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REPORT OF THE CHEMIST.

UNITED STATES DEPARTMENT OF AGRICULTURE,
BUREAU OF CHEMISTRY,
Washington, D. C., October 13, 1917.

SIR: I submit herewith the report of the work of the Bureau of Chemistry for the fiscal year ended June 30, 1917.

Respectfully,

C. L. ALSBERG, *Chief.*

Hon. D. F. HOUSTON,
Secretary of Agriculture.

The research of the year has yielded some interesting results, such as the discovery of a new sugar, sedoheptose, from *Sedum spectabile*, of a new method for the preparation of phthalic anhydride, of new sugar derivatives, of new facts concerning the proteins of agriculturally important seeds, concerning the arsenates and chlorarsenates of lead, and concerning the explosibility of carbonaceous dusts. Other important results deal with the identification of the volatile reducing substances of vinegar as acetylmethylcarbinol; the improvement of the methods for the separation of lithium from the other alkali metals, and for the identification of lactic and butyric acids in biological products. The results of about 60 investigations have been reported and some 50 others completed. Nine bulletins and two Farmers' Bulletins were published.

More attention has been paid than ever before to the study and demonstration of methods of conserving and preparing foodstuffs by drying, canning, pickling, preserving, and by the use of meritorious substitutes. In consequence, educational and demonstration work has grown very much during the year.

The enforcement of the food and drugs act has undergone no radical changes. The disposition of the foodstuff and drug industries to cooperate with the Bureau of Chemistry continues to grow with a resulting improvement of the quality of their products and the elimination of spoilage and wastes. While the number of cases sent to prosecution is about the same as in former years, the amount of work involved in perfecting a case is becoming steadily greater, a certain indication of a very general improvement in commercial practice. The progress of the past 10 years has been so great that an effort has been made at the end of this report to summarize the effects of the enforcement of the food and drugs act during the first decade since its enactment.

RESEARCH.

Plant chemistry.—Studies upon the effect of fertilizing wheat with nitrates and potash at different states of growth have demonstrated that nitrates applied when the wheat is beginning to head affect the

composition of the wheat but not the yield, while application when the plant is 3 to 4 inches high affects the yield but not the composition of the wheat.

Investigation has shown that the proteins of buckwheat flour contain a high percentage of basic amino acids, an important fact in estimating the value of buckwheat as a substitute for wheat.

The results of the study of some of the proteins of the peanut have been published, and in cooperation with the Bureau of Animal Industry it has been shown that peanut meal is a valuable feed for dairy cows. Farmers' Bulletin 751 on Peanut Oil has been issued jointly with the Bureau of Plant Industry.

The study of kafirin, an alcohol-soluble protein of kafir, has been published. The chemical and physical properties of the different parts of the kafir kernel have been studied. The germ and endosperm closely resemble those of corn. The germ contains oil. The bran, however, differs from that of corn in having a very high ether extract due to the presence of waxy material. These results indicate that it might be possible to obtain by milling kafir, products analogous to the commercial corn products.

Studies upon the occurrence of manganese in *Chrysanthemum cinerariaefolium*, upon the effect of boron on plant growth, upon gingerol, the pungent principle of ginger, and paradol, the pungent principle of grains of paradise, have been completed, and others on the composition of the bark of the *Viburnums*, of coca leaves, of *Pterocarpus* wood and of *Chaulmoogra* seeds are in progress.

A preliminary study of the volatile oil of Chinese mustard, *Brassica juncea*, and Japanese mustard, *Brassica cernua*, indicates that the oils are mixtures containing only in part allylisothiocyanate. The oil of *Brassica campestris annua sativa chinensis*, an adulterant of mustard proved to be crotonylisothiocyanate, an oil without mustard qualities. Since the plant grows very vigorously, it is planned, in cooperation with the Bureau of Plant Industry, to utilize it either for greens and salads or for stock feed. The seeds yield over 40 per cent of fatty oil with the general characteristics of rape oil.

A study of *Piper bredemeyeri*, an adulterant of matico, *Piper angustifolium*, showed that the volatile oil like that of *Piper mandoni* contains dillapiol and is free from asaron obtained from genuine matico and from the camphor obtained from *Piper angustifolium* var. *Ossanum* and *Piper camphoriferum*.

Of the saponins of the yucca and agave species studied, all have been found to yield the same sapogenin when hydrolyzed. Upon hydrolysis the saponins of *Yucca filamentosa*, *Y. glauca* (*Y. angustifolia*), *Agave lecheguilla* and probably *radiosa* yield glucose, while that from *A. lecheguilla* also yields galactose and that from *Y. filamentosa* apparently glucuronic acid. Some of the results have been published.

The studies upon cotton reported last year have been continued and extended to other genera of *Hibisceae*, especially to wild cotton, *Thurberia*.

Many common foods of vegetable origin have been examined for oxalic acid.

Cereals—flour.—A bulletin upon the by-products of rice mills is in press. It gives data which should enable chemists to determine

whether rice brans, rice polishes, and similar by-products have been adulterated with hulls. Studies have also been made upon the difference in composition of natural brown and of polished rice. The pearling of barley and the use of barley as food have been investigated. The studies upon the determination of grades of flour, upon the effect of granulation upon the baking quality of flour and upon wheat substitutes in the baking of bread have been continued. It has been found possible to make good flour and bread from einkorn, emmer, spelt, and Polish wheat.

Fruits and vegetables.—The changes in chemical composition that take place in the ripening of California olives, oranges, grape-fruit, and cantaloupes, and of Florida oranges and grapefruit have been investigated. Data upon the composition of sound and frozen lemons have been published. Several varieties of California avocados have been examined to assist growers in choosing the best varieties. Bulletin 452, "The Composition of American Grapes Grown in the Central and Eastern States" has been issued. Studies have been made to correlate the properties of tomato products with the quality of the raw material from which they are made with special reference to the amount of decayed material used in the preparation of such products.

Sirup, sugars.—Revisions of Farmers' Bulletins 477, "Sorghum Sirup Manufacture," and 516, "The Production of Maple Sirup and Sugar," are about to be issued. A chapter on "Jelly and Jelly Making" has been contributed to Farmers' Bulletin 853.

The investigations upon the two new heptose sugars, d-mannoketcheptose from the avocado, and sedoheptose from *Sedun spectabile* have been printed. A number of papers have been published upon the relation between the rotatory power of sugars and sugar derivatives and their chemical constitution. A number of new sugar derivatives have been prepared and made the subject of publications.

