Report on the Progress of Pharmacy

For the Year 1912

(Fourteenth Installment.)

ANTIPYRINE DERIVATIVES.

Mannich and Krösche call attention to the fact that the already observed precipitate occurring when antipyrine solution is mixed with formaldehyde and ammonia (or with hexamethylene-amine) is a distinct combination of the three substances having the formula $C_{30}H_{39}O_3N_7$. The same substance is obtained when antipyrine, formaldehyde and ammonium chloride are mixed, but when antipyrine, formaldehyde and hydrochloric acid are combined there is produced methylene bis-antipyrine, $C_{23}H_{24}O_2N_4$ which also results along with formaldehyde and ammonium chloride when the hexamethylene-antipyrine body $C_{30}H_{39}O_3N_7$ is heated with hydrochloric acid.

This decomposition reaction suggests that the new base is either a derivative of the bis-antipyrine body or that the hydrolysis first produces antipyrine and formaldehyde and that these two substances then react to produce the bis-antipyrine body and that the latter is true is shown by the fact that the bis-antipyrine body does not form if the hydrolysis is accomplished in the presence of something—example, sulphurous oxide—which will combine with the formaldehyde the moment it is liberated.

The hexamethylene-antipyrine body is shown to be tris-antipyril-tris-methylene-amine $(C_{11}H_{11}N_2O\text{-}CH_2)_3N$ and similar condensation products can be made, as shown below, from antipyrine derivatives and analogues. The combinations, because of their slight solubility, are of but slight therapeutic value and by reason of possible formation of these bases under influence of the hydrochloric acid of the gastric juice, antipyrine and hexamethylene-amine should not be prescribed together.

The following bodies were prepared during the investigation:

1. *Tris - antipyril - tris - methylene - amine.* Small crystals, M. P. 259-260°.

2. *Hydrochlorate of same.* White crystalline powder, M. P. 178°.

3. *Methylene-bis-antipyrine.* $C_{23}H_{24}O_2N_4$, melting (when dried) at 179°.

4. *Bi-hydrochlorate of same.* Small crystals, M. P. 120-125°; when free from water, a crystalline powder, M. P. 200-220°.

5. *Monohydrochlorate of same.* Large soft crystals, M. P. 94-95°; when free from water, M. P. 100-110°.

6. *Tris - tolypyryl - tris - methylene - amine,* $(C_{12}H_{13}N_2\text{-}O\text{-}CH_2)_3N$. Small crystals, M. P. 214-215°.

7. *Hydrochlorate of same.* Short white crystals, M. P. 100-105° when air dried; 191° when completely dried over sulphuric acid.

8. *Methylene-bis-tolypyrine,* $C_{25}H_{28}O_2N_4$, obtained along with formaldehyde and ammonium chloride, when "7" is hydrolysed with 5% HCl. Fine white matted crystals (M. P. 190° when completely dry), which were also prepared by action of formaldehyde on tolypyrine.

9. *Tris - homo - antipyrine - tris-methylene-amine.* $(C_{12}H_{13}N_2\text{-}O\text{-}CH_2)_3N$, obtained by treating homo-antipyrine with hexamethylene tetramine in the presence of hydrochloric acid and then making mixture alkaline. Small white shining crystals melting at 280°.

10. *Hydrochlorate of same.* Fine hygroscopic crystals, melting at 202°.

11. *Methylene-bis-homo-antipyrine.* $C_{25}H_{28}O_2N_4$, obtained along with formaldehyde and ammonium chloride when "9" is hydrolysed with 5% HCl. Combines with one molecule of water, forming small crystals, melting at 120-130°, and when completely dry it melts at 105-106°.

12. *Bi-hydrochlorate of same.* White loose crystal masses, M. P. 200-210°.

COMPOSITION OF TANNIN.

