on incomes of three or four hundred dollars a year it is a matter of serious importance to secure the best nutrition at the smallest cost. Yet it is rarely, if ever, that a judicious selection of food materials receives attention. It is usually a question of individual taste so far as the means at hand will permit, with a complete ignorance of any principles of economy or health. In these directions and others of no less importance there are great opportunities in the domain of sanitary chemistry to render inestimable benefits to humanity.

What has been said of sanitary chemistry applies with equal force to medical chemistry, to agricultural chemistry, and to other special fields. But I feel sure that the details of the methods of instruction, as well as a consideration of methods based on other recent discoveries, such as the use of models in teaching structural chemistry, can best form a part of the general discussion by teachers who are especially occupied in those particular fields. Perhaps, also, the great border land between chemistry and physics, or chemical physics, should receive attention from those whose investigations are extending our conceptions of the fundamental principles of chemistry.

If I have presented this subject more especially from the standpoint of the preparation for professional occupation, it is because this seems to be the principal demand for instruction in chemistry beyond the elementary branches. But if the value of training in chemistry as a factor in liberal education has not been set forth with due prominence, it should receive just consideration in the discussion which follows. I have not attempted in this paper to include methods or conditions outside of our own institutions. Yet we can not fail to derive great benefit in extending our knowledge of the methods in other institutions through the eminent professors with whom it is our good fortune to meet.

PATENTS OF INTEREST TO CHEMISTS.

EDITED BY ALBERT H. WELLES.

Ore Separators, Etc.—503,454, August 15, Dilworth, R., ore separator. 503,687, August 22, Seymour, C. E., ore concentrator. 503,034, August 8, Brierly, C. B., ore amalgamator. 503,504, August 15, Straker, S., pulverizing apparatus. 503,765, August 22, Johnson, J. S., amalgamator.

502,663, August 1, Eldridge, G. M., washer and concentrator. 503,023, August 8, Willsie, C. F., separator. 504,240, August 29, Patterson, G. H., dry mineral separator. 504,200-201, August 29, Conklin, G., magnetic concentrator. 503,839, August 22, Fauvel, C. J., method for refractory ores; the falling stream of finely divided ore is oxidized and desulphurized by the action of pure hot air and steam passing in the opposite direction, the incandescent particles of ore then being suddenly quenched in cold water. 502,431, August 1, Eames, H. H., desulphurizing metallic ores; the ores are mixed with carbon and lime, heated in a closed vessel, and subjected to the action of the electric current.

Gold and Silver.—502,902, August 8, Evans, G. R., amalgamation of precious metals; a composition of soda, lime, and an oleaginous substance is added to the pulp and mercury in the pans. 504,109, August 29, Macay, J. F. N., extraction of silver from ores; treat ores with cupric chloride, eighty-six parts, and sodium chloride, 424 parts, to one part native silver or silver sulphide. 503,358, August 15, St. Cyr, T. Z. H., composition of matter for coating with silver, containing silver cyanide, potassium cyanide, and water, a solution containing from $\frac{3}{1000}$ to $\frac{1}{100}$ total weight of silver.

Iron and Steel.—504,282-308, August 29, Shaw, S., a cupola furnace for melting iron. 502,492, August 1, Höfer, H., refining iron; the liquid metal is conducted through a zigzag channel and reducing gases are passed through the channel in the opposite direction. 502,482, August 1, Dauber, A., process of making iron; ore and flux without carbon are charged into the furnace, a gas containing oxygen is introduced at the zone of preparation, carbon, super-heated steam, and hot air are introduced at the zone of carburization, carbon, super-heated steam, air, and a heated combustible gas at the zone of melting, and into the crucible containing molten metal, a mixture of gas, super-heated steam, and air. 503,423, August 15, Kidwell, J. W., glazed iron; due to titanium. 503,816, August 22, Walrand, C., and Legenisel, E., process of manufacturing steel.

Zinc.—502,822, August 8, Lewis, G. T., impure zinc oxide is treated with water and a caustic alkali, sulphur salts of zinc are dissolved, and zinc oxide is precipitated.

Tin.—504,238, August 29, Owen, D., apparatus for purifying molten tin.

Aluminum.—503,070, August 8, Broadwell, E. C., coating with the metal. 503,900, August 22, Case, W. E., manufacture of aluminum fluosulphate. 503,901, Aug. 22, Case, W. E., aluminum compound. 503,929, Aug. 22, Hall, J. B., electrolytic method for aluminum; the current is passed through a fused bath of aluminum, sodium, and lithium chlorides.

Acids.—503,847, August 22, Hacker, F. B., and Johnson, A. C., sulphuric acid apparatus. 503,286, August 15, Luhmann, E., carbonic acid manufacture. 503,557, August 15, Solvay, E., apparatus for distillation of hydrochloric acid. 504,264, August 29, Bergmann, F. J., wood-

vinegar manufacture. 502,424, August 1, Precht, H., meta or pyrophosphoric acid combinations are obtained from phosphates of the alkali metals by melting the insoluble salts with a salt of the alkali metals and rapidly cooling to prevent crystallization.

Water.—503,140, August 15, Hoppes, J. J., apparatus for purifying water. 502,408-409, August 1, Thomas, J. E., and Grow, E. P., aerating distilled water.

Brewing and Distilling.—504,074, August 29, Bradley, E., and Dickerson, E. N., increasing yield of alcohol from alcoholic distilled liquors. 504,145, August 29, Zwietusch, O., beer manufacture. 503,168, August 15, Schneider, G. H., brewing beer.