Flora of foodstuffs.—The necessity of carefully examining floating grounds for the self purification of polluted oysters during a considerable period of time to guarantee against the existence of occasional sources of serious pollution before the commercial utilization of such grounds should be approved, has been demonstrated. Such grounds are available for each of the oyster-producing areas of the Atlantic seaboard and upon them oysters cleanse themselves more rapidly than has been supposed. Unpolluted shucked oysters, taken from muddy or dirty bottoms, may become polluted in the process of washing unless certain precautions be taken. Satisfactory methods for washing have been determined and the washing apparatus has been improved. Experiments upon the hibernation of oysters indicate that the oysters pass into this condition at a temperature of the water of somewhat above 45° F. Data on the bacteriology of the shell liquor and meats of oysters have been published.

In order to determine whether or not an injustice might be done to a bottler of drinking water through the examination of his product a long time after bottling, the changes that the flora undergoes on storage of the water were investigated. No such injustice can be done since most organisms, including *B. coli*, fall off in number during storage. A few species not regarded as associated with pollution may multiply, especially in waters with a certain mineral content. The presence of a considerable number of molds in bottled waters is clearly indicative of storage.

A paper upon "*Aspergillus fumigatus*, *A. nidulans*, *A. terreus*, 11. sp. and their Allies," has been completed and papers upon the "Bacteriological Study of Hamburger Steak" and upon the *Aspergillus niger* group have been reported. A large collection of saprophytic organisms is maintained in growing condition and cultures from this collection are supplied to laboratories and collaborators seeking such assistance.

Beverages.—Bulletin 493, "Study of American Beers and Ales," has been issued. A study of the presence of arsenic in hops, undertaken in cooperation with the Bureau of Plant Industry, showed that this contamination is due to the presence of arsenic in the sulphur used in curing the hops. United States Patent No. 1216722 has been granted for a carbonating machine and some of the results of the experiments on methods of carbonation of beverages have been published.

Drugs and pharmacology.—Researches on organic periodides of antipyrin, iodantipyrin, and pyramidon have been printed. Investigations upon the pharmacological action of the fat-soluble dyes, of oil of chenopodium, of the iodides, of citrates, and of malates were published. Further work upon the action of dyestuffs, of heavy metals, and of organic acids is in progress.

Insecticides and fungicides.—In cooperation with the Federal Horticultural Board experiments were undertaken to discover methods of fumigating foodstuffs, such as seeds, without rendering them unfit for human consumption. The results of the investigation of the poisoning of bees by sprays will be published by the Bureau of Entomology. A paper has been issued on a new tree-banding material. The work on copper and sulphur fungicides has been continued with special reference to increasing their sticking qualities and reducing the amount of copper necessary. One paper has been published upon lead chlor arsenate and three upon the arsenates of lead. Bulletin 408, "Experiments During 1915 in the Destruction of Fly Larvæ in Horse Manure," was published jointly with the Bureau of Entomology.

Analytical methods.—There have been published methods for the estimation of lactic and butyric acids in biological products, of moisture in bread, of hydrocyanic acid in beans, of total solids in milk, of the folding endurance of paper and of the strength of paper when wet; also methods for the separation of lithium from the other alkali metals; for the separation and identification of food coloring substances and of fat-soluble dyes; for the detection of lime used as a neutralizer in dairy products, and of molds in drugs, foods, and spices; for the identification of emodin-bearing drugs; for the examination of methyl salicylate, and for the analysis of proprietary medicines. The description of an apparatus for the purification of mercury has been printed.

Studies were also made upon the estimation of citral, of monobromated camphor in migrain tablets, of fat in condensed milk and milk powders, of the acidity of cereal products, of added water in milk, of arsenic in sulphur and hops, upon the determination of fluorine in baking powders; also upon the electrolytic determination of lead, upon the identification of volatile oils, upon the separation

of aluminum from iron, upon the Kjeldahl method for determining nitrogen, and upon the analysis of brines.

It has long been the practice of the Bureau of Chemistry to systematically test the purity of all chemical reagents furnished to the Bureau's analysts. During the past two years much difficulty has been experienced in securing chemical reagents of satisfactory purity. This applies not merely to so-called chemically pure reagents but also to those reagents supposedly of high quality, which bear upon the label an analysis purporting to represent the amounts of impurities found in the reagent. In many cases these labels have been found to be directly misleading. For example, peroxide of lead which, according to the label, was supposed to contain only a trace of nitrates, actually contained from 20 to 30 per cent of lead nitrate. Particular difficulty has been encountered in the case of those reagents which are not very soluble, such as barium carbonate. However, during the last few months of the year there was some improvement in the quality of the reagents furnished. Such heavy chemicals as the mineral acids, ammonium hydroxide and similar products have usually been found to be of good quality and complying with the specifications under which they are sold.

CONSERVATION OF FOODSTUFFS.

The fleshing of poultry.—Experiments were conducted to demonstrate that wheat is not necessary or even desirable as a feed to fatten poultry. An economical ration has been found that will cause young chickens to gain over 35 per cent of their initial weight in 14 days.

Fish.—Bulletin 378, "Fish Meal: Its Use as a Stock and Poultry Food," and Bulletin 538, "Shrimp: Handling, Transportation, and Uses," have been published. A paper embodying analytical data on the food value of 20 common food fishes, with special reference to seasonal variation, has been completed. A bulletin on the methods of preserving fish by freezing, from the season when the supply is abundant to the time when it is scanty, has been finished. Work on the wet as compared with the dry chilling and packing of fish has been begun. Preliminary observations indicate that contact with water or melting ice causes the fish to absorb water, to lose soluble protein and to deteriorate in flavor.

Fermentation and pickling.—Work on potato silage for cattle food has been continued in cooperation with the Bureau of Animal Industry. The work on the fermentation of sauerkraut has been continued and extended to the household preservation of corn, beets, and string beans, using vinegar, or soured corn-meal extract as a starter, to prevent initial deleterious fermentation. The substitution of brining for pickling in the preservation of certain vegetables has also been examined.

Drying, starch production.—Progress has been made in the improvement of the methods of drying apricots and peaches. The work on the utilization of potatoes by drying and by the manufacture of starch has advanced to such a stage that these processes will soon be conducted on a commercial scale large enough to determine the question of costs. The preparation of sweet-potato flour and the

drying of a considerable number of vegetables has also been investigated.

