a good deal to learn," snappishly.

Suddenly the face of this unhappy drug clerk lit up with a ray of hope.

"You mean Chalybeate pills? pink pills, made in Philadelphia?"

"That's just what I said. How much are they?"

"Fifty cents a bottle."

"What! I can get them for twenty-five cents at Barker's. The idea!"

There is a sick drug clerk in that locality.

C. W. WESTENFELDER is with Cassebeer, 72d street and Columbus avenue. We would like to hear from you, old boy.

C. A. VROMAN, JR., has been ordered to Colorado for his health. His position as assistant in pharmacy will be occupied by our dis-guished friend W. A. Hoburg, another '93 professor.

NOW, then, boys, get ready for the ball and begin to send orders for tickets. How many will you have? Next!

THE death of J. Niven Hegeman, secretary of the College of Pharmacy, removed from our midst one of the best known men and hardest worker of the college. For many years he read the roll of graduates on commencement night, and endeared himself to all the boys.

JULIUS TANNENBAUM, PH. G.
116 E. 116th Street.

Alumni Notes.

'94 NOTES.

PROF. RUSBY'S second lecture was delivered under the most favorable conditions on November 13th, the evening being an ideal autumn one. The house was filled from top to bottom with enthusiastic admirers of the Doctor, and his popular assistant, Prof. Jelliffe. But one thing marred the festivities of the occasion, and that was the untimely death of J. Niven Hegeman, Secretary of the College, deep regret was expressed on all sides for this popular officer. Dr. Rusby began with a systematic classification, after which the respective classes were taken up, and explained in a brief, but interesting manner. The stereopticon being used to portray the many points, many of which are to most of us, now but reminiscences.

Many of the innocent looking plants growing on roadsides and marshy lands particularly, and gladdening the heart of the weary traveler by their beautiful foilage, were pronounced guilty of producing toxic effects when taken internally, even the poor "murphy" under certain conditions acts violently; however, and fortunately in the latter case, heat destroys this effect. Several parties, notably Mrs. Van Brunt, were mentioned as having undergone heroic treatment, in order that these plants might be investigated and exposed. Ranunculacæ furnishing many topical species; some time was devoted to their consideration, and from the noise emanating from the '96 portion of the house, we would infer that the order has necessitated considerable activity in the cerebreal region of these gentlemen. A brief account of a spring contaminated by the presence of one of these plants, and causing illness to an entire family with the exception of the husband, who didn't drink water, furnishes food for thought.

Among those present at the lecture, I noticed Judge and Mrs. Roesch, Mr. Alfred H. Mason, Miss Mason and lady, Mr. W. E. Ebbit, '79, Mr. McMahon, etc. Our roll of honor consisted of Messrs. Burger, Herold, Sturzer, Wolff and Dr. Krueder.

AT last through the endeavors of Secretary Hoburg and Mr. Tannenbaum, we are assured of a reception and ball this winter. As to it being a success, there is no doubt, of this point we are assured of by some of our most conservative members, but the degree of its success remains with us to determine. We must exert ourselves and get the boys to come. Although the committee has secured Madison Square Banquet Hall, Eben's Band, etc., the tickets will be but one dollar, admitting both lady and gentleman. As but a short time remains before it is to take place, January 22d, we would suggest that the members begin their task at once. Remember, gentlemen, any surplus will be devoted to further the interests of both the Association and College.

PRESIDENT STOVER'S suggestion that we have an "open house," once a week, inviting members, graduates, undergraduates and friends to participate in various games of amusement, such as card playing, selections on piano, etc., is excellent. We sincerely hope it will be accomplished before the snow flies.

MR. WOLFF'S name being unintentionally omitted in last month's roll of honor, and the gentleman having notified me of the fact, I take this opportunity of remedying the oversight, as he is too active a member to be thus slighted.

OTTO RUZIKA and Henry Fendler are studying medicine in the University N. Y., their advanced pharmaceutical knowledge will undoubtedly prove an important factor during their studies.

MOSE KATZ has charge of the prescription department in Hoykendorf's new store, 87th street and Park ave.