K. Feist reports his study of tannin obtained from Turkish and from Chinese nut-

galls. He reviews his prior work of obtaining from commercial tannin a pure crystalline body, which he called gluco-gallic acid, and he now discusses its preparation from Turkish galls (by extraction in Soxhlet's apparatus first with chloroform, then with benzene to remove fat, wax and other impurities, and then removal of the pure body by extraction with absolute ether) and the physical properties of the glucogallic acid, including optical rotation $[\alpha]D^{17} = +10.6°$. He finds that glucogallic acid has the molecular weight 318.2 (calculated by titration with N/10 alkali) or 315 (by increase of boiling point); that one molecule of it hydrolyses to one molecule of gallic acid and one molecule of glucose; that it contains water of crystallization and that its formula is either $C_{13}H_{16}O_{10}H_2O$ or $C_{13}H_{14}O_9 2H_2O$. It is not hydrolysed by action of emulsin; it contains no aldehyde group, but does contain a phenol group.

The latter part of the paper deals with tannin from Turkish nutgalls. This tannin, purified by the chloroform-benzene-ether method described above, hydrolysed with normal sulphuric acid, yielded gallic acid and dextrose, but not much of the latter (as much as 20%) was decomposed during hydrolysis; hence the proportion of the two products of hydrolysis could not be determined. The optical rotation of tannin is $-[\alpha]D+28.6°$ to $+31.8°$; molecular weight estimations are reported and a comparison of the methyl compounds of the two tannins—Chinese and Turkish—is presented.—Arch. d. Pharm., 250 (1912), No. 9, 668. (H. V. A.)

ALKALOIDS OF PAREIRA BRAVA.

M. Scholtze publishes a critique of a paper on this topic by Faltis (Monatsheft f. Chem., 33—1912—873), correcting by past experiments and some just carried out several of Faltis' conclusions; notably that the latter's iso-bebeerine is not $C_{21}H_{23}NO_4$, but is $C_{17}H_{19}NO_3$.—Arch. d. Pharm., 250 (1912), 684. H. V. A.

DEXTROGYRATE LUPANINE.

A. Beckel reports further work on this alkaloid as conducted by Professor Ernst Schmidt and his pupils. The paper gives table of yield of alkaloid by different methods of extraction from Lupin seed, followed by physical data relating to d-Lupanine $C_{15}H_{24}N_2O$ (M. P. 200°) and to oxy-lupanin $C_{15}H_{24}N_2O_2$ (M. P. 205-206°), both of which were obtained from the crude alkaloid. Oxidation of the d-lupanine with chromic acid mixture, with hydrogen dioxide, both 3% and 30%, and alkaline potassium permanganate was tried. The yield of oxidized product in the first two cases was too small for satisfactory examination, but the permanganate product gave a gold salt (M. P. 188-189°) and a platinum salt $(C_{15}H_{24}N_2O_2 HCl)_2 PtCl_4+2H_2O$. With bromine either in aqueous, alcoholic or acetic acid solution, lupanin forms an orange red precipitate. This does not mean (as previous investigators have reported) a splitting of the lupanine, but the product consists of a mixture of the dihydrobromides of lupanine, of oxy-lupanine, and of ethoxy-lupanine. These, Beckel has been able to separate by fractional crystallization.

Ethoxy-lupanine dehydrobromide $C_{15}H_{23}N_2O\ O\ C_2H_5 2HBr$ melts between 228 and 236° and has optical index αD—129.4°.

Ethoxylupanine hydriodide prepared from the hydrobromide with hydriodic acid as needles melting at 221-222°.

Ethoxy-lupanine-di-sulphocyanate, $C_{15}H_{23}N_2O\ C_2H_5 2HSCN$, by treating the hydrobromide with ammonium sulphocyanate colorless needles, M. P. 172-174°.

Ethoxy lupanin gold chloride, M. P. 145-150°, a crystalline combination of 2 molecules of the ethoxy-lupanin hydrochlorate with one and two molecules of $AuCl_3$ respectively.

A reduction product, prepared by treating the hydrobromate with hydriodic acid. This was a base whose iodo-methylate has same formula as the iodo-methylate of d-lupanine, $C_{15}H_{24}N_2OCH_3I$, and resembles it in all respects save in its gold and platinum salts.

The article closes with description of the other dehydrobromides mentioned above.—Arch. d. Pharm., 250 (1912), 691. (H. V. A.)

GUNPOWDER IN MEDICINE.

F. Berger presents an interesting historical paper showing use of gunpowder in medieval and folk medicine.—Schweiz. Wschr. f. Chem u. Pharm. L (1912), No. 49, 729. (H. V. A.)

WATER AND HYDROGEN DIOXIDE AS ACIDS.