Citrus fruits.—The production of citric acid on a commercial scale from cull lemons has been solved and citric acid has been sold at a price several cents above the market. The preparation of lemon oil has not yet been perfected. Orange pulp for the manufacture of marmalade has been prepared and distributed to the trade. Arrangements have been completed for the shipment of frozen orange pulp. Methods for preparing citrus peel for the market have been developed. An exchange service has been inaugurated by which producers and purchasers of citrus by-products have been brought together.

DEMONSTRATION.

Poultry and eggs.—The railroads are rapidly accepting and incorporating in their refrigerator-car specifications the modifications indicated by the experiments in the transportation of poultry and eggs. About 3,500 cars with heavier insulation, basket bunkers, and floor racks are now out of the shops or nearing completion. Several big systems have decided to modify all their refrigerator equipment as fast as it can be put through the shops.

Over 20 poultry and egg packing houses have been built during the past year on the basis of plans and information furnished by the Bureau of Chemistry. More than 10 egg-breaking rooms have been constructed and equipped according to the Bureau's plans and specifications. There are now hundreds of small, clean poultry packing houses, where, 10 years ago, were sheds, insanitary and filthy. The prime factor in this transformation has been the department's work to improve the handling of perishables. The egg-breaking business of the country has been revolutionized during the past 10 years—a result due to a combination of educational and regulatory work.

The Poultry and Egg Demonstration Car was sent through Tennessee, northern Mississippi, and Alabama and Kentucky. Forty towns were visited. More than 3,000 people came to the car.

Tomato products.—Bulletin 569, "The Sanitary Control of Tomato-Canning Factories," was issued, and an extensive educational campaign conducted to improve the production of tomato products, with special reference to increasing the manufacture of the more concentrated products, such as pulp and paste, for the purpose of conserving tin plate.

Sirup.—Improved methods of preparing cane sirup that will neither crystallize nor ferment have been demonstrated and are beginning to be adopted. Progress has been made in improving methods of clarifying this sirup.

Oysters.—Many of the oyster packing houses were visited and improved methods of sanitation, washing, and handling oysters were demonstrated.

Naval stores.—Additional sets of permanent rosin types have been prepared and deposited, one with the Chamber of Commerce at Mobile, Ala., one at the Food and Drug Inspection Laboratory, at Chicago, Ill., one at the Food and Drug Inspection Laboratory at San Francisco, Cal., and two sets have been retained at the Leather and Paper Laboratory in Washington as loan sets. All of these sets are

available for the use of interested parties in their respective territories. Two parties are engaged in demonstration work on improved methods of producing naval stores in the turpentine-producing States. The present methods of production are so crude and wasteful that there is much need for this type of work.

ENFORCEMENT OF THE FOOD AND DRUGS ACT.

Domestic foods and drugs.—The enforcement of the Federal Food and Drugs Act constitutes by far the largest part of the work of the Bureau of Chemistry. While the extent of the Bureau's activities in this direction can only be partially indicated in a statistical way, a few statistics may be of value. The records show that 371 recommendations for seizure and 719 recommendations for criminal prosecution were made through the offices of the Solicitor and of the Secretary to the Department of Justice. There were collected 5,649 official and 2,171 informal samples. The number of official samples analyzed by the field force in the laboratories is given in Table I, but this table does not include thousands of examinations made in the field, such as the candling of suspected shipments of eggs or the critical inspection of consignments of wormy or decomposed nuts.

TABLE I.—Report of branch laboratories for year ended June 30, 1917.

Laboratory.	Legal.	Import samples.		Floor inspection samples.	Interstate samples.			Miscellaneous samples.	Total samples analyzed.	Hearings.	
		Il-legal.	Re-leased without prejudice.		Legal.	Il-legal.	Check analysis.			Per-sonal.	By cor-respondence.
Central district:											
Chicago.....	142	237	12	1,903	541	440	186	371	1,929	151	150
Cincinnati.....	110	28	60	187	88	193	36	1,408	1,863	134	440
Minneapolis.....	15	67	10	226	200	109	5	146	552	74	147
New Orleans.....	49	77	4	1,016	53	116	26	152	477	59	147
St. Louis.....	6	2	.....	270	1,171	725	92	435	2,431	155	310
Total.....	322	411	26	3,602	2,053	1,583	345	2,512	7,252	573	1,194
Eastern district:											
Boston.....	234	360	63	9,381	161	167	113	212	1,310	342	237
Buffalo.....	13	21	9	32	121	109	2	252	527	82	80
New York.....	4,574	3,736	497	22,511	192	313	14	160	9,486	901	2,983
Philadelphia.....	196	155	50	1,964	49	112	.....	87	649	254	26
Porto Rico.....	306	350	173	3,107	10	381	.....	102	1,322	491	118
Savannah.....	62	17	3	.....	60	201	1	162	506	47	109
Washington.....	106	88	1	16	447	579	39	541	1,801	139	48
Total.....	5,491	4,727	796	37,011	1,040	1,862	169	1,516	15,601	2,256	3,601
Western district:											
Denver.....	29	3	6	58	96	101	.....	144	379	8	17
Honolulu.....	48	128	10	4,035	20	15	.....	34	255	138	.....
San Francisco.....	462	677	76	18,693	169	165	13	1,054	2,616	730	169
Seattle.....	310	321	47	7,340	92	82	.....	346	1,198	275	57
Total.....	849	1,129	139	30,126	377	363	13	1,578	4,448	1,151	243
Grand total.....	6,662	6,267	961	70,739	3,470	3,808	527	5,606	27,301	3,980	5,038

The Service and Regulatory Announcements published during the year contained 30 opinions and 500 notices of judgment. There were also issued Food Inspection Decision 168, amending paragraph

(e) of Regulation 29, which relates to marking the quantity of the contents of food in package form; and, upon the recommendation of the Joint Committee on Definitions and Standards, Food Inspection Decision 169, "Edible Vegetable Fats and Oils," and "Food Inspection Decision 170, "Sweetened Condensed Milk, Condensed Skimmed Milk, Sweetened Condensed Skimmed Milk, Dried Milk, Dried Skimmed Milk, and Malted Milk."

In the interest of more efficient administration of regulatory matters the headquarters of the Eastern Food and Drug Inspection District were transferred from Washington to the United States Appraiser's Stores in New York City.

One peddler of spurious acetyl salicylic acid was convicted under the Food and Drugs Act. Certain other distributors of spurious neosalvarsan and acetyl salicylic acid were sentenced to prison through joint action of State and municipal officials, the Post Office, and the United States Departments of Justice and Agriculture. In one case a prison sentence was imposed after conviction for conspiracy in connection with adulteration of olive oil.

