The "United States Dispensatory" states that upon "prolonged heating of the dried gum, arabic acid is changed to metarabic acid. Sulphuric acid will also change arabic to metarabic acid."

Thirty-five-gram samples of powdered acacia were treated with 7 cc. sulphuric acid, 70 cc. alcohol and 14 cc. water and allowed to stand one day. The residue was washed with alcohol and water and filtered on a suction filter. The precipitate was dried and then water was added to it. Thirty-five grams of the above treated acacia dissolved in water to 200 cc. (two times the U. S. P. formula) produces a thick opaque mucilage resembling that of starch paste.

Since prolonged heating of acacia produces metarabic acid with the resulting thick mucilage of acacia, and the direct chemical change of arabic acid to metarabic acid with sulphuric acid with the production of a thick mucilage from the acid treated acacia, it is possible that the increased viscosity of the mucilage made from heated acacia is caused by the formation of metarabic acid.

SUMMARY.

1. Heat applied to powdered acacia increases the viscosity of the mucilage. Prolonged heating at 100° C. produces maximum viscosity.

2. Heat applied to the mucilage of acacia does not thicken the mucilage.

3. Volatile matter other than moisture is lost at 100° C. This indicates a chemical change.

4. Metarabic acid is formed upon heating powdered acacia.

5. Upon preparing a mucilage from acid treated powdered acacia a very thick mucilage is obtained.

6. Statements No. 4 and No. 5 may indicate that the thick mucilage obtained with heated powdered acacia is due to the change of arabic to metarabic acid.

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THE MARKET QUALITY OF PHARMACEUTICAL RAW MATERIALS.*

BY GEORGE E. ÉWE.

It has been aptly said that adulteration of raw materials offered to the pharmaceutical industry is a "dead issue," and this does appear to be mainly true in so far as wilful adulteration is concerned. Yet much remains to be done to eliminate minor defects in supplies of raw materials and to assure uniformity in successive supplies of certain of these materials.

The raw materials examined in the Laboratories of the Tailby-Nason Company, Boston, Mass., during the past several years presented a goodly proportion of defects, aside from divergences from standard due to natural variation in proximate constituents; approximately 1.5% of the items being deficient in some way.

While this proportion of defects may seem excessive to the uninitiated the actual conditions are far more encouraging, since most of the defects noted were

* Scientific Section, A. PH. A., Baltimore meeting, 1930.

of a comparatively minor character. The work covered routine chemical examinations of samples of about 3200 shipments of raw materials and since these materials were received from an extremely large number of different representative American sources, the results of the work would seem to be somewhat indicative of the practical chemical quality of raw materials being offered in the market.

On the whole, from a practical viewpoint, the quality of raw materials is quite satisfactory in general and shows great improvement over the conditions existing some years ago.

However, the label of a raw material does not always precisely indicate the identity, strength and purity of the material and laboratory examination must not be dispensed with if finished products are not to be at fault. In addition to the defective materials met with, important variations in proximate constituents of vegetable drugs and variations due to volatilization, efflorescence, deliquescence, oxidation, and so forth, need always to be guarded against. Official substances, as a rule, show a good conformance with official standards but unofficial substances show wide variations, due to the different standards of individual manufacturers. This is one of the most difficult phases to contend with in control work and improvement is badly needed. On page 416, of the April 1929 issue of the JOURNAL A. PH. A., Chairman E. N. Gathercoal, of the Committee on Standards of Drugs and Chemical Products of the A. PH. A., which has for its object the development of standards for non-official drugs and chemicals employed in Pharmacy, asks the other members of his Committee: "Is there an opportunity for this Committee to serve Pharmacy?" There seems to me to be no doubt of the need of this Committee in the interests of Pharmacy. There is much to be done in the direction of securing uniformity in the purity and strength of many raw materials which are widely used but of insufficient importance for official recognition. Some of the items in this present article illustrate the need for work of Prof. Gathercoal's Committee. Incidentally, certain items may be of interest to the U. S. P. and N. F. Revision Committees.