Dr. J. Sperber presents his views on this subject, which includes the idea that metallic

hydroxides are primary salts (e. g. NaHO), while the metallic oxides are secondary salts (e. g. Na_2O). He calls such "salts" *aquates*, while corresponding metallic peroxides, he calls *hyperaquates*. This, according to his reasoning, eliminates bases from chemical nomenclature and he also seems to be of the opinion that the word "acid" will also disappear by considering all acids as salts of the "metal" hydrogen. The question of alkalinity and acidity he disposes of by calling attention to the fact that some normal salts (e. g. Na_2CO_3) are distinctly alkaline and that alkalinity and acidity are, therefore, functions of the individual ions rather than characteristics of two classes of compounds. He promises experimental work that will prove his contention.—Schweiz. Wschr. f. Chem. u. Pharm. L (1912), No. 50.—(H. V. A.)

FOCKE'S ASSAY OF DIGITALIS.

Dr. James Burmann publishes a short article strongly criticising all physiological digitalis assays with the frog, and particularly the method recommended by Focke.—Schweiz. Wschr. f. Chem. u. Pharm. L. (1912), No. 51, 757.—(H. V. A.)

LITHIUM.

F. Berger gives an interesting outline of the history of this metal and its supposed therapeutic action. The paper is accompanied by an excellent bibliography. — Schweiz. Wschr. f. Chem. u. Pharm. L. (1912), No. 40, 597. (H. V. A.)

CANTHARIDAL COLLODION.

In the last revision of the Swiss Pharmacopoeia the recipe for cantharidal collodion was so changed that instead of dissolving in flexible collodion an ethereal extract of cantharides, the preparation was "improved" by "dissolving" cantharidin in flexible collodion in proportion of 1 to 250. "E. B." calls attention to the fact that cantharidin will not dissolve in that proportion, its solubility in ether being 1 to 650 and in ether-alcohol mixture (similar to collodion) 1 to 460. He further proves his point by carefully preparing the cantharidal collodion as per directions of the present Swiss Pharmacopoeia when he found considerable of the cantharidin remained undissolved. He therefore suggests a recipe consisting of catharidin 0.2 gm., castor oil 5 gm., acetone 7 gm., larch turpentine 8 gm. and collodion 80 gm.—Schweiz. Wschr. f. Chem. u. Pharm. L. (1912), No. 45, 673. (H. V. A.)

SWISS TINCTURES AND FLUIDEXTRACTS.

Dr. Th. Knapp publishes a table showing the specific gravity and percentage of extractive (dried at 100°) of each of the tinctures and fluidextracts of the Swiss Pharmacopoeia as prepared in his own pharmacy.—Schweiz. Wschr. f. Chem. u. Pharm. L. (1912), No. 45, 676. (H. V. A.)

CULTIVATION OF MEDICINAL PLANTS.

Dr. Kurt Siegfried gave a lecture on this topic before the Swiss Apotheker Verein, outlining work done on this line in other countries, amount of drugs imported that might well be raised in Switzerland, and closing with some suggestions as to drug raising in general.—Schweiz. Wschr. f. Chem. u. Pharm. L. (1912), No. 46 and 47, 689 and 70. (H. V. A.)

VOLUMETRIC ESTIMATION OF IODIDES.

The assay process of Rupp and Schirmer for estimation of ferrous iodide by use of ferric chloride as oxidizing agent, suggested to W. Schirmer similar assays for the alkaline iodides. Potassium iodide can be assayed by dissolving 0.4 gm. KI in 20 cc. water, adding 5 gm. solution ferric chloride (of German Pharmacopoeia), letting stand an hour, then diluting with 100 cc. water, then adding 10 cc. 25% phosphoric acid, followed by 0.5 gm. KI (to dissolve separated iodine) and finally titrating with tenth-normal thiosulphate. Iodine can also be liberated from the iodide with sodium nitrite if precautions are taken to remove the excess of N_2O_3 produced by the reaction. Urea accomplishes this aim, the proper proportion being KI 0.5 gm., urea 1 gm. and nitrite 0.1 gm. Potassium iodate serves a similar purpose provided borax is added to neutralize excess of iodic acid. Details of this assay are given in the original paper.—Arch. d. Pharm., 250 (1912), No. 6, 448. (H. V. A.)