Special attention was given to shipments of polluted or spoiled food. A number of shipments of decomposed canned goods returned to packers or jobbers for the adjustment of claims were seized, evidence having been secured that the consignees had taken steps to dispose of the seized goods or previous similar consignments for food purposes. This practice of returning goods for the adjustment of claims for spoilage has led to certain abuses, which have been taken up with the industry in the hope that through cooperative action conditions may be controlled more effectively than in the past. Steps were taken to prevent the shipment of decomposed sardines, commonly described as "belly-blown." Inspection was made of the canning of California sardines, of tuna, and of abalone. Of the California fava-bean crop it was necessary this year to seize only a few cars of excessively wormy beans. The canning of decomposed navy beans has been suppressed very largely. The interstate shipment of oysters from polluted waters has practically ceased, and the practice of adulterating oysters and scallops with water has been checked in the main. Cooperation with State and municipal officials to control the shipment of bad eggs has been continued, and it is reported that the quality of the eggs reaching the large cities is much improved.

Cooperation to improve the milk supply has also continued, especially at St. Louis and in New England. The cooperation with local authorities begun last year in Texas to prevent the contamination of springs from which water is shipped in interstate commerce was this year extended to Arkansas, Wisconsin, and Missouri, with satisfactory results. A case in which the fairness of the standard of purity for mineral water proposed by the Bureau was attacked was decided favorably to the Government. Important issues of fact involving the methods of estimating decomposition of tomato products were determined in court.

Action was taken against shipments of worthless frozen oranges and of colored immature oranges and grapefruit, of evaporated apples and canned tomatoes adulterated with water, of mixtures of

cider vinegar with distilled vinegar or dilute acetic acid so manipulated as to simulate genuine cider vinegar, and of glue containing excessive zinc and other metallic impurities sold as edible gelatin.

Much work of an educational nature has been carried on, designed to secure a strict compliance with the requirements of the "net weight" amendment, and a number of prosecutions for violation of the amendment have been brought with success. Work has been in progress on tea, coffee, cocoa, spices, and similar free-flowing materials to establish suitable tolerances in filling packages of this class of products. In this connection a careful study was made of automatic weighing machinery.

With the aid of State feed officials, the inspection of low-protein meal and cake made from delinted cottonseed, reported last year, was repeated and extended to the Pacific coast. This year some of the mills placed fans above the separating screens, thus removing a considerable amount of hulls and linty matter. In many cases the labeling of the meal was changed to correspond with its true composition. Action was also taken against linseed meal adulterated with screenings and oats with weed seeds added to increase the weight per bushel.

Carelessness on the part of druggists of the District of Columbia in compounding even the simpler preparations resulted in prosecutions involving magnesium citrate solution, chloroform liniment, spirits of camphor, and the like. Similar conditions were found to prevail in Porto Rico.

Greater care than is now exercised is needed in the collection and preparation of native crude drugs to exclude earth, trash, and foreign plant matter. Some instances of such bad practice noted were: Pennyroyal containing 20 per cent of sand, unicorn root containing 15 per cent of earth, pipsissiwa "leaves" consisting almost entirely of stems. Accordingly, cooperation with the trade has been established to consider practical working standards for crude drugs not recognized in the United States Pharmacopœia or the National Formulary. Among the substitutions observed may be mentioned the substitution of nonofficial aconites containing no aconitine for aconite: of *Chimaphila maculata* for pipsissiwa (*Chimaphila umbellata*); of false unicorn root (*Chamaelirium luteum*) for true unicorn (*Aletris farinosa*); of *Aspidium aculeatum*, or an *Osmunda* species, probably *Osmunda cinnamomea*, for male fern (*Dryopteris filix-mas* or *Dryopteris marginalis*). The samples of true *Aspidium* collected were old and not up to the requirements of the Pharmacopœia.

Cooperation with State and Municipal Officials.—On August 5, 1916, the Association of American Dairy, Food, and Drug Officials adopted the following resolution: "That both State and Federal food and drug officials of this Association unite in the formation of smaller associations on a basis of community interests to study ways and means of handling local problems, and that their conferences be entirely of an executive nature." In consequence, associations have been formed by the officials of New England, of the Central Atlantic States, and of the South Central States. Members of the Bureau of Chemistry have taken an active part in the meetings of these associations. Perhaps the most significant development in cooperation of

the year is that active cooperation has been established with city officials. Many specific instances of cooperation are noted elsewhere in this report. A "Clearing House Letter" has been issued frequently to food and drug officials. Its purpose is to furnish officials all available current material bearing upon the enforcement of food and drug laws. A revision of the Manual of Procedure for the Guidance of State Health, Food, and Drug Officials was published in October, 1916. A compilation of the definitions and standards for foods and drugs that have been enacted into law by the several States was prepared and distributed to many officials. Concrete evidence of the spirit of cooperation now prevailing is found in the greater use by State officials of the Food and Drugs Act as an additional protection to their people. During the year there were instituted by 14 States, 117 such cases—25 seizures and 92 criminal prosecutions. These do not include cases instituted by the District of Columbia. Nearly all of these cases involved feeds. Only nine involved foods. There were no drug cases. The preponderance of feed cases will not be so great next year since during the present year there were collected by 24 States 330 official samples—232 feeding stuffs, 91 foods, and 7 drugs.

Imported foods and drugs.—Statistics concerning the import work are given in Table I. The quantity of imports has been greatly reduced. Regular brands and lines of products no longer form the bulk of the importations, and even standard articles, such as belladonna, have almost entirely disappeared. On the other hand, new products obtained from countries that have not heretofore shipped to the United States and new varieties of the old from new sources have been offered. Thus imitations of such Italian cheeses as Romano, Reggiano, and Parmesan have been imported from South America. The long trip through the tropics in ships not equipped with refrigeration not infrequently spoils them. The high price of beans has caused the extensive importation of many varieties of beans from many countries. Among them were so-called Burma or Rangoon beans from Asia and tapiramos beans from South America, which are known to yield hydrocyanic acid under some conditions. Shipments yielding appreciable amounts of hydrocyanic acid were therefore excluded as being dangerous to health. These poisonous beans are varieties of lima beans (*Phaseolus lunatus*) of various colors and in shape may not be unlike the common navy bean. On careful inspection they may be distinguished from the common bean by the fact that, unlike the common bean, they show distinct striations radiating from the eye to the periphery. There are also other less easily noticeable differences. The quality of the tomato paste imported has improved. Except for a few shipments of English mustard, European, including Russian, mustard seeds have entirely disappeared from the importations, and have been replaced by Chinese, Japanese, and Indian seeds. Indian rape or Tori (*Brassica napus* Var. *dichotoma*) was substituted for Indian brown mustard. Chinese mustard (*Brassica juncea*) seems often to be improperly collected, since it frequently contains much immature seed and weed seeds with *ErUCA*. The use of genuine material from new botanical sources has been encouraged when properly collected and imported

