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THE THIRTY-SIXTH REPORT ON
FOOD PRODUCTS
AND THE TWENTY-FOURTH REPORT ON
DRUG PRODUCTS

1931



Connecticut
Agricultural Experiment Station
New Haven

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CONTENTS AND SUMMARY—*Concluded*

Material	Page	Sampled by, or submitted to		Total	Adulterated below standard or other- wise illegal
		The Station	The Dairy and Food Commissioner		
DRUGS					
Acetic acid	719	0	7	7	2
Acetic acid, dilute	719	0	6	6	1
Ammonia, aromatic spirits of	720	0	20	20	6
Ammonia water	720	0	4	4	3
Arsenous acid, solution of	721	0	1	1	1
Arsenous and mercuric iodide, solution of	721	0	2	2	2
Bismuth, glycerite of	721	0	2	2	2
Calcium gluconate	721	3	4	7	0
Camphor liniment	722	0	10	10	1
Caraway, oil of	722	0	8	8	0
Chenopodium, oil of	723	0	1	1	0
Cinnamon, oil of	724	0	1	1	0
Cloves, oil of	724	0	3	3	0
Ferrous iodide, sirup of	725	0	22	22	1
Ferric citrochloride, tincture of	725	0	8	8	0
Ferric sulphate, solution of	725	0	2	2	0
Hydrochloric acid, dilute	726	0	22	22	6
Iodine, tincture of	727	0	1	1	0
Iron, reduced	728	0	4	4	0
Magnesia citrate of	728	0	26	26	14
Mercury, ammoniated	729	0	12	12	0
Mercury with chalk	729	0	4	4	0
Nitrous ether, spirit of	729	0	17	17	7
Nitrohydrochloric acid	729	0	7	7	0
Phosphoric acid, dilute	730	0	9	9	2
Potassium iodide, saturated solution of ..	731	0	5	5	2
Sulphuric acid, dilute	732	0	8	8	4
Thymol iodide	733	0	6	6	0
Turpentine	733	0	24	24	4
<i>Total for drugs</i>		3	246	249	58
MISCELLANEOUS					
Drugs and other materials	735	15	0	15	...
Materials examined chiefly for poisons ..	736	62	0	62	...
<i>Total for miscellaneous</i>		77	0	77	0
<i>Total for all exclusive of glassware</i>		457	1077	1534	218
Babcock glassware and thermometers ...	737	2720	0	2720	13

THE THIRTY-SIXTH REPORT ON FOOD PRODUCTS AND THE TWENTY-FOURTH REPORT ON DRUG PRODUCTS

E. M. BAILEY

This report summarized the work done during the year in connection with inspection and analysis of foods and drugs for purposes of control as provided by the statutes. Most of the samples examined have been submitted by the Dairy and Food Commissioner.

Collaborative work with the Tobacco Station and the Department of Soils has required analyses of about 100 samples of tobacco.

In the work on foods special attention has been given to eggs, spray residue on apples, and methods for analysis of salad dressings of the mayonnaise type. Members of the staff have also served as collaborators in studies of methods of analysis of foods, drugs, and cattle feeds for the Association of Official Agricultural Chemists. The Department has assisted the Dairy and Food Commissioner and the Director of the Station in preparing a revision of the rules and regulations for carrying out the provisions of the food and drug law. The chemist in charge has continued to serve as a member of the Food Standards Committee of the United States Department of Agriculture and of the Council on Pharmacy and Chemistry and the Committee on Foods of the American Medical Association.

Acknowledgment is made to all members of the Department Staff for collaboration in the work reported herein and in all other activities of the department.

FOODS

BEVERAGES

The law relating to bottled beverages holds the term "beverage" to include "all bottled carbonated beverages, including those commonly known as 'soda water'; all bottled non-alcoholic proprietary beverages by whatever names called, including malt and cereal drinks; grape, lime, and other fruit juices put up in containers; fruit-flavored sirups, powders or mixtures and concentrated fruit juices, when sold at retail and designed for the preparation of beverages through the addition of water, with or without sugar; and all bottled spring and mineral waters."