STARCH GRANULES AND A "ZAHLKAMMER."

Hartwich and Wichmann describe the difficulty in securing by microscopic means accurate results when estimating the amount of an adulterant in a powder mixture. To secure the needed accuracy they have devised a microscopic ruled slide that is a modification of the blood count slide. Their slide has etched upon it 100 squares, each of 1.5

square millimeters area. The squares are enclosed in a chamber, the walls of which are strips of cover glass 0.25 mm. thick. Into this chamber the powder (or usually its dilution with pure sugar, 1 to 100 or 1 to 1000) is placed, carefully weighed, and then a definite quantity of water (3 to 4 drops) is added and a cover glass placed over the chamber and the powder examined. On addition of the water, the sugar dissolves, leaving the powder, sometimes in very minute quantities, distributed over the slide, and a counting of the characteristic plant elements in three or four of the 1.5 square millimeter spaces usually furnishes a safe average.

A typical report is one on the percentage of clove stalks in a sample of powdered cloves. The stalks contain characteristic stone cells and from their number, the percentage of adulteration was deducted by the following reasoning: 0.01 gm. of a 1% triturate of clove stalks (0.0001 gm. of the stalks themselves) was put into the slide and on counting in three different experiments, 173, 166 and 156 stone cells were found. That is, there was an average of 165 stone cells to each 0.0001 gm. clove stalks or one stone cell to each 0.00000061 gm. clove stalk powder. Taking as "unknown" a sample of powdered cloves, that had been admixed with clove stalks, the observer calculated by count of the stone cells that the powder contained 15.65 percent stalks. In truth, 15 percent had been added.

The adulteration of saffron with sandal wood could likewise be proven by the wood particles, but this was more difficult, since the wood cells are not of uniform size. The average, however, was one wood cell to 0.000000028 gm. of powdered sandal wood.

Discussing starch granules, it is shown that the moisture of the different starches varies from 11.68 percent in wheat starch to 15.53 percent in canna starch.

From count of the several air-dried starches, was deduced the following weight of their granules:

Rice starch.....	0.000000000018 gm.
Corn starch.....	0.00000000082 gm.
Arrowroot starch....	0.0000000073 gm.
Wheat starch.....	0.000000000069 gm.
Canna starch.....	0.000000036 gm.
Potato starch.....	0.0000000076 gm.

The rest of the paper is given to discussing the relationship of size and weight of the granules and the verification of data so obtained by calculation of the density of the granules. The writers confirm Flukiger's statement of the marked difference in density if the granules are air-dried or dried at 100°, and also the interesting fact that while air-dried potato starch is lighter than arrowroot starch, when both are dried at 100° the potato starch is much heavier.—Arch. d. Pharm., 250 (1912), No. 6, 452. (H. V. A.)

Two New and Very Delicate Tests by use of the Reagent "Tetramethyl Base."—This is a modification of Trillat's test for traces of lead and manganese, as suggested by R. J. Carney, by means of the organic base tetramethyl diamino diphenylmethane, $((CH_3)_4N_2(C_6H_4)_2CH_2)$, later named "tetra methyl base" by Arnold and Mentzel to distinguish it from p-phenylenediamine, which had long been known as "tetra base."

The base is prepared as follows: A mixtrue of 30 gms. dimethylanilin, 10 gms. of formaldehyde, 200 cc. of water and 10 cc. sulphuric acid, is heated for one hour on a water bath, cooled, made alkaline with an excess of sodium hydroxide and the excess of dimethylanilin removed by steam distillation. Cool the contents of the retort, filter, wash well with water, and recrystallize once from alcohol.

Carney recommends the use of citric acid in place of acetic as originally used by Trillat, as being more stable towards light and does not form a precipitate on heating.

The reagent is made up by dissolving 2.5 gms. of the "tetra methyl base" in a solution of 10 gms. of citric acid in 10 cc. of water, afterwards diluting to 500 cc.

With any compound of lead or manganese in which the metal has a valence of more than two, a cold solution of the reagent will give a deep reddish purple color, due to an oxidation product of the reagent.

The reagent is proposed as a very delicate test for gold and ammonia, whereby 0.01 mg. gold in 50 cc. of solution may be detected, and from 0.01-.02 mg. NH_3 in the same amount of liquid.