Tanning and Dyeing.—503,235, August 15, Grognet, F., a composition of clay, talc, and barium oxide for preparing hides. 503,987, August 29, Ruemelin, G., tanning; cleaning hide with Glauber's salt, then with a solution of ammonia and grease or oil. 504,012-013-014, August 29, Zahn, W., tawing hides or skins; chrome-alum, zinc sulphate, sodium chloride, potassium sulphide, manganese sulphate are used, and the reduction of chromium acid compounds by arsenite salts is covered by 504,013. 503,148, August 15, Lauch, R., substantive brown dye. 502,912, August 8, Poirrier, A. F., and Rosenstiehl, D. A., black azo dye. 502,765, August 8, Schmidt, R. E., blue alizarin dye. 502,603, August 1, Bohn, R., green-blue alizarin dye. 503,305, August 15, Bender, F., orange dye; derived from acridin. 502,368, August 1, Lauch, R., and Krekeler, C., black azo dye. 502,369, August 1, same patentees, reddish blue azo dye. 503,237, August 15, Heftler, M., and Benard, G., apparatus for extracting dyes, tanning liquors, etc., from stock containing them.

Organic Compounds.—502,504, August 1, Thoms, H., para-phenetol carbamide. 503,748, August 22, Lederer, L., amido-crotonyl-anilid, $C_{10}H_{10}(NH_2)NO$. 503,295, August 15, Schmidt, R. E., hexaoxyanthraquinone and process for making it. 503,066, August 8, Thoms, H., salicylate of para tolyldimethyl-pyrazolon. 503,743, August 22, Geromont, F., lactyl-paraphenetidid. 503,401-402, August 15, Borgmeyer, C. L., pyroxylin solvent and its compounds; the former is an ethyl alcoholic solution of oil of caraway chaff; the second substitutes oil of clove-buds for the oil of caraway. 502,546, August 1, Borgmeyer, C. L., pyroxylin solution; effected by dissolving pyroxylin in oil of lemon grass. 502,547, August 1, same party, pyroxylin dissolved in amyl alcohol solution of oil of cedar leaf. 502,921, August 8, Borgmeyer, C. L,, pyroxylin solvent; oil of cassia, artificial or synthetical.

Paints and Varnishes.—504,064, August 29, Field, W. D., varnish. 504,211, August 29, Gallinowsky, ship's paint; hydro-magnesite, quicksilver chloride, and metallic oxide are given as the ingredients. 503,424, August 15, Kidwell, J. W., pigment or paint; contains oxide of titanium and asphalt.

Plasters, etc.—503,592, August 22. Flynn, J., composition for plaster;

"sand or marble dust, gypsum, slaked lime, talc, mineral pulp, potassium carbonate and glue absorbed in quick-lime." **503,425**, August 15, Kidwell, J. W., non-corrodible plastic composition for building blocks, titanic materials, and asphalt. **503,336**, August 15, Turnbull, G. A., composition of matter for roofing; contains "gypsum, plaster of Paris, powdered salt and flowers of sulphur."

Miscellaneous.—**503,583-584-585-586-587**, August 22, Dupont, F. G., and P. S., smokeless explosives. **502,416-417**, August 1, Groat, E., apparatus for reducing and softening bituminous rock. **503,028**, August 8, Archbold, G., extracting hydrocarbons from bituminous rock; subjecting rock to sulphurous acid. **503,556-558**, August 15, Solvay, E., treatment of pulverulent materials. **503,451**, August 15, Case, W. E., apparatus for electrolysis of fused salts. **502,360**, August 1, Holland, E. K., regenerative salt furnace. **502,642**, August 1, Tatham, E., illuminating gas; contains pure oxygen and a heavy carbonaceous gas. **503,612**, August 22, Meitzler, G. R., silver cleaning and polishing composition; "whiting, powdered soap bark, oil of sassafras and carmine" are claimed. **504,105**, August 29, Corleis, E., and Reinsch, H., carbon rods for electric arc lamps; carbon impregnated with tungstic acid or a salt of the acid. **504,199**, August 29, Cheever, J. D., preserving fibrous materials; a solution of catechu, potassium bichromate, and creosote are used. **502,867**, August 8, Schüler, L., fire-proofing composition; ammonium phosphate and ammonium sulphate are given. **502,964**, August 8, Habedank, C. F., composition for lithographic transfers; "water, partly neutralized nitric acid, and tannic acid." **503,801**, August 22, Mills, J. E., composition for tempering; "oak ashes, water, tallow, slaked lime, salt, ground horn, and potassium cyanide."

NEW BOOKS.

REACTIONS. A SELECTION OF ORGANIC CHEMICAL PREPARATIONS IMPORTANT TO PHARMACY IN REGARD TO THEIR BEHAVIOR TO COMMONLY USED REAGENTS. BY F. A. FLÜCKIGER, PH.D., M.D. Translated, revised, and enlarged by J. B. Nagelvoort, analytical chemist to the Pharm. Chem. Laboratory of Parke, Davis & Co. Authorized English edition. Detroit, Mich., U. S. A. George A. Davis. 1893. pp. x + 154.

This work aims to give the physical properties and principal reactions of the more important organic chemical preparations used in medicine. The book opens with a numbered list of the reagents most commonly used and their preparation, and then follow 109 pharmaceutical products alphabetically arranged, with from one to ten reactions under each. Rather more than one-half the compounds treated of are alkaloids, among which