The law further stipulates that no impure, contaminated or polluted water and no adulterated material, saccharin or coal tar color, other than certified color, may be used in the manufacture of beverages. Beverages, other than cereal beverages, cider, or spring or mineral water, shall have a sugar content of not less than 5 per cent by weight.

Beverages as contemplated in the law, other than spring and mineral waters and malt and cereal beverages, may be classed in three general groups. On the one hand there are the uncarbonated, undiluted fruit juices; on the other the carbonated drinks of the soda water type; and between these groups a miscellaneous class of considerable variety embracing diluted juices of the type usually known as fruitades (for example, orangeade), drinks of the soda water type but containing some measure of natural fruit juice, and other combinations.

A definition for fruit juice in general, and definitions for two specific fruit juices have been adopted by the United States Department of Agriculture and are recognized in the regulations of this State. These definitions are as follows:

Fruit juice is the unfermented liquid obtained from the first pressing of sound, ripe, fresh fruit or its pulp, and conforms in name to the fruit from which it is obtained.

Grape juice is the unfermented juice of sound, ripe grapes. It is obtained by a single pressing of the fruit, with or without the aid of heat, and with or without the removal of insoluble matter.

Orange juice is the unfermented juice obtained from sound, ripe, sweet oranges. It may contain a portion of the pulp and/or of the volatile oil.

There is no general definition for "soda water" but a number of specific products in this general class have been defined.

Ginger ale flavor, ginger ale concentrate, is the beverage flavor in which ginger is the essential constituent, with or without aromatic and pungent ingredients, citrous oils, fruit juices, and caramel color.

Ginger ale is the carbonated beverage prepared from ginger ale flavor, harmless organic acid, potable water and a sirup of one or more of the following: sugar, invert sugar, dextrose; with or without the addition of caramel color.

Sarsaparilla flavor is the beverage flavor prepared from oil of sassafras and methylsalicylate, or oil of wintergreen or oil of sweet birch, with or without other aromatic and flavoring substances and caramel color. It derives its characteristic flavor from oil of sassafras and methylsalicylate.

Sarsaparilla is the carbonated beverage prepared from sarsaparilla flavor, potable water, and a sirup of one or more of the following: sugar, invert sugar, dextrose; with or without harmless organic acid, and with or without the addition of caramel color.

Root beer flavor, root beer concentrate, is the beverage flavor in which oil of sassafras and methylsalicylate (or oil of wintergreen or oil of sweet birch) are the principal flavoring constituents, and contains other flavoring substances, with or without the addition of caramel color.

Root beer is the carbonated beverage prepared from root beer flavor, potable water and a sirup of one or more of the following: sugar, invert sugar, dextrose; with or without harmless organic acid, and with or without the addition of caramel color.

Birch beer flavor, birch beer concentrate, is the beverage flavor in which methylsalicylate (or oil of sweet birch or oil of wintergreen) and oil of sassafras are the principal flavoring constituents, with or without other flavoring substances, and with or without caramel color. The flavor of methylsalicylate predominates.

Birch beer is the carbonated beverage prepared from birch beer flavor, potable water, and a sirup of one or more of the following: sugar, invert sugar, dextrose; with or without harmless organic acid, and with or without the addition of caramel color.

Cream soda water flavor, cream soda water concentrate, is the beverage flavor prepared from vanilla, tonka, vanillin, or coumarin, singly or in combination, together with other flavoring substances; with or without the addition of caramel color.

Cream soda water, "cream soda," is the carbonated beverage prepared from cream soda water flavor, potable water and a sirup of one or more of the following: sugar, invert sugar, dextrose; with or without harmless organic acid, and with or without the addition of caramel color.

Two hundred and fifty-eight samples were examined, all submitted by the Dairy and Food Commissioner, and were for the most part of the soda water type. Sugar content exceeded 5 per cent in all cases and in no instance was saccharin found. Artificial color and flavor, if present, were declared in practically all samples. Of 120 samples of ginger ale the highest sugar content was 12.3 per cent, the lowest 5.8 per cent and the average of all was 9.0 per cent. Only 24 samples contained more than 10 per cent of sugar.