In former years many dealers frequently neglected to take advantage of the prestige conferred by the use of official quality designations on even strictly official materials. Even now, occasionally, strictly official materials bear no quality designations. For instance, a lot of "mercurous chloride, mild" with no quality designation was strictly U. S. P. in quality. The label was printed wholly in English but with metric equivalent of avoirdupois weight. Possibly, this form of labelling had been adopted in order to facilitate marketing in other countries besides the United States, but even then it would seem desirable to have included some form of quality statement on the label. More often, when official substances are not designated "U. S. P." or "N. F." they show minor deviations from standard. In several instances, materials specified as "U. S. P." or "N. F." have proven distinctly sub-standard and this practice was not confined to dealers possessing meagre testing facilities. In some cases, full price was charged for a distinctly inferior product; needless to say, there is strong objection to this, but of more importance is the objection from the standpoint of the composition and legal labelling of the finished product in which it finally appears.

The following items detail the defects and variations met with which it was judged might be of interest to those concerned in pharmacy in general. It is

hoped that these items may be of particular assistance to other laboratories engaged in testing similar materials and that this paper may be instrumental in inducing these other laboratories to reciprocate with contributions of a like nature.

Acacia, Powdered.—One lot was musty.

Aloes, Cape, Powdered.—The 2 lots examined assayed 66.7% and 71.3% water-soluble matters, 3.3 and 3.4% ash, and 5.9% and 6.9% moisture, respectively: both were within the U. S. P. requirements of 50% water-soluble matter, 4% ash and 10% moisture.

Ammon. Hypophos. N. F. V.—Was a mass of loose, sticky crystals assaying only 90.6% absolute salt, due to excess water, the N. F. requiring 97.5% absolute salt. Was N. F. in other respects.

Antimony, Sulphurated, N. F. IV.—Assayed 54.7% Sb. (N. F. requires 45%); gave heavy precipitate in test for sulphates; strong turbidity in test for Calcium; gave 12% insoluble matter (N. F. requires 4%); gave 1.3% ash from insoluble matter (N. F. requires 0.2%). It was otherwise N. F. A lot marked "Antimony Sulphide, Golden, Antimonic," contained sulphate, assayed 46.6% metallic antimony, 28.2% insoluble matter and was otherwise N. F. IV. Another lot of "N. F. IV" material gave slight precipitate in test for calcium, a heavy precipitate in test for sulphate; aqueous extract acid instead of neutral; 3.7% insoluble in hydrochloric and tartaric acids; unweighable ash from insoluble matter from hydrochloric and tartaric acid treatment; assayed 68.44% antimony; answered other N. F. IV tests.

Asafœtida, Powdered.—U. S. P. requires 50% alcohol-soluble extract and not more than 15% acid-insoluble ash. In the following list of assays on various lots the first figure refers to percentage of alcohol-soluble extract, and the second, where given, refers to acid-insoluble ash: 53.8; 56.6—11.2, 54.2—26.8; 51.0—18.1; 56.6; 59.5—11.3; 52.6—3.0; 39.2—3.4; 35.2; 43.3—6.4; 58.8—14.3; 48.8—7.2; 54.5—13.2; 54.1; 58.0; 49.0; 62.4; 54.1 and 58.0. In general, all other U. S. P. tests were complied with.

Belladonna Leaves.—Lots of powdered "herb" yielded 0.386, 0.365, 0.365, 0.565, 0.53 and 0.555% alkaloids. Lots of "granulated" "herb" yielded 0.506; 0.52; 0.565 and 0.52% alkaloids.

Blaud's Mass, Powder.—Varies according to source of supply in strength and color. Various lots yielded the following, in grams of $FeCO_3$ on the basis of 5 grains of the powder: 0.0898; 0.0831; 0.0812; 0.091; 0.078; 0.094; 0.0615; 0.0812; 0.0619; 0.0910; 0.15. Colors noted in various lots were yellow, buff, dark sage-green and dark umber.