under appropriate designations. Among the importations of this type which have been noted are chamomile flowers and valerian root from Japan, as well as of *Hyoscyamus muticus* for the manufacture of the alkaloid hyoscyamine. So-called Bombay or Indian coriander has almost entirely replaced the ordinary article. This coriander appears to be of the official species, but contains somewhat less volatile oil than the European variety, and several shipments have been detained for this reason. Among the drug adulterations that have been noted may be mentioned the substitution of *Inula britannica* for arnica flowers (*Arnica montana*); *Solanum nigrum* for belladonna (*Atropa belladonna*); *Xanthium strumarium* for stramonium (*Datura stramonium*); *Lippia berlanderi* and *Origanum vulgare* for marjoram (*Majorana hortensis*); *Cassia angustifolia*, *Ipecacuanha fibrosa*, and *Ionidium* species for ipecac (*Cephaelis ipecacuanha*); *Ballota hirsuta* for horehound (*Marrubium vulgare*); *Foeniculum piperitum* for fennel (*Foeniculum vulgare*); *Rheum rhaponticum* for rhubarb (*Rheum officinale*). As much as 20 per cent of the toxic plant *Tephrosia apollinea* was found in a shipment of Tinnelly senna (*Cassia angustifolia*). A fungus growth closely resembling the sclerotium known as "ergot" was found in caraway (*Carum carvi*) and in cumin (*Cuminum cuminum*).

From time to time it has been suggested by importers that the Bureau issue announcements of the action taken on detained shipments of foods and drugs in a manner similar to those now required to be issued by law as notices of judgment concerning the outcome of prosecutions under the domestic sections of the law. This matter was discussed at a hearing. It became apparent in the course of the hearing that the information to be of value should be specific and descriptive and that the issuance of such information could not be effected without identifying either directly or by implication the importers concerned. For this reason and for the further reason that these detentions are not a matter of court record, it was decided that since the importers have no opportunity ordinarily for investigating the character of the goods before arrival, the reflection which such publications would make would not be warranted and the Bureau would not publish a list of special detentions.

COLLABORATION.

Collaboration with the Post Office Department led to some notable results during the year. Through the assistance given by the Drug Division a considerable number of fraud orders were issued. Members of the Drug Division also assisted the officials of the Post Office Department in the trial of a number of cases. In the case of a drug fraud a fine of \$30,000 was imposed. This case has paved the way for prosecuting this collaborative work more vigorously against products which are subject to the postal laws rather than to the Food and Drugs act. All in all 81 samples of medicines and drugs sent through the mails have been analyzed for the Post Office Department.

The laboratories in Washington analyzed during the year 4,190 samples for other bureaus of the Department of Agriculture; for other executive departments and government establishments, 681 samples were analyzed, as shown in Table II. This total does not

include samples which were analyzed by the branch laboratories of this Bureau. These are included among the miscellaneous samples given in Table I.

TABLE II.—*Miscellaneous analyses for other branches of the Government.*

Department of State.....	2
Department of the Treasury.....	2
Department of War.....	32
Department of Justice.....	2
Post Office Department.....	2
Department of the Navy.....	83
Department of the Interior.....	3
Department of Commerce.....	9
Government Printing Office.....	3
The Panama Canal.....	23
District of Columbia.....	16
Federal Trade Commission.....	3
Miscellaneous.....	501
Total.....	681

TEN YEARS OF THE FOOD AND DRUGS ACT.

The first 10 years of the enforcement of the Food and Drugs Act of June 30, 1906, ended January 1, 1917. It is therefore fitting at this time to present a brief history of the act, and the work accomplished under its authority during the decade.

It is perhaps impossible for any one correctly to estimate the general effect of the Food and Drugs Act. To state that more than six thousand cases have been terminated in the courts during the first decade since the enactment of the act; that manufacturers have been cited to hearing more than forty thousand times, that many thousands of factory inspections have been made, that more than seven hundred and fifty thousand shipments of food and drugs, both domestic and imported, have been examined, gives but an imperfect indication of results. The accomplishments under the Food and Drugs Act can be proven only in part by reference to the files of the bureau. It is technically and of necessity a penal statute, but in fact and in intent it is corrective legislation, and a measure of the corrective influence of the act is the true measure of accomplishment. Perhaps such an estimate can best be gained, though imperfectly, by considering the effect of the act upon food and drug control by the States, upon the development of the food and drug industries, and by the enumeration of some of the principal abuses that have been corrected.

One of the consequences of the enactment of the Food and Drugs Act was to stimulate the enactment of similar legislation in many of the states, in order to control the local traffic in foods and drugs which, since no interstate commerce is involved, is not subject to the Federal Act. For example, in 1906 a considerable number of states had feeding-stuffs laws, but many had none. A state could not prosecute a manufacturer unless he were a citizen of that state. The Federal law supplements the state law in this respect, and now most of the states have similar laws. Naturally, in the beginning much confusion and apparent conflict between the local and Federal laws and the local and Federal administration of laws seemed to exist, so that it was difficult for the two sets of officials to supplement one

another. In consequence it was often necessary for manufacturers to make very special preparation for shipment to certain states at extra cost, which naturally was passed on to the ultimate consumer. This lack of uniformity has been remedied to a considerable degree by two agencies: (1) The Joint Committee on Definitions and Standards, consisting of representatives of the Association of American Dairy Food and Drug Officials, of the Association of Official Agricultural Chemists, and of the Department of Agriculture, and (2) by the Office of Cooperative State and Federal Food and Drug Control, established in the Bureau of Chemistry in 1914. The Joint Committee, which was established by the Secretary of Agriculture, proposes standards and definitions for the consideration of State officials which, after adoption by these officials, are adopted by the Department of Agriculture for the guidance of its officials. In this manner independent and conflicting action by independent groups of officials is, to a large extent, voluntarily obviated. The Bureau of Chemistry's Office of State and Federal Cooperative Food and Drug Control is essentially a state agency in a Federal bureau. It is a special agent for the state or municipal official. It acts as a clearing house for all matters dealing with food and drug control so that all the officials of the country may be kept informed upon all that is in progress throughout the country. It furnishes regularly information and assistance to State and municipal officials. The result is that Federal, State and municipal officials are able to supplement each other more effectively than was possible early in the law's enforcement. This is well exemplified by the fact that during the fiscal year ending June 30, 1917, one hundred and seventeen cases were instituted under the Federal law by State officials, exclusive of the officials of the District of Columbia, and that these officials have collected more than three hundred official samples for consideration by the Bureau of Chemistry. Through these two agencies a way has been found, so far as the Food and Drugs Act is concerned, to overcome in a fairly satisfactory manner some of the difficulties that arise out of our form of Government with its conflict of Federal and State jurisdiction.