A sample sold as a fresh fruit orange drink was found to contain 14.8 per cent of sugar, which was nearly all sucrose, and .063 per cent of ash. Assuming 0.4 per cent of ash as fairly typical of orange juice this sample contained about 15 per cent of actual juice, which is enough to characterize the beverage as an orange drink or as "orangeade," but such a product should not be offered as orange juice.

EGGS

The so-called "cold storage egg law" provides that eggs that have been preserved by any artificial process, or that have been kept in storage for 15 days or more in any place where the temperature is reduced by means of artificial refrigeration, or that have been incubated for 24 hours or more, shall be marked "cold storage eggs," "preserved eggs," or "incubator eggs," as the case may be, if such eggs are sold or offered for sale. Wholesalers are required to state on invoices whether eggs sold are "fresh" or of the classifications noted above. This law has been in effect for many years

and is under the administration of the Dairy and Food Commissioner.

More recently a law authorizing the Commissioner of Agriculture to establish grades for fresh eggs has been enacted (Public Acts 1931, Sec. 336 a). This act prohibits the sale or the advertising of eggs as "fresh," "strictly fresh," "hennery," "new laid," or like descriptions if such eggs are not in fact fresh eggs. The act specifies the characteristics of fresh eggs, to be determined by candling, as follows: Air cells not more than .25 inches deep, localized and regular; whites firm and clear; yolks allowed to be visible; no visible germ development.

Some confusion arose in the trade in attempting to abide by the requirements of both laws. There was some uncertainty as to how to label eggs that were not cold storage, preserved, or incubated, but that would not meet the specifications laid down for fresh eggs in the newer statute. To meet this situation a ruling was made by the Dairy and Food Commissioner and the Director of this Station, the ruling being concurred in by the Commissioner of Agriculture and representatives of the trade, which held that eggs that were not cold storage, preserved, or incubated, and that were not properly described as fresh under the provisions of the fresh egg law, could be designated and sold as "eggs" without further qualification. The text of the ruling is as follows:

Section 2453 of the General Statutes relates to the sale of eggs and prescribes how eggs of various classes therein named shall be labelled. The intent of the Statute is that eggs sold or offered for sale shall be labelled and invoiced in a manner that is informative of their character. It is recognized however, that there are at times in the channels of trade, eggs that are not properly designated by the terms named in the statute, i.e., "cold storage eggs", "preserved eggs" or "incubated eggs", and that do not have the characteristics necessary to warrant designation as "fresh eggs".

For the guidance of the trade, and to relieve the uncertainty that has arisen as to an acceptable labelling for eggs of this type and class, it is held that an adequate designation for such eggs will be the unqualified name "eggs". The understanding of this term is that eggs so designated do not conform to the specifications laid down for "fresh eggs" (Chapter 124, Public Acts 1931) and are not "cold storage", "preserved" or "incubated", but are, nevertheless, wholesome and edible eggs.

Objective examinations in the laboratory, including candling, examination of the egg on breaking out of the shell, ammoniacal nitrogen content, and examination of the shell for evidence of dipping, serve to determine with reasonable certainty whether eggs are entitled to the designation of fresh. The same data often will make it possible to form an opinion as to the character and quality of eggs that are not fresh. Experience has shown that eggs conforming to the specification given for fresh eggs will generally have an ammoniacal nitrogen content of less than 2 mgms. per 100 gms. of

egg. Cold storage eggs may have considerably enlarged air spaces but the ammoniacal nitrogen will be of about the same order as that of fresh eggs. If however, eggs are dipped before being placed in storage the air spaces and ammoniacal nitrogen may not be appreciably different from fresh eggs. Examination of the shell in such cases should indicate the fact of dipping. Eggs that have been dipped but not subsequently held at reduced temperatures will show small air spaces but the ammoniacal nitrogen generally will be greater than is found in fresh eggs. In stale eggs air spaces will be large and the ammoniacal nitrogen high.