Blood Root.—Three lots assayed: 2.68%, 5.20% and 3.07%, respectively, of total alkaloids. Arbitrary standard: 2.5%.

Blue Cohosh Root.—Two lots assayed 27.45% and 14.8%, respectively, of acid-insoluble ash; whereas the N. F. permits only 6%.

"Borax, Powd., not U. S. P., 99½% Pure."—This is a specimen of accurate labelling. It answered all U. S. P. tests with the exception of a suggestion of discoloration in the test for heavy metals in acid solution but no turbidity or precipitate when the sample was trebled. It also showed a practically negligible excess of arsenic. Another sample of powdered borax assayed 59.07% anhydrous salt (U. S. P. required 52.32–54.92%).

Boric Acid, Powdered.—Three lots marked "99.5–100%" gave decided but quantitatively negligible turbidities in U. S. P. test for "insoluble matter." The separated insoluble matter gave a weak calcium reaction and a strong sulphate reaction. These 3 lots were otherwise U. S. P.

Broom Tops.—Great difficulty has been experienced in obtaining N. F. quality in respect to color (green), taste (bitter); ether-soluble alkaloidal content has also been low. Various lots gave following results: "N. F. Powdered" was grayish brown, bitterish and assayed only 0.117% alkaloids; brown, and not bitter; brown, hardly bitter, assayed only 0.066%; greenish, very bitter, 0.63%; brown, scarcely bitter, 0.09%; green, very bitter; greenish, bitter, 0.3%; dark green, very bitter, 0.77%. In former years it was not difficult to obtain alkaloid content of 0.67–1.2%.

Caffeine.—Shows a tendency toward low water content. Various lots have shown 4, 6, 6, 5.8, 5.5, 6 and 3% water. U. S. P. requires not more than 9%. All lots were otherwise U. S. P.

Calabar Beans.—One lot of powdered drug assayed 0.22% ether-soluble alkaloids. Another lot assayed only 0.105%. Arbitrary standard: 0.15%.

Calcium Bromide.—Two lots of "U. S. P." salt gave brown color in test for bromate.

Calcium Lactate, Powdered.—Most lots of "U. S. P." quality give distinct odor in test for volatile fatty acids.

Calcium Sulphocarbolate.—A lot of powdered salt showed 5 molecules of water ("U. S. Dispensatory" gives 1 molecule).

Camphor.—Two lots marked "U. S. P. except melting point" were strictly U. S. P., even to M. P.

Catechu, Gum.—Two lots assayed 39.5% and 73.0% alcohol-soluble, extractive and answered all other U. S. P. requirements for Gambir (U. S. P. requires 60% alcohol-soluble extractive).

Cerium Oxalate.—Two lots were overstrength due to loss of water, assaying equivalent of 108.4 and 110.4%, respectively, of salt with 10 molecules of water.

Cinchona, Red.—The one lot examined assayed 6.2% total alkaloids (U. S. P. requires 5%).

"Cinchonidine Sulphate, U. S. P."—Contained 14.8% water whereas the U. S. P. allows only 12%. The paper liner of the container was damp and the salt damp and compact.

Colchicum Corm.—Three lots of "granulated, U. S. P." yielded 0.36%, 0.40% and 0.35%, respectively, of colchicine. One lot of "Powdered U. S. P." assayed 0.51%. All samples within the U. S. P. standard of 0.35%.

Colchicine.—Two lots gave test for chloroform but since the loss in weight at 110° C. was only 1.5 and 2.4% in the respective lots the amount of chloroform was negligible. All other U. S. P. tests were complied with.

Cubeb Berries.—Two lots showed 17.1 and 13.8%, respectively, of volatile ether-soluble extractive (U. S. P. standard is 10%).

Culver's Root.—One lot yielded 28.1% acid-insoluble ash whereas the N. F. permits only 6%.

Euphorbia.—One lot of "Granulated, N. F." showed 15.0% acid-insoluble ash; the N. F. limit being 3%.