WHAT'S the matter with Ehrgott, ditto Linnig, Wood, Brater and Col. Wade? These questions are put to me at every meeting. The gentlemen could relieve me of an embarrassing position by coming over occasionally and showing the boys that they are "still in the ring."

A little nonsense now and then,
Is relished by the best of men.

George Burger and "Tanny," with Stoerzer "on the side," furnished the talent to a recent side-splitting farce comedy in two acts, which would have to be seen to be appreciated.

MAX AUERBACH is riding a rambler racer in "Old Pensy," though now an enthusiast of his present college, the orange and blue Benzol ring always finds a conspicuous place on his suit.

How about an Alumni Glee Club?

THOSE present at Dr. H. A. Haubold's lecture last winter, cannot fail but remember how interesting it was. He will again lecture on December 11th. Won't you come?

NELSON S. KIRK, PH. G.
9 E. 59th Street.

'95 NOTES.

WELL, well! Another month has flown by, another Alumni lecture (by the way, a very interesting and educating lecture at that) has been delivered, another 30 days nearer to the College examination day, and still when you look back and think it over you are convinced of the truth of the saying that "time flies."

THE last lecture by Professor Rusby on "Poisonous Plants in the Vicinity of New York" was a "treat," in the real sense of the word, and it was appreciated as such by quite a presentable audience, in fact I believe that it was the largest assemblage which had ever been present at any of the series of lectures given under the auspices of the Alumni Society, since their introduction.

That Professor Rusby is very popular, could have been noticed by the attentiveness of his audience.

This feeling of friendship that graduates have for him, is one which is lasting, and we all thank him for what he has done for us and hope that we may hear from him again.

BREVITIES.

AMONG those present, the most prominent were Messrs. Dosh, Duerr, Ferguson, Flick and Manville.

The latter is still the Manville of old, he being "in for the fun" every time.

THE entire Alumni of the "First Aid to the Injured" College were present at Senator Roesch's address. Had they previously signified their intention, we would undoubtedly have given them a very hearty welcome.

THE entire attendance of the Post Graduate Course was eight, and out of this eight, seven are '95 boys, namely: Messrs. Bjorkwall, Dosh, Jorgensen, Niederer, Walters, Gies and Ferguson.

We all hope that they will uphold the record of our class and all appear on the stage at the next College Commencement.

WHILE attending one of Professor Chandler's lectures to the Senior Class, I noticed several familiar faces, amongst them being Messrs. Watling, Brandner, Kneuper, Irving, Musgrave and Austin.

All feel confident that Ph. G. will be added to their name next spring.

EX-SECRETARY THOMAS P. HEFFLEY and his brother C. C. Heffley have opened a store in Brooklyn.

HERMAN SCHMELZ is with Bendiner & Schlesinger, 11th st. and 3d ave.

WILLIAM MILLER is with J. Jungmann, 61st st. and 3d ave.

GEORGE OATS is with his father at 46th st. h ave.

EDWARD P. WEED has bought G. A. Gregory & Co.'s store on Wall st. and reports that business is "booming."

IRA E. BELFRY has gone back to Canada. Before he left he assured me that nothing but a longing for home persuaded his return. So please do not think bad of him.

MR. J. AQUARA is with Dr. Cassile, at 507 Pearl street; Mr. E. Murray is at Carpentier's pharmacy, at 8th avenue and 123d streets.

MR. E. L. FLICK is at Eschmann's pharmacy, at 51st street and 9th avenue.

MORE to come with next issue,

"THE '95 OBSERVER."

POST GRADUATE CLASS.

THE first meeting was held in the college building Wednesday, October 16, 1895. Harry B. Ferguson, Ph. G. temporary chairman.

It was moved, seconded and carried to have the offices of Secretary-Treasurer filled by one man.

After Mr. Jorgenson having declined the nomination for President, the following officers were unanimously elected: President, Rudolph Gies, Ph. G., class of '95; Vice President, Harry B. Ferguson, Ph. G., class of '95; Secretary-Treasurer, Herman Walter, Ph. G., class of '95. It was moved, seconded and carried, to call the class the "First Post-Graduate Class of the College of Pharmacy of the City of New York, 1896."