The Food and Drugs Act was among the first of that group of laws which today would be classed as laws for the prevention of unfair competition. The suppression of fraud upon the consumer and of unfair competition among business rivals are but the two faces of the same coin. In consequence the food industries are sincerely and effectively supporting and helping the Bureau of Chemistry to enforce the law. Indeed, the Bureau is not infrequently appealed to by the industries to compel the cessation of unfair practices and to encourage the standardization of products when the industry is incapable by itself of bringing about these results. Instances of this kind may be found in the citrus-fruits industry, the evaporated-milk industry, and the sardine industry. The act has been one of the influences which has helped to draw competitors together into associations like the guilds of the Middle Ages, associations shorn of the special privileges which the ancient guilds often enjoyed. These associations have come to understand the value of constructive work and some of them devote considerable sums annually to experimental research designed to solve the technical problems with which the in-

dustry is confronted. Thus, there is made available to the small manufacturer scientific assistance which would ordinarily be obtainable only by large corporations maintaining their own staff of investigators. Since the Bureau of Chemistry has always regarded it as its duty not merely to report violations of the law but also to prevent violations by constructive work intended to improve methods of manufacture, it cooperates actively with such associations of manufacturers. Such cooperation by the various Government agencies is bound to exert the profoundest influence on the country's industrial and social development.

The best evidence that many of the abuses formerly occurring in the food industry have ceased, is to be found in the fact that the violations of the Food and Drugs Act observed today are hardly comparable with those which obtained during the first few years of the past decade. Most of the staple food products now found in violation are either of a higher grade than formerly, or are products of the clever adulterator, that is of those who have more or less anticipated the ordinary means of detection by so manipulating their products that not infrequently the adulteration can be detected only by the most detailed and painstaking chemical analysis coupled with factory inspection. In consequence there has been a decided change in the direction of the work. It has of recent years developed quite noticeably in the direction of factory sanitation, of the study of spoilage and decomposition of foodstuffs, and of the improvement through laboratory research of the methods of detecting the more refined new types of adulterations.

The Food and Drugs Act's chief contributions to the safeguarding of the peoples' health have been its effect upon the drug and patent medicine industry, upon the control of the traffic in polluted, decomposed or filthy foods and upon the elimination from foodstuffs of contamination with poisons such as lead and arsenic which entered the product because of the use of impure reagents in the process of manufacture, or of utensils constructed of improper materials.

The misbranding in regard to therapeutic value of hundreds of alleged cancer cures, of alleged cures for coughs, colds, consumption, etc., of alleged cures for diseases of the kidney, epilepsy, St. Vitus Dance, and the like, has been corrected. Unfortunately in many instances the result has been merely to transfer the false and fraudulent claims from the package to newspapers and other publicity media over which the act exercises no jurisdiction. The law requires the labels of patent medicines to declare the presence of any habit-forming drugs such as opium or cocaine or alcohol contained in them, thus preventing the innocent development of the drug habit which undoubtedly was common. This provision of the law is particularly valuable in warning mothers against the use of so-called infants' soothing sirups containing opium. It has without question done much to limit the use of medicines as tipples. In consequence of the requirement that habit-forming drugs be declared upon the label the formulae of some nostrums was changed by the reduction or even the elimination of the habit-forming agent. Drug addiction, in fact, was so prevalent that frauds in the treatment of these unfortunates became frequent. In most instances the treatment contained the very drug to which the person was addicted. Many of the purveyors of

these treatments were successfully prosecuted. Similar action was taken in regard to catarrh and asthma remedies containing cocaine. When the Act went into effect there were 30 soft drinks containing small amounts of cocaine, practically all of which were suppressed. There can be no doubt that the Act was an important factor in aiding the passage of the Harrison Anti-narcotic Law, which more effectively controls habit-forming narcotics than is possible under the Food and Drugs Act. Much has also been done to control the indiscriminate use of so-called headache mixtures containing dangerous depressing drugs and of dangerous cosmetics making therapeutic claims. The act has vastly improved the manufacture of pharmaceuticals such as extracts and tablets, and raised the quality of the supply of crude drugs since the importations of crude drugs are examined at the ports of entry. Finally, it may be stated that much evidence obtained in connection with the enforcement of the Food and Drugs Act was submitted to the Post Office Department and resulted in the issuance of fraud orders, a more effective way of dealing with many products than prosecution under the Food and Drugs Act. Among these may be mentioned lost manhood restorers, consumption cures, cancer cures, mechanical devices referred to in medical literature as "gas-pipe therapy," weight producers and general medicine schemes by which diagnoses are made and treatment administered by mail.

The methods of handling and labeling soft drinks and mineral waters have been revolutionized. One sure index of this improvement is the fact that the cleaning and bottling machinery of five years ago today out of date. The collection of a sample of mineral water which is contaminated is now unusual, while 10 years ago most of the samples collected were in an unsatisfactory condition. Regarding false labeling, it may be pointed out specifically that misrepresentations regarding so-called lithia waters and radioactive waters, as well as the great majority of exaggerated therapeutic claims, have been practically eliminated from the labels of these products. Today the so-called lithia waters and radioactive waters are not to be found on the market.

Much has also been done to safeguard the milk supply imported from Canada or shipped in interstate commerce. In the same manner, with the cooperation of the United States Public Health Service, the traffic in oysters polluted with sewage has been controlled. The traffic in decomposed canned fish, so-called "do-overs," has practically ceased. The shipment of decomposed canned beans and of decomposed shell eggs has been lessened. The manufacture of foods from refuse, especially tomato products, has been decreased and the sanitary conditions in food factories have correspondingly improved.

Ten years ago much of the baking powder, of the gelatin, and some of the confectionery was contaminated with small quantities of lead or arsenic. This is not the case to-day. The coloring of canned peas with copper has been suppressed, as has the use of a number of dangerous preservatives.