With very dilute solutions of gold chloride, this reagent forms a very beautiful purple color, which soon changes to blue and then becomes colorless, the blue color reappearing upon warming. Platinum, paladium or other elements, do not interfere, but free mineral acids must be neutralized, then made acid with acetic or citric acid.

Ammonia may be detected with great accuracy by distilling from an alkaline solution and holding a piece of filter paper, moistened with a solution of 2 gms. of manganous sulphate and 5 cc. of hydrogen peroxide solution in 200 cc. of water, in the current of steam as it issues from the tube. Ammonia, if present, forms a brown spot, which turns purple when moistened with the organic reagent.—Journal American Chemical Soc., Jan., 1912, p. 32, v. 34. (L. A. B.)

The Leaf Oil of the Washington Cedar (Thuja Plicata).—According to R. E. Rose and Carl Livingston, the leaves and twigs of *Thuja plicata* yield about 1 percent of a clear, light yellow oil, with the characteristic odor of cedar boughs. The following constants were found: sp. gr. 20° C.=0.913; refractive index 20° C=1.4552; sp. rotation 20° C=—4.77°; acid number=0.518; ester number=2.28; saponification number=2.8; acetylation number=8.8.

An elementary analysis showed the absence of sulphur and nitrogen, and to contain C=78.6 percent; H=10.4 percent; which agrees very closely with that of a bicyclic ketone, $C_{10}H_{16}O$. The oil contained no phenols and was soluble in all proportions of anhydrous organic solvents and in 70% alcohol.

From the analytical results submitted, the authors conclude that the volatile oil of thuja plicata is composed of 80 to 85 percent thujone, 3-5 percent pinene, 1-2 percent tanacetyl acetate, 1-3 percent tanacetyl alcohol, leaving about 10 percent to be accounted for by loss due to formation of resin during distillation and experimental losses.—Journ. Am. Chem. Soc., Feb., 1912, v. 34, page 201. (L. A. B.)

The Reduction of Vanadic Acid in Concentrated Sulphuric Acid by Hydrogen Peroxide and Persulphates.—According to J. R. Cain and J. C. Hostetter, pentavalent vanadium can be immediately and quantitatively reduced to the quadrivalent condition by means of hydrogen peroxide or the peroxide of zinc, barium, magnesium or sodium in the presence of concentrated sulphuric acid. Molybdenum, titanium or iron do not interfere.

It was also found that concentrated sulphuric acid solutions of vanadium pentoxide could be reduced with persulphates.

The process is carried out by evaporating a solution of vanadium with concentrated sulphuric acid until fumes are given off freely, cool, add a slight excess of 3% H_2O_2, cover the flask and fume strongly for a few minutes more to destroy the excess of peroxide, after which the solution may be titrated against permanganate.—Jour. Am. Chem. Soc., March, 1912, vol. 34, page 274. (L. A. B.)

Syrupus Ferri Iodidi.—O. J. Cloughly, St. Louis, suggests the following as an improved process for syrup of iodid of iron:

Iron Wire (bright and cut in small pieces)	12.5 gm.
Iodine	41.5 gm.
Citric Acid	4 gm.
Sugar	600 gm.
Distilled Water, q. s.	
Solution Potassium Hydroxid	50 cc.

Place the iron wire in the solution potass. hydroxid in a proper container; shake it well for about ten minutes, decant and wash the iron thoroughly with distilled water; decant and repeat the operation until the iron is entirely free from the slightest trace of the hydroxid, then proceed with the directions of the U. S. P., replacing the dilute hypophosphorous acid with four grams of citric acid.

The cleansing of the iron wire with the hydroxid solution leaves the iron free from oxid or any other substance that might cause the finished product to turn dark. The hypophosphorous acid forms iron hypophosphate, which easily turns dark; the citric acid forms the citrate of iron, which gives the finished product the required green color.—Proc. Missouri Phar. Assoc., 1912, pp. 133, 134. (E. C. M.)