Ferrous Bromide.—One lot assayed 78.0% absolute salt. This is equal to 91.0% with 2 molecules water or 117.0% with 6 molecules. "P. W. R. Manual" gives ferrous bromide content of 85.69% and states it is a reddish powder. The U. S. Dispensatory gives "yellowish" as color. This lot was a reddish powder. Two other lots from the same source assayed 100.4 and 96.3%, respectively, calculated with 2 molecules of water.

Ferrous Sulphate, Dried, U. S. P.—The numerous lots examined ranged between 84.8 and 89.0 anhydrous salt, all above the required 80%.

Fringe Tree Bark.—Seven lots of "granulated, N. F." yielded 47.2, 39.0, 46.2, 38.8, 47.2, 41.5 and 48.9%, respectively, of extractive soluble in 70% alcohol; all above the required 25%.

Gamboge, Powdered.—The 2 lots examined yielded 85.4 and 87.8%, respectively, of alcohol-soluble extractive; both above the required 65% (U. S. P.).

Gentian Root.—Two lots of "granulated U. S. P." yielded 36.4 and 44.4%, respectively, of water-soluble extractive; the U. S. P. requiring 30%. One lot was low, namely, 27.2%.

Jamaica Ginger.—Three lots of "powdered, U. S. P." yielded 5.4, 6.4 and 6.8%, respectively, of non-volatile, ether-soluble extractive; the U. S. P. standard being not below 2%.

Gold Tribromide.—One lot contained considerable gold in metallic condition.

Guaiac.—"Powdered" lot assayed 25.1% alcohol-insoluble matters: "Powdered N. F." lot assayed 27.15% alcohol-insoluble matter; lot marked "Powdered, 19.9% alcohol-insoluble" assayed 27.3% alcohol-insoluble matter; two lots marked "Powdered" yielded 27.8% and 23.0%, respectively, of alcohol-insoluble matter; the N. F. permitting only 15%.

Henbane.—Eight lots of granulated drug assayed 0.099, 0.071, 0.102, 0.104, 0.0658, 0.0937, 0.0995 and 0.078%, respectively, of alkaloids. Three lots of powdered drug assayed 0.105, 0.130 and 0.121% alkaloids, respectively. The U. S. P. requires at least 0.06%.

Hydrastis.—Six lots of "U. S. P. Granulated" drug assayed 2.69, 3.12, 2.76, 2.82, 2.56 and 2.12% ether-soluble alkaloids. The U. S. P. requires 2.5%.

Hypophosphorous Acid.—Always shows presence of calcium. Average of several lots was 1.42% calculated as calcium hypophosphite. A limit should be established, or at least the presence of calcium declared as a guard against incompatibility in pharmaceutical work.

Ignatia.—A lot of granulated drug assayed 2.70% total alkaloids, above the N. F. requirements of 2%.

Ipecac.—Eight lots of "U. S. P. Granulated" drug assayed 1.99, 2.07, 2.10, 2.15, 2.02, 1.987, 2.37, 2.29% ether-soluble alkaloids. Six lots of powdered "U. S. P." drug assayed 2.01, 2.33, 2.29, 2.465, 2.59 and 2.48%, respectively. The U. S. P. requires 1.75%.

"Iron Arsenated."—Five lots from various sources contained 25.4 and 43.3%; 25.7% and 24.9%; 30.06% and 46.3%; 26.4% and 50.1% and 27.3% and 48.9%, respectively, of total iron and arsenic oxide. "P. W. R. Manual" gives "about 30% Fe and about 40% Arsenic Oxide" for this product.

Iron, Reduced.—All lots have been satisfactory in iron and sulphide content. One lot, as stated on the label, contained excessive sulphide. This product shows great improvement in sulphide content.