Among the practices not dangerous to health that have been controlled may be mentioned the addition of water to grain, to dried fruit, to sirups, to fruit juices, to oysters, to canned tomatoes, and the like; the substitution of glucose for cane or beet sugar, of synthetic

for natural products in flavoring extracts, of sugar sirup for maple sirup, and of hulls for cottonseed meal. The list might be extended vastly.

The act exercises control not merely over interstate shipments but also over imports. Indeed, it is somewhat broader in scope in its application to importations than to domestic shipments. In the last 10 years over 100,000 import shipments have been sampled and many times that number inspected. Practically all the various violations of the act mentioned in the preceding paragraphs have also been dealt with in connection with importations.

While the accomplishments of the Food and Drugs Act have been considerable, it must be admitted that it has its serious limitations. Especially conspicuous ones are the lack of legal standards for foods, of authority to inspect warehouses, and of any restriction whatever upon the use of many of the most virulent poisons in drugs; the limitations placed upon the term "drug" by definition which render it difficult to control injurious cosmetics, fraudulent mechanical devices used for therapeutic purposes, as well as fraudulent remedies for obesity and leanness; the limitation of dangerous adulterants to those that are added so that the interstate shipment of a food that naturally contains a virulent poison is unrestricted. Furthermore, the law fails to take cognizance of fraudulent statements covering foods or drugs which are not in or upon the food or drug package. Greater flexibility to prescribe the disposition of imports is also desirable. The Secretary of Agriculture has at one time or another recommended legislation to fill most of these gaps in the law. It should also be noted that at present there is no Federal law which prohibits unregistered or unlicensed persons from sending into interstate commerce medicinal agents, poisons, and the like, although they can not be sold locally by them nor indiscriminately even by registered or licensed pharmacists or physicians.

The constitutionality of the act has been questioned repeatedly without success. These cases and many others have clarified the significance of most of the provisions of the act, though certain other provisions, such as those dealing with "compounds," "blends," and "imitations," and the recent amendment requiring that foods in package form be labeled with the quantity of the contents of the food in the package still await complete interpretation by the courts.

Many matters of procedure have been fixed by the courts. Thus, in *United States v. J. Lindsay Wells Co.* (186 Fed. 248) and in *United States v. Baumert et al.* (179 Fed. 735), it was held that in cases under section 2 of the act the procedure may be by information, a practice that has been followed since 1909-10, although the first cases under the act were brought by indictment in 1907-8. In *United States v. 443 Cans of Frogen Egg Products* the Supreme Court held that cases *in rem* arising under section 10 of the Food and Drugs Act, after the filing of the libel and seizure of the goods, are common-law actions and subject to review only upon writ of error, in accordance with the rules of common law. In *United States v. 5 Boxes of Asafetida* (181 Fed. 561) it was held that section 10 of the act defines fully when and under what circumstances foods and drugs shall be forfeited, and is separate and distinct from section 2, and it is unimportant in forfeiture proceedings whether a person on the

same statement of facts could be convicted under section 2. Liability to seizure was held to depend upon whether the articles are adulterated or misbranded at the time of seizure, in addition to being adulterated or misbranded at the time of interstate shipment. In *United States v. Morgan* (220 U. S. 274, Office of the Solicitor Circular 58, Notice of Judgment 1992), the Supreme Court held that the notice and hearing required to be given parties from whom samples of food and drugs are procured by the Department for purposes of investigation are not jurisdictional facts, and consequently it is not essential that they be alleged in an indictment or information, and so need not be proved at the trial of the cases. In *United States v. J. L. Hopkins Co.* (199 Fed. 649, Notice of Judgment 2436) it was held that jurisdiction exists in the Federal Court of the District from which the goods were shipped, even though the defendant did not reside in that District. The court also held that violations of the Food and Drugs Act are subject to the general statute of limitations and that immediate prosecution is not required by section 5 of the act.

With reference to what constitutes an interstate shipment, it was held in *Philadelphia Pickling Co. v. United States* that a shipment by the manufacturer from his place of business in one state to his place of business in another state for testing of an adulterated article constituted a violation of the Food and Drugs Act. In *United States v. Powers-Weightman-Rosengarten Company*, a case under the Insecticide and Fungicide Act, a law which in general is analogous to the Food and Drugs Act, it was held that it is not an interstate shipment if goods in passing from one point in a state to another point in the same state traverse through another state. (Insecticide and Fungicide No. 75, Dom. No. 1055.) In *Hippolite Egg Co. v. United States* (220 U. S. 45, Notice of Judgment 1043) it was held that adulterated articles of food which have been transported in interstate commerce are subject to seizure and condemnation as long as they remain in the condition in which they were transported, that is, "in the original, unbroken packages."

The validity of the guarantee section, section 9 of the act, was upheld in *United States v. Charles L. Heinle Specialty Company* (Notice of Judgment 389, Circular 29, Office of the Solicitor), and in *United States v. Mayfield, et al.* (177 Fed. 765, Notice of Judgment 326). In the latter case it was decided that the guaranty is available to a dealer only when it relates to the identical article shipped by him and affords no defense to him when the guaranty relates only to a constituent used by him in manufacturing the article shipped; and further, that the officers of a corporation which manufactured an adulterated or misbranded food product shipped by its manager in interstate commerce are subject to prosecution therefor when they authorized the manager to operate the plant and sell the product without restriction, and the previous course had been to ship on orders to other states. In *Steinhardt Bros. Co. v. United States* (191 Fed. Rep. 798, Office of the Solicitor Circular 57) it was held that the guaranty contemplated under section 9 of the Food and Drugs Act to afford protection to the party making an interstate shipment of the adulterated or misbranded article must have been given prior to such shipment. In *Glaser, Kohn and Company v. United States* (Circular 84, Office of the Solicitor, 224 Fed. 84) it

was held that a guaranty in the form of a letter, expressed to be good until revoked on all articles sold continued to be good until revoked.

In accordance with the regulation originally made for the administration of the act it became the custom for manufacturers to place upon their labels the legend—"Guaranteed by _____ under the Food and Drugs Act, June 30, 1906." In 1913-14 the regulations were amended so as to require the cancellation of general guaranties filed with, and serial numbers assigned by, the Department and to prohibit the use upon labels of the above legend on the ground that the use of the legends and numbers upon packages of food and drugs conveys the false and misleading impression to the public that the articles have been examined and approved by the Government and that the Government guarantees that they comply with the law.