Elixir Ferri, Quininae et Strychninae Phosphatum.—O. J. Cloughly, of St. Louis, suggests the use of sodium hydroxide in the Elixir of Phosphates of Iron, Quinine and Strychnine and the elimination of the acetic acid and carbonate of ammonia. He proposes the following formula:

Soluble Ferric Phosphate	17.500 gm.
Quinine	8.750 gm.
Strychnine	.275 gm.
Phosphoric Acid	2 cc.
Solution sodium hydroxid	q.s.
Distilled water,	
Aromatic Elixir, of each	q. s.

Dissolve the quinine and the strychnine in the alcohol, then add the phosphoric acid

and 350 cc. of aromatic elixir. Dissolve the ferric phosphate in 30 cc. of distilled water by the aid of a gentle heat and add the solution of sodium hydroxid to almost neutralize the solution (be careful not to get it too strong or it will throw out the alkaloids), and add enough aromatic elixir to make the product measure 120 cc. Finally mix the two solutions and filter. Add enough simple elixir to make 1000 cc.—Proc. Missouri Phar. Assoc., 1912, p. 133. (E. C. M.)

Tinct. Opii Deodorati.—William K. Ilhardt, of St. Louis, discusses the preparation of deodorized tincture of opium from deodorized opium and suggests the following process for preparing the same:

Deodorized granular opium, (12-12½%)	100 gm.
Alcohol	200 cc.
Water, q. s.	1000 cc.

Heat 500 cc. of water to boiling, pour it on the granulated opium contained in a suitable vessel, stirring occasionally during 24 hours. Then transfer the mixture to a percolator, return the first portion of the percolate until it runs through clear, and continue the percolation until the opium is exhausted. Reserve the first 650 cc. of percolate, add to this the alcohol, and evaporate the remainder on a water bath until it measures 100 cc. Allow it to cool and mix with the reserved portion; filter this mixture, rinse the dish with water and pour on the filter, using sufficient to make 1000 cc. of tincture.

The alcohol is added to the reserved portion to preserve it, since it is not evaporated as in the official process.

One advantage of the proposed *technique* is that the bulk of the extract and the alkaloids are not subjected to prolonged heat.—Proc. Missouri Phar. Assoc., 1912, pp. 112-3. (E. C. M.)

Tinct. Opii Deodorati.—O. J. Cloughly, of St. Louis, suggests the use of paraffin in making deodorized tincture of opium, to replace the benzin of the official process:

Granulated opium	100 gm.
Paraffin	q. s.
Alcohol	200 cc.
Water	q. s.

Heat 500 cc. of water to boiling and pour it on the granulated opium contained in a suitable vessel, stirring the mixture frequently during twenty-four hours. Then transfer the mixture to a percolator, return the first percolate until it runs through clear and when the liquid ceases to drop, continue the percolation with water until the opium is exhaused; concentrate the percolation by evaporation over a water bath until it measures 150 cc. Take about 60 grams of paraffin and melt to a liquid and add to the opium while it is still hot and beat the two together for about five minutes, then set aside to cool. When cool, break a small hole through the paraffin, which will rise to the top, and drain off the opium, which will be completely deodorized. Mix the deodorized liquor so obtained with 600 cc. of water, filter and add the alcohol; wash the filter with sufficient water to make 1000 cc.—Proc. Missouri Phar. Assoc., 1912, p. 132. (E. C. M.)

Alcoholic Assay by evaporation method.—Mr. Claude Mason, state chemist of Idaho, reviews the different methods of alcoholic assay and recommends the following method as one of easy application by pharmacists in determining the alcoholic content of their preparations. The specific gravity of the sample is determined. Then 50 to 100 cc. is carefully evaporated to about one-fourth of its original volume. This is returned to the measuring flask and distilled water is added sufficient to make it of its original volume. The specific gravity of this is then taken. Add one to the specific gravity of the original sample and subtract the specific gravity of the de-alcoholized product from this and the difference corresponds to the specific gravity of the alcoholic sample. The percent of alcohol is then found by referring to the specific gravity tables of the Dispensatory, all taken at 60° F. or 15.6° C.—Proc. Idaho Phar. Assoc., 1912, pp. 22, 23. (E. C. M.)