Iron Iodide.—Three lots consisted of dry hard lumps and assayed 83.1%, 81.5% and 80.9% of absolute ferrous iodide, respectively, conforming with 4 molecules of water of crystallization which calculates to 81.13% absolute salt. One lot consisting of 2 glass-stoppered bottles was in a soft mass and assayed only 37.3% and 43.9% absolute salt, respectively. Since the stoppers had been dipped in sealing wax it is evident that this low-strength material had been in this condition previous to sealing. Another lot was in the form of soft, damp lumps and assayed only 73.1%.

Iron Glycerophosphate, N. F. V.—Was not soluble in 2 parts of water and contained considerable phosphate.

Iron Pyrophosphate.—Two lots of "Soluble Scales" contained 13.7 and 13.1% total iron, the N. F. requiring not less than 10%. Both contained excess of phosphate, but were otherwise N. F.

Jalap.—Two lots of "U. S. P. Powdered" drug contained 8.3 and 9.55%, respectively, of total resins, well within the U. S. P. requirement of 7%.

Lead Acetate.—One lot of "U. S. P. X Powdered" was slightly over strength due to loss of water of crystallization. It contained 91.54% anhydrous salt, whereas the U. S. P. limits are 85.31 to 89.57%. It was otherwise U. S. P.

Lithium Salicylate.—One lot gave a slightly acid solution when completely dissolved, but when added to water containing a few drops of Phenophthalein T. S. the yet undissolved particles were colored pink, evidently indicating that complete combination of the lithium base used in making the salt had not been effected before the salt was dried.

Lupulin.—One lot was low in ether-soluble extractive, assaying 57.5%, whereas the N. F. requires 60%.

Lycopodium, U. S. P.—Gave strong reaction for starch although the proportion was negligible. It was otherwise U. S. P.

Magnesium Oxide.—A lot of "Heavy U. S. P." was pinkish in color due to excessive iron; otherwise U. S. P.

Manganese Chloride, Crystals.—Assayed 99.0% $MnCl_2$ plus 4 molecules of water.

Manganese Peptonate.—Assayed 3.35% metallic manganese. "P. W. R. Manual" specifies 3% for this type of product.

Manganese Sulphate, Crystals.—Gave 0.01 Gm. of residue in test for other salts and alkalies, whereas the N. F. IV allows only 0.005 Gm. It was otherwise N. F. IV.

Mercury Oxide, Yellow, Wet Process, U. S. P.—Was alkaline to litmus but the blue litmus became neutral upon dipping into water. The oxide was not alkaline to phenolphthalein when 1 Gm. was boiled with 5 cc. of water; but was alkaline to methyl red, and in the latter case was rendered acid by 1 drop of tenth-normal sulphuric acid per Gm. of oxide. Evidently the degree of alkalinity was negligible. The oxide assayed 99.8% and was otherwise U. S. P.

Nickel Bromide.—Assayed 102.9% calculated with 3 molecules of water as suggested by "P. W. R. Manual."

Nutmeg.—One lot of powdered drug yielded 40.6% non-volatile ether-soluble extractive, The U. S. P. required 25%.

Nux Vomica.—Two lots of powdered drug assayed 2.52 and 2.49%, respectively, of total alkaloids. Two lots of ground drug assayed 2.54 and 2.76%, respectively, of total alkaloids.

Oleoresin Capsicum.—Formerly was supplied brown in color. Market offerings are now usually brilliantly red in color making it imperative to re-process it before it can be used in established pharmaceuticals.

Peppermint Leaves.—One lot yielded 6.9% acid-insoluble ash. The official allowance is 2%.

Podophyllum Resin, Powdered.—Is generally satisfactory. Various lots have yielded the following percentages for chloroform-soluble and for ether-soluble: 62.2 and 77.9; 66.8 and 61.7; 65.6 and 80.6; 68.5 and 73.8; 66.1 and 63.6; 75.7 and 83.9; 62.8 and 78.7; 63.2 and 84.6; 61.8 and 79.8; 64.6 and 84.3; 64.2 and 73.6; 64.4 and 75.4; 63.8 and 76.3; 61.8 and 79.8; 64.6 and 84.3; 64.2 and 73.6; 64.4 and 75.4. The U. S. P. requires 65% and 75%, respectively. Ordinarily, a product of light color and low density more closely conforms to the U. S. P. These lots were otherwise U. S. P. in quality.