The term "original unbroken package," it has been held, is to be taken in its broad sense, and means a package made up by the manufacturer for sale to the ultimate consumer. The word "package" as used in sections 7 and 8 of the act is distinct from the term "original unbroken package" as used elsewhere in the act (*Dr. J. L. Stephens Company v. United States*, Notice of Judgment 2511, Circular 72, Office of the Solicitor). This decision is supported in effect by the decision of the Supreme Court in the State of Wisconsin *v. McDermott* (*McDermott v. State of Wisconsin*, 143 Wis., 18; 228 U. S., 115), a case not conducted by the Federal Government. In *United States v. 5 Boxes of Asafetida* (181 Fed., 561) it was decided that the taking of samples by claimant for the purpose of examination did not destroy the commercial form of the packages and did not incorporate the goods with the property of the state so as to remove them from the jurisdiction of the act over original packages.

With reference to the adulteration and misbranding of foods the following cases are of special interest. It was held in *United States v. Lexington Mill and Elevator Company* (232 U. S., 399, Circular 79, office of the Solicitor) that an article of food is adulterated if, because of any added poisonous or deleterious ingredient, it may by any possibility injure the health of the strong or the weak, the old or the young, the well or the sick, or any of these, or, conversely, that an article of food is not adulterated, within the meaning of the provision of the act by which an article is declared adulterated, "if it contain any added poisonous or other added deleterious ingredient which may render such article injurious to health," "if it can not by any possibility, when the facts are reasonably considered, injure the health of any consumer," even though it contain "a small addition of poisonous or deleterious ingredients." The same provision of the act was further construed by the Supreme Court in *United States v. 40 Barrels and 20 Kegs of Coca Cola* (241 U. S., 265; Circular 86, office of the Solicitor) in holding that the caffeine in Coca Cola is an "added" ingredient within the meaning of the act contrary to the opinion of the circuit court of appeals, which had held that a mixture or compound sold under its own distinctive name is not adulterated because it contains as one of its normal ingredients a poisonous or deleterious substance, since such poisonous or deleterious substance is not added to the article within the meaning of the provision, but is a part of it. In *United States v. American Chiclé*

Company it was held, in effect, that where an article contains but a trace of a valuable ingredient it is misbranded if named after that ingredient. In *United States v. 7 Cases of Buffalo Lithia Water* (Circular 78, office of the Solicitor) a similar principle is involved. An article labeled "Buffalo Lithia Water" was condemned as misbranded on the ground that the article did not contain sufficient lithium to entitle it to be labeled "lithia water." In *Hudson Manufacturing Company v. United States* (192 Fed. Rep., 90, Notice of Judgment 1451) it was held, in effect, that the use of a designation without well-known trade meaning for an imitation food product without giving any indication of what the article is composed, shows a clear case of misbranding. In *United States v. Charles G. Dade* it was held that the presence of *Bacterium coli* and *Streptococci* in milk in certain cases indicated decomposition or the presence of fecal matter which rendered the milk filthy. Analogous decisions have been reached with reference to the pollution of oysters, the decomposition of tomato products, of beans, and of other foods, although the action of the courts has not always been uniform. In *William M. Galt and Company v. United States* it was held that the presence of worms in flour rendered it adulterated because it was "filthy" within the meaning of that word as used in the act, "even conceding that the worms, insects, and beetles could be separated therefrom, the flour would still be contaminated by reason of its contact with them and would still contain more or less husks and excreta from the worms; that is, it would still be filthy within the meaning of the act." In *United States v. 13 Crates of Frozen Eggs* (208 Fed., 950, Notice of Judgment No. 2859) it was held that the act prohibits the transportation in interstate commerce of filthy, decomposed, or putrid eggs, and that such eggs, which have not been denatured, may be seized and condemned, even if the shipper intended them to be used for tanning, not for food purposes.

With reference to the adulteration and misbranding of drugs, the following are some of the more important decisions: In *United States v. Sixty-five Casks of Liquid Extract* (170 Fed., 449; Notice of Judgment No. 284) the claimants contended that the quantity or proportion of the drugs specified in section 8 of the act need not be declared in case of drugs which are not labeled or branded. The court ruled adversely to this contention, deciding, in effect, that the act not only requires that drugs shipped in interstate commerce and labeled shall not be misbranded, but requires that they shall bear labels conforming with its provisions. In *United States v. Antikamnia Chemical Company* (231 U. S., 654; Circular No. 76, office of the Solicitor) the Supreme Court sustained the validity of a regulation which requires that, in declaring the quantity or proportion of derivatives of any substance specified in section 8 of the Food and Drugs Act, the name of the specified substance, in addition to the trade name of the derivative, shall be stated. It was held, further, that the act itself requires that the name of the specified substance be stated if the article contain a derivative of it. In *United States v. Lehn and Fink* (Circular No. 49, office of the Solicitor) it was held that section 7 of the act which declares a drug to be adulterated if it "differs from the standard of strength, quality, or purity as determined by the test laid down in the United States Pharma-

copœia * * * official at the time of investigation," is not ex post facto legislation. It was further held that Congress in enacting this section did not delegate legislative power, but merely prescribed the method of ascertaining facts upon which the operation of the statute was to depend. In *Dr. L. J. Stephens Company v. United States* (Vid. Supr.) it was held that physicians' prescriptions are not exempt from the operations of the act.

United States v. Johnson (221 U. S., 488; Notice of Judgment No. 1058) was decided adversely to the Government. In this case misbranding was alleged of a so-called "mild combination treatment for cancer," consisting of several packages bearing statements that the treatment would effect the cure of cancer. It was held, in effect, that false and fraudulent statements as to the curative or therapeutic effects of medicines did not come within the prohibition of the law. The President thereupon addressed a message to Congress urging remedial legislation. On August 23, 1912, the act was amended (37 Stat., 416). The constitutionality of this amendment has been attacked without success.

On March 3, 1913, the act was further amended so as to require articles of food in package form to bear a statement showing the quantity of the contents in terms of weight, measure, or numerical count (37 Stat., 732).

On June 16, 1913, rule 39 of the rules and regulations made for the enforcement of the Food and Drugs Act was repealed. Under that rule domestic meat and meat-food products which were prepared under Federal inspection were exempted from the provisions of the Food and Drugs Act. As a result of the repeal, the power of seizure of unsound meat and meat-food products in the course of interstate commerce can be and has been exercised. Under the Meat Inspection Act spoiled meats could be condemned and destroyed only when they were found within establishments in which Federal inspection was maintained.