Coal Tar Products and the Drug Trade.—Charles B. Kelsey, of Grand Rapids (?), says that coal tar is one of the three residuals of most importance in the manufacture of coal gas, about twelve gallons of this product being obtained from every ton of coal carbonized. The utilization of coal tar products as applied to the manufacture of dyes and medicinal preparations, is monopolized by the German laboratories on account of the great difference in wages received by the chemists of that country compared with those of America. Only two of the so-called

coal tar products handled by druggists occur naturally in coal tar—Naphthaline and the various grades of Carbolic Acid. Naphthaline is mostly known to druggists as Moth Balls, Moth Flakes, etc. The druggists of the United States handle about 5,000,000 pounds a year of this substance as moth preventives. Its effectiveness for this purpose depends upon the distaste which the flying moth has for its odor.

The other natural derivative handled by druggists is Carbolic Acid, under the names of Phenol U. S. P. and Cresol U. S. P. Both of these are known as Carbolic Acid, one termed crystallized, and the other carbolic acid for disinfecting purposes. The latter is not always U. S. P. Cresol, as a less highly refined grade is as satisfactory for this purpose.—Proc. Idaho Phar. Assoc., 1912, pp. 10-12. (E. C. M.)

Coal Tar Products and their Manufacture.—George McDermand, the chemist of the tar department, Denver Gas and Electric Light Co., furnishes an interesting paper on coal tar products, giving their methods of manufacture, uses, etc., avoiding the use of technical terms as far as possible, so as to make it intelligible to the average pharmacist.—Proc. Idaho Phar. Assoc., 1912, pp. 36-40. (E. C. M.)

Biologics, their specificity.—Mr. W. F. Richter, of Berkeley, Cal., contributes an interesting paper on this subject in which he says: "In some diseases, such as diphtheria and tetanus, the causative organisms remain at the point of introduction into the body. The diphtheria bacillus remains localized in the 'patch.' During their growth they elaborate very potent toxins or poisons which are carried to the various tissues of the body upon which each exerts its particular action, producing a symptom complex characteristic of the disease. It is probable that in these cases the body not only forms substances antagonistic to the existence of the bacteria, but also substances that have a neutralizing effect upon the toxin. By isolating these toxins and injecting them into animals, large amounts of these toxin neutralizing bodies (anti-toxins) are produced. Here again these substances show a true specificity in that the serum of animals immunized against diphtheria toxin will neutralize only diphtheria toxin and not tetanus toxin. Likewise, tetanus antitoxin will only neutralize tetanus toxin."

The lower animals are immune to syphilis, typhoid fever and other diseases which affect mankind, and fowls are able to withstand many times the quantity of tetanus toxin that would kill a horse. Yellow fever rarely occurs in the negro race. Such insusceptibility is termed inherited immunity. In contradistinction to this form is acquired immunity(which may be either natural or artificial.) He describes the methods of acquiring the latter immunity, both active and passive, describes vaccines and serums and calls particular attention to the fact that failure in many cases to cure, may be due to lack of proper selection of the bacterial vaccine or serum.—Proc. Idaho Phar. Assoc., 1912, pp. 29-34. (E. C. M.)

Spiritus Ammoniae Aromaticus.—Dr. Linwood A. Brown concludes from a study of the storage of this preparation extending from March to June, 1911, that it should be kept in glass or rubber-stoppered bottles, at a temperature not exceeding 15° C. or 60° F. and not at so low a temperature that the ammonia salt shall be deposited.—Proc. Kentucky Phar. Assoc., 1912, pp. 136-139. (E. C. M.)

Liquor Sodae Chlorinatae.—Mr. E. F. Kelly, of Roland Park, Md., after a study of this preparation and a comparison of the method for its manufacture with that of the method for Liquor Potassae Chlorinatae N. F., says that the latter process is the better one for the manufacture of the soda preparation, with the necessary change of ingredients, etc., and with the correction that the final quantity should be 1000 grams.—Proc. Md. Phar. Assoc., 1912, pp. 132-134. (E. C. M.)

Pharmacopoeial Plants of Maryland, etc.—Prof. Charles C. Plitt, of the University of Maryland, makes an analysis of the sources of the articles included in the Pharmacopoeia and finds that 638 of them are of botanical origin and urges pharmacists to take more interest in that side of their profession, declaring that they will be more than repaid in the pleasure derived from the study.—Proc. Md. Phar. Assoc., 1912, pp. 94-98. (E. C. M.)