freezing mixture when crystals of phenol form. This process in some cases is repeated several times.

Salicylic acid is produced by dissolving phenol in caustic soda, then passing carbon dioxide into the dry salt which is slowly heated up to 180° C. Salicylic acid on being heated breaks up into phenol and CO_2.

Phenolphthalein is formed by heating phenol with phthalic anhydride and sulphuric acid.

Phthalic acid is produced by the oxidiation of napthalene and crystallizes from hot water in large prisms. It is decomposed on distillation into phthalic anhydride and water.

Picric acid is formed when phenol is acted upon by nitric acid.

Napthalene moth balls are produced by distilling crude napthalene with 5 per cent sulphuric acid; the purified napthalene is then formed into balls.

Alpha and Beta napthol are used in preparation of colors; thus, the sodium compound of a dinitronaphthol is known as napthalene yellow.

By the action of concentrated sulphuric acid, napthalene yields two isomeric sulphonic acids of the formula $C_{10}H_7SO_3H$.

Between the temperature of 80° C. and 100° C., the alpha modification is produced, while at 160° C. to 170° C., beta napthalene-mono-sulphonic acid predominates. On diluting the solution with water and saturating it with lead carbonate and filtering from the insoluble lead sulphate and excess of lead carbonate, the lead salts of the two sulphonic acids are obtained in solution. They are then concentrated and crystallized, forming napthalene-sulphonate; when this is fused with caustic potash, a substitution of OH for SO_3 occurs, forming the variety of naphthol corresponding to the sulphonate employed. When this fused mass is dissolved in water and filtered, the solution is treated with hydrochloric acid, when the naphthol is precipitated. There are other ways of obtaining napthol.

Beta napthol refluxed with wood alcohol produces a perfume with the scent of cassia blossoms, and when refluxed with grain alcohol, produces the scent of orange blossoms.

LEGALIZED ADULTERATION OF FOODS AND DRUGS.*

CHARLES M. FORD.

It would be too much to expect that the Federal and state laws for regulating the manufacture and sale of foods and drugs could, in the short period of their existence, have accomplished all that was hoped for, by the champions of so fundamental and far-reaching a reform.

It was not possible, and is not now, to provide in the letter of the law for the detection and punishment of every form of adulteration and misbranding; although in the past five years we have learned how, in several important ways, to amend the Federal Act.

Even when amended in accordance with all the views of wise, vigilant and honest exponents of pure drugs and healthful foods, it would be still general in

* Read before the Denver Branch.

its character, leaving much to interpretation, regulation and administration by those intrusted with its enforcement.

It is not within the range of human possibilities to make the law so broadly specific as to reach every cunning evader or violator. Sufficient latitude and discretion must be allowed the officials charged with its enforcement to cope with those individuals in the community, who would for profit engage in the traffic of adulterated foods and drugs.

In the exercise of this discretion, granted by law to Federal and state officials lies the crux of the pure food and drug situation; and is found in the set of regulations adopted by the United States Department of Agriculture, and the Food and Drug Departments of the various states. These officials are in duty bound to yield as much to the demand of big and little business as the lives and health of the nation will permit; to be generous to one without being unjust to the other.

Courts and other officials are naturally lenient in the enforcement of a law providing punishment for acts hitherto not within the purview of law.

This leniency is observed in the nominal fines imposed by Federal courts for the many flagrant and vicious violations of the Food and Drugs Act, since its enactment. It is a comforting sign, however, to see our high courts so considerate and charitable.

But the leniency shown by the Executive Department of the Government is giving cause for alarm. Congress in its tender regard for the country's business interests, decreed that the Act of June 30, 1906, should not be operative until January 1, 1907. A six months' respite was thus granted the traffickers in adulterated and misbranded foods and drugs.

The Colorado Act of March 7, 1907, was not effective until January, 1908, giving immunity until the latter date, from both Federal and state laws, to those conducting their unlawful operations within the state.

These liberal periods of immunity prove not to have been sufficient for disposing of the quantities on hand of adulterated foods and drugs; in fact, it is well known that the production of such goods was continued and the kind heartedness or cupidity of officers of the law relied upon for procuring further time. That the faith of the business interests was not misplaced is shown in concessions granted for the continued use of foods containing copper and tin salts, sulphur dioxide, sodium benzoate, saccharin, talcum and aniline dyes.

The absurdity of the position of the Department of Agriculture in permitting the use of poisoned foods is seen in fixing the percentage of tin or copper salts, which is legal, and in not fixing the quantity of food which the individual may consume.

The inadequacy of the Federal Act is apparent when by the exercise of discretionary powers such traffic is possible.

Nobody will contend that sulphur dioxide is a safe ingredient of foods in daily use; yet the Government says you may take 155 milligrams with each kilogram of food; but is silent as to the quantity one may consume without suffering disastrous consequences.

The use of saccharin is probably the most vicious form of legalized adulteration, because unlike the other adulterants above named, it is substituted for one

of the chief constituents of food and possesses no nourishing or other useful property. It is employed solely to cheapen the product and deceive and starve the consumer.

This writer erroneously stated in a former issue of the bulletin of the Colorado State Board of Health that "artificial benzoic acid, one of the legalized adulterants of food is made almost exclusively from the urine of horses and other herbivorous animals, and always carries the aroma peculiar to its source." It should read "formerly so made, but now superseded by a benzoic acid obtained by the chlorination of toluene, which though not so pure chemically, as that obtained from urine, is preferred because furnished at about half the price."

All text books treating on this subject and published during the past thirty years give this information, except as to the reason for preference being given to the coal tar synthetic. If there be any person so unsophisticated as to imagine the manufacture of a few tons of benzoic acid from urine to be a chemical curiosity, let him go to the corner drug store and ask to be shown:

National Dispensatory, 1884, 3rd edition, page 35.

National Standard Dispensatory, 1905, 1st edition, page 33.

Remington's Pharmacy, 1887, 3rd edition, page 915.

Druggists' Circular, 1909, Feb. and March, pages 56, 127 and 138.

The value of benzoic acid as an antiseptic obtained convincive proof last June when the writer in conjunction with Dr. Sherman Williams, president of the State Board of Health, while visiting a pickle factory of this city, discovered several barrels of tomato pulp, which it was said had just been received from a cannery in northern Colorado. The heads of the barrels were swelled, the staves sprung, and the working pulp oozed through many forced crevices.

The pulp certainly looked like a total loss, but the addition of benzoate of soda, after boiling in copper kettles, made this decomposing pulp available for ketchup. It is possible that cresol, or some other well-known antiseptic would have been just as effective, but doubtful.

The most prolific source of adulteration in drugs is through the "relabeling" process in vogue in the U. S. custom houses.

When a drug arrives there, no matter how inferior or deteriorated in quality, it is examined by Government experts and its true character revealed. Whereupon it may be released to the consignee subject to a relabeling upon the cask, bale or other container, on which shall be declared the degree of adulteration.

If the contents of such bale or cask pass through a drug mill or are used in compounding or manufacturing, it is obvious what a farce this relabeling is.

In this way do we account for the poor quality of powdered drugs and spices on the market. Also for the resin of guaiac, which appears to be common rosin coated with powdered guaiac resin; a "tearless" benzoin mixed with barks, gravel and other extraneous matter and asafetida possessing none of the attributes of the true gum resin, except a slight peculiar odor.

A feature of the Colorado Food and Drug Law provides that the regulations adopted by the State Board of Health shall not conflict with nor be more stringent than those adopted by the U. S. Department of Agriculture; hence our anxiety and enforced interest in the Federal regulations.