Moved, seconded and carried, to adopt Cushing's Manual, same to be recognized and abided by instead of a constitution and by-laws.

Question of Post Graduate pin was laid over.

Moved, seconded and carried, to post a copy of the minutes of the meeting, upon the bulletin board of the College.

Meeting adjourned.

Members of the Post Graduate class: Messrs Gies, class of '95; Ferguson, class of '95; Walter, class of '95; Niederer, class of '95; Bjorkwall, class of '95; Jorgenson, class of '95; Ogden class of '95; McCarthy, class of '93; Harding, class of '87.

R. GIES, PH. G., President.

HERM. WALTER, PH. G., Secretary.

Senior Class Notes.

THE third meeting of the Class was called October 30th. The Class-pin Committee reported that designs would be placed on the bulletin board for inspection by students. The attention of students is called to the previous notes in the JOURNAL on this subject.

IT was voted that an excursion be made to Dr. Squibb's laboratory on or about November 24th. Prof. Coblentz will be there to see that the boys do not interfere with the young-lady employees and incidentally he will explain the manner in which the important pharmaceutical preparations are made.

A COMMITTEE of three, two of which were young ladies of the class, was appointed by President Coats to investigate the matter of class flags and report at the next meeting.

FOURTH regular meeting of the Class held November 13th. An invitation has been extended to the class by the Pharmaceutical Club to use their rooms, if a glee club could be organized among the students. It is hoped that students gifted with any vocal talent will take advantage of this opportunity. A committee was appointed at this meeting to take charge of the matter.

AT a meeting held October 16th, a committee was chosen to draft a class constitution. At this meeting the constitution and by-laws, as arranged by the committee were read and unanimously adopted. The class motto and constitution will be published in next month's JOURNAL.

AT this meeting a class flag was submitted, having a blue background with N. Y. C. P. neatly woven in yellow, but many of the students prefer some design that will suggest a Pharmacy College, such as the Benzol Ring.

A SPECIAL meeting was called at 2 P. M., November 15th, and it was ordered that a copy of the resolutions of condolence in regard to the death of Mr. Hegeman be sent to the bereaved family of the deceased and a copy be sent to the faculty, also to bs spread on the minutes of the meetings.

JONATHAN MORRIS.

MR. H. G. STEINHAUER who for some time past, held the position as head clerk in Miss A P. Mahony's pharmacy, at 48 Putman avenue, Brooklyn, has resigned. He has accepted a position of like nature with H. G. Cassebeer, at 18th street and 6th avenue.

Junior Notes.

'96 CLASS NOTES.

Ethane, Methane, Cochineal,
Argol, Menthol, Bromethyl.
Wahoo! Wahoo! Wahoo Wix
N. Y. C. P. '96!

MR. AND MRS. NICHOLAS REINER, of Providence, R. I., made a pleasant call at the College. Mr. Reiner joined the '96 Junior Class, but owing to sickness was obliged to give up his studies early in the course. He has the honor of being the first of our number who has taken unto himself a wife although we hear of several contemplations.

A LADY reporter of the *World* staff visited the College and succeeded in gaining the fact that "in quiz ratings the ladies of the '96 Class took the lead." That looks as though woman's rights would predominate over Deutschberger's protective function.

TITLEBAUM knows a good thing when he sees it even if roses do cost 60 cents each.

SOME few evenings since a number of our students, accompanied by their lady friends, met at the parlors of Messrs. Finley and Smith and passed a very pleasant evening. Those in attendance formed the charter membership of the "Methane Club," which is expected to hold its meetings during the winter. Mr. Finley was chosen President and conducted the evening's entertainment in a creditable manner. The "light fantastic," tripped to the music of the Halcyon Mandolin andGuitarClub of Brooklyn, and the satisfying of the inner man at the spread, were among the enjoyable features of the evening.