With careful methods of handling it is possible to ship eggs for long distances and have them qualify as fresh when they arrive in local markets. Thus a lot of California eggs, not dipped and not refrigerated except during transit, were found to have air spaces less than one-quarter inch in depth and less than 2 mgms. of ammoniacal nitrogen per 100 grams of egg. Eggs sold as "Fresh Western" therefore may meet the specifications for fresh eggs and should do so to merit that qualification.

Of a total of 101 samples of eggs examined during the year, practically all submitted by the Dairy and Food Commissioner, 44 were found to be improperly labelled.

FATS AND OILS

BUTTER

Butter is the only article of food the definition and standard for which is fixed by act of Congress. This product may not contain less than 80 per cent of milk fat. No moisture limit is specified but butter will generally not contain more than 16 per cent of water.

Eighteen samples of butter were examined. Two were short weight and one was rancid and mouldy. The short weight samples were purchased at the stores of James Van Dyke Co. on Main Street and on Asylum Street, Hartford. The rancid and mouldy sample was purchased of C. Nesei in Bristol.

OLEOMARGARINE

The law in this state regulating the sale of imitation butter specifies that oleomargarine may be made and sold provided that it is so labelled as to advise the consumers of its real character and that it is free from coloration and from any ingredient intended to cause it to look like butter. The interpretation placed upon this statute is that oleomargarine may not contain color added for the sole purpose of imparting coloring, but that the inclusion of fats or oils that are in themselves of some degree of yellow and thereby impart

a yellow shade to the finished article is not in violation of the law. This interpretation has been placed upon similar language in the oleomargarine laws of other states, notably Massachusetts and Michigan, and upheld by court decisions.

Federal laws regulating taxes upon oleomargarine impose a tax of one-quarter of one cent per pound upon uncolored oleo and 10 cents per pound upon colored oleo. Formerly the product was held to be colored if ingredients of such character and in such amounts were added as to serve the sole purpose of producing color. Naturally colored fats that served as bona fide and substantial part of the article did not bring the product within the classification of colored oleomargarine. An act of Congress approved March 4, 1931, however, amended previous regulations in this respect and at present colored fats or oils may not be used in the manufacture of oleomargarine if they impart a shade of yellow greater than 1.6 degrees of yellow and red collectively, unless the product is classed as colored and taxed accordingly. Since a tax of 10 cents per pound is prohibitive, oleomargarine will no longer be made from fats possessing any considerable degree of yellow.

Artificial color may still be added to butter and the amount is not restricted.

Only one sample of oleomargarine was submitted. This was before the amended Federal regulation became effective. The sample was colored, but not artificially colored.

OLIVE OIL

Twenty-three samples of olive oil were examined and 5 were found to be adulterated.

Cottonseed oil and sesame were the adulterants in three samples all purchased from the International Importing Co. of Hartford and Waterbury. Two samples submitted by the Department of Health of New Haven were adulterated with cottonseed oil and in one case artificial color was also found.

DRIED FRUITS

Having had occasion to inquire into the question of moisture content of dried fruits the following data (Table 1), are recorded for purposes of reference. In a measure moisture content is self-limiting because high moisture in dried fruits is not conducive to good keeping quality. The present moisture standard for dried apples permits not more than 24 per cent. No limit has been fixed for other dried fruits.