Potassium Bromide, Gran. U. S. P.—Assayed practically 100% and was free from Bromate and answered all U. S. P. requirements. After storage in a compressed paper drum for 6 months it developed a reddish brown tint throughout its interior portions evidently due to the liberation of free bromine.

Quinine Arsenate.—Varies greatly in composition. Five lots gave following figures for anhydrous quinine alkaloid and total metallic arsenic: 79.3 and 8.9; 79.8 and 9.45; 75.6 and 12.62; 77.2 and 12.06; 78.6 and 11.44. A salt of 8 molecules of water calculates to 69.38% anhydrous alkaloid and 8.02% metallic arsenic.

Quinine Hypophosphite.—Two lots assayed 82.0 and 80.0%, respectively, of anhydrous quinine alkaloid. A lot marked "N. F. Powder" assayed 87.0% anhydrous alkaloid. Two molecules of water calculates to 76.0% anhydrous alkaloid.

Quinine Sulphate.—A lot received in a tinned iron container showed the inner surface of the lid covered with droplets of moisture. This was not due to excessive water in the salt as it assayed only 12.1% water whereas the U. S. P. permits 16.2%. It was concluded that the package had been subjected to excessive heat.

Red Gum, Powdered, True.—Yielded 83.4% cold water-soluble extractive and 1.3% ash. This was a good material. In former years the residue left after exhaustion with water which still resembles good Red Gum in appearance was occasionally offered.

Rhubarb.—Fifteen lots of granulated drug yielded 42.4, 46.1, 38.0, 56.0, 43.1, 42.2, 44.8, 42.2, 34.4, 50.2, 42.4, 47.8, 44.3, 45.6 and 47.1%, respectively, of diluted alcohol-soluble extractive. One lot of powdered drug yielded 43.8%. The U. S. P. required at least 30%.

Senega.—Three lots of "U. S. P." powdered drug yielded 7.9, 9.2 and 3.4%, respectively, of acid-insoluble ash. A lot of ground "U. S. P." drug yielded 3.7% acid-insoluble ash. The official allowance is 2%.

Sodium Bromide, U. S. P. X.—Assayed only 87.8% and gave bromate reaction. It was otherwise U. S. P. This salt was from a German source.

Sodium Citrate, U. S. P. 8th, Gran.—Was U. S. P. 8th in quality and iron content was well within the U. S. P. 8th allowance (U. S. P. time limit test for iron showed positive after $1^1/_2$ hours but not after $^1/_2$ hour). However, this salt developed a faint pinkish tint after 3 months' storage in a pasteboard container so that it would seem that even a smaller proportion of iron than permited by the U. S. P. 8th may cause discoloration if this salt is not preserved in well-closed containers.

Sodium Hypophosphite.—Two lots were high in strength, namely, 110.4 and 107.6% crystallized salt, respectively, due to efflorescence. They were otherwise N. F.

Sodium Nitrite.—Is almost invariably above U. S. P. requirements of 95%. However, one lot was quite damp and assayed only 92.6%.

Sodium Phosphate, Dried.—Moisture content of numerous lots ran from practically anhydrous to 1 or 2% of water. Three lots contained excessive water, namely, 7.2, 11.1 and 8.1%, respectively.

Sodium Succinate.—6 molecules of water calculates to 59.98% anhydrous salt. The various lots of crystallized salt examined contained 57.58, 57.38, 57.7, 60.3, 59.7, 58.2 and 57.6% anhydrous salt. The powdered salt varies greatly, the various lots which were examined showed 58.0, 56.6, 70.9, 61.4, 58.4 and 57.3% anhydrous salt.

Squill.—One lot of ground drug showed numerous shining, transparent platelets of natural gypsum. However, the proportion present was less than 1% so that the strength was not materially affected.