THROUGH a series of meetings and a vocabulary of words that would have driven the heart of Caesar to despair, our Class has recently passed; but as yet succeeded, only, in adopting a class yell and class constitution. The adoption of the flag of the Class of '96 was voted upon and carried, then reconsidered and rejected in favor of one bearing the letters N. Y. C. P. in place of the Benzol ring. This was met with so strong an opposition that a division in the class was inevitable, and again a reconsideration is before the Class. Our Class would undoubtedly do well to take example from the Junior Class of '97, which we are glad to hear, is the most united class that ever entered the N. Y. C. P.

THROUGH the kindness of Dr. Gallant, of West 36th st., the course on "First Aid to the Injured" has been introduced and is being pursued by many of our members. Those of the Class of '96 wishing to join the society can obtain particulars of Secretary Butterworth.

ON Thursday, November 21st, we had the pleasure of accepting the kind invitation of Drs. E. R. Squibb & Sons, of Brooklyn, and visited their laboratories. It has been an annual custom for the Senior Class to make this excursion and was, without doubt, to the '96 boys extremely interesting and much appreciated.

THE lecture on "The Poisonous Plants of the Vicinity," given by Prof. H. H. Rusby and illustrated by colored stereopticon views, was very largely attended both by strangers and students of the College. About 75 of the '96 Class were present and after a few repetitions of the "war cry" were introduced to the audience by the Professor as being "only students of the Senior Class of the College." Undoubtedly the introduction was a soothsaying to some of the nervous members of the audience, whose ears were not accustomed to the cry of a College class.

A FEW INCOMPATIBLES.

PROF.—"What effect has a deodorizer on unpleasant odors?"

STUDENT—"It bleaches them."

PROF.—"What do you do with the chloroform extract in the estimation of alkaloids?"

STUDENT—"Evaporate by 'stontaneous combustion.'"

RUSBY—"How would you administer mustard as an emetic?"

STUDENT—"One desert spoon full of the oil in a pint of water, dose to be repeated not more than twice."

RUSBY—"Would you attend the funeral or stay at home?"

PROF.—"Well, Mr. Terry, can you tell me the medicinal properties of Anise Oil?"

MR. T.—"No, Sir."

PROF.—"Sorry, Mr. Terry, but you will undoubtedly learn when you become a father."

ONE of our Long Island students has really learned from practical experience that the amount of Ferric Iron is much greater in Tr. Ferric Chloride than in his solution of Precipitated Sulphur.

PROF. DIEKMAN enlightens Section two of the fact that "if the official shape of Phosphorus pills had been uare the average standing would have been nearly perfect."

FAMILIAR QUOTATIONS.

"Mr. Regal, you was once a baby, but you are no more."—*La Rusby.*

"It's our duty and we shall see that the College rules are enforced."—*Elliott.*

"I'll see you next year."—*Schuyler.*

"The Committee is in favor of N. Y. C. P. and I should think that ought to bear pretty heavy for our s e.—*Finley.*

C. WETMORE SMITH, Rep.

'97S' FIRST RACKET, OR ODE TO '97.

'Twas in the year of '95,
When down Broadway the class did hie,
Koster and Bial's their destination.
Bent on a night of dissipation.

November 6th, election day,
Everything went the Republican way,
It mattered not to the boys at all,
And down the street came that awful brawl.

Roller, Roller, Roller Ree!
What's the matter witn pharmacy?
Roller. Roller, Roller, Ree!
Chemistry and Botany!
All good pharmacists go to Heaven,
So will the class of '97.
N. Y. C. P.
Roller, Roller, Roller, Ree!

They yelled and shouted until hoarse,
And the manager he did kick, of course,
But they didn't care a bit,
And with their yell, they made a big hit.

Star in the firmanent of the class,
The boys were'nt in it, alack and alas.
Schuyler went with them and "cut lots of ice,"
Flick more than repaid the boys for the price.

Alas, 'tis over, the deed is done,
The boys broke up a little past one,
The writer is glad he can relate,
That each one was able to walk very straight.

Some went one way, some another,
Perhaps, some had to explain to their mother,
Of course, they told of the evening's joys.
And what a nice crowd were the C. P. boys.

Long may the class live,
And triumph through strife,
And at last may each fellow,
Find himself a good wife.

ONE WHO DIDN'T GO.

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