Strontium Bromide, "Dried," Powdered.—Although invariably labelled "Dried" the materials were really only partially dried. Fully crystallized salt calculates to 69.6% anhydrous salt. The various lots examined contained 75.4, 76.5, 80.7, 85.4, 84.3, 77.1, 78.0, 76.6, 79.1 and 77.7% anhydrous salt. One lot labelled as "Dried" actually contained 99.7% crystallized salt (6 molecules water).

Strontium Peroxide.—One lot contained only 66.0% of Strontium Peroxide. The "N. N. R. 1924" required 84%.

Strontium Salicylate, U. S. P.—Is usually quite acid due to excess salicylic acid. One lot had acidity to phenolphthalein corresponding to 0.73% free salicylic acid.

Strychnine Arsenate.—Varies widely in composition. The 4 lots examined showed anhydrous strychnine alkaloid and total metallic arsenic as follows: 66.8 and 15.5; 70.5 and 21.62; 67.0 and 15.88 and 73.0 and 17.4%, respectively. A salt with 2 molecules of water calculates to 65.25% anhydrous Strychnine alkaloid and 14.64% total metallic arsenic.

Strychnine Hypophosphite.—Three lots examined assayed 73.3, 79.5 and 79.5%, respectively, of anhydrous Strychnine alkaloid. "P. W. R. Manual" gives 76.6% for 2 molecules of water.

Strychnine Phosphate.—Assayed 75.0% anhydrous Strychnine alkaloid and so conformed with 2 molecules of water which calculates to 71.37%.

Valerian, Powdered.—Two lots contained 20.8% and 16.2%, respectively, of acid-insoluble ash, and so failed to conform with the U. S. P. requirement of not more than 10%.

Zinc Bromide.—The three lots examined assayed 99.8, 97.5 and 98.3% anhydrous salt, respectively.

Zinc Oxide.—A lot of "U. S. P. Powdered" gave a bluish ferrocyanide test and so contained iron in excess of U. S. P. allowance but excess must have been small as the alkaline sulphide precipitate was white. This lot assayed 99.8% oxide, without igniting sample and was otherwise U. S. P.

Zinc Phosphide.—While in former years it was possible to obtain this material with phosphorus content around 22%, the various lots examined were much lower, *viz.:* 11.17, 11.1, 14.4, 13.9, 12.9, 13.8, 11.74 and 13.03%, respectively. "Mercks 1907 Index" gives Zn_3P_2 as formula. "P. W. R. Manual" gives 24.04% Phosphorus and "U. S. Dispensatory," 21st edition states "Theoretically each grain—contains nearly $^1/_4$ grain of Phosphorus."

Zinc Sulphocarbolate.—One lot was a solid lump the shape of container but excess moisture was not found as an assay of 99.3% salt with 8 molecules of water was obtained.

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EGYPTIAN PHARMACY.

The Indian and Eastern Druggist speaks of Egypt as a cosmopolitan country and it follows that in the larger cities such as Cairo, Alexandria and Port Said, there are English, French, Italian and Greek pharmacists, besides Egyptian, Syrian and Arabic.

A certificate to practice pharmacy in Egypt is granted if the diploma of the applicant is accepted by the Minister of the Interior. A pharmacist must be a graduate of a recognized school of pharmacy and also be prepared to pass a government examination as a test of proficiency. There are two certificates granted, one that of the "pharmacist," and the other "assistant pharmacist." The requirements for the "assistant pharmacist" are not so different from those in this country. The pharmacist does a great deal of chemical and bacteriological analysis and is in close coöperation with the medical profession. There seems to be a mutual regard by the members of the professions.

The Indian and Eastern Druggist also points out that there is considerable traffic in narcotic drugs. While in most instances this traffic is carried on by others than pharmacists there are a few who lend themselves to such business. The Narcotic law is quite stringent, but it seems to be a very difficult matter to make it effective. Quite recently trading in narcotics has been investigated.