TABLE 1. RECORDED ANALYSES OF THE MOISTURE CONTENT OF DRIED APPLES, APRICOTS AND PEACHES

Apples						Apricots				Peaches				References
Number	Maximum	Average	Mean	Number Analyzed	Maximum	Minimum	Average	Mean	Number Analyzed	Maximum	Minimum	Average	Mean	
1	33.00	33.00	33.00	1	32.44	32.44	32.44	32.44						E. W. Hilgard. Univ. Cal. Agr. Exp. Sta. Bull. 97, 7 (1892)
3	47.40	28.1	28.0	2	32.4	26.4	29.4	29.4						W. O. Atwater, and A. B. Bryant. U. S. D. A. Off. Expt. Sta. Bull. 28 rev, 73 (1899).
				4	31.3	29.2	30.3	30.3						A. Kickton. Z. unt. Nahr. Genusssm., 8, 675 (1904).
				1	38.49	38.49	38.49	38.49						M. Greshoff, W. M. Cluwen, C. L. DeFouw. Z. unt. Nahr. Genusssm., 13, 434 (1907).
1	36.22	36.22	36.22	1	27.00	27.00	27.00	27.00	1	27.00	27.00	27.00	27.00	J. E. Z. Bosz. Z. unt. Nahr. Genusssm., 19, 747, (1910).
9	21.72	16.58	15.71	11	26.17	14.7	23.48	20.44	13	24.50	13.1	19.63	18.80	A. McGill. Lab. Inland Rev. Dept. Canada, Bull. 352, (1916).
88	33.15	19.66	21.44	30	27.91	14.20	19.58	21.06	39	23.88	9.62	17.03	16.75	A. McGill. Lab. Inland Rev. Dept. Canada, Bull. 375, (1917).
102	47.4	26.71	28.0	63	35.75	11.49	26.90	23.62	53	27.00	9.62	21.22	18.31	T. F. Hunt. Rept. Coll. Agr. Expt. Sta. Univ. Cal., 1918-1919, 36, (1918). All reports.

NOTE: McGill in next to last reference states that Canadian standard for apples in 1912 was 27 per cent moisture, changed in 1916 to 25 per cent because higher standard was inconsistent with good keeping quality.

SPECIAL AND MISCELLANEOUS FOODS

GLUTEN FLOUR

The standard for gluten flour specifies that this product shall not contain more than 10 per cent of moisture and, on a water-free basis, not less than 7.1 per cent of nitrogen, nor more than 56 per cent of nitrogen-free extract, and not more than 44 per cent of starch. The factor 5.7 is used in estimating protein.

Five samples representing well-known brands of gluten flour were examined and all met the standard for moisture and nitrogen. Previous analyses indicate that in gluten flours of standard nitrogen content the carbohydrate will not be excessive. Partial analyses are given in Table 2.

TABLE 2. PARTIAL ANALYSES OF GLUTEN FLOURS

No.	Manufacturer	Moisture per cent	Nitrogen Moisture-free basis per cent
48993	The Battle Creek Food Co., Battle Creek, Michigan	8.91	8.64
49705	The Farwell & Rhines Co. Inc., Watertown, N. Y.	8.76	7.78
48995	Federal Milling Co., Lockport, N. Y.	9.04	7.61
48997	Parker-Wrightington Co., Boston, Mass.	8.90	7.83
49702	Piser-Livingston Co., Chicago, Ill.	8.80	8.25

GLUTEN BREAD

There is no official definition or standard for gluten bread, but since the article is used because of its reduced carbohydrate content as compared with ordinary white bread the flour ingredient should be gluten flour. Breads that do not differ essentially from white bread should not be designated as gluten breads.

In Table 3 are given analyses of gluten breads. Many of these are local brands and were submitted by the Dairy and Food Commissioner. Others were submitted by purchasers or others interested. For comparison a fairly typical analysis of ordinary white bread is given as the last item in the table. It will be noticed that these gluten breads generally exceed the moisture limit for ordinary bread, which is 38 per cent. No. 48999 is a so-called aerated bread, which is to say it is not a moist loaf but an air-dry loaf. The protein content is from 2.5 to 3.5 times that of ordinary bread and the carbohydrate (nitrogen-free extract), is correspondingly less than that found in ordinary white bread.

Five other samples of miscellaneous materials examined for purchasers, dietitians, or others interested, are tabulated in Table 4.

TABLE 3. ANALYSES OF GLUTEN BREAD

No.	Dealer	Moisture %	Ash %	Protein (N x 3.7) %	Fiber %	Nitrogen-free extract %	Fat %
49706	<i>Danbury</i> The Mohican Market	38.15	2.70	25.01	0.18	31.47	2.49
49715	<i>Hartford</i> Beroth Bakery	45.01	1.94	27.04	0.27	22.10	3.64
49716	The Hartford Market Co.	41.48	2.15	28.15	0.21	24.59	3.42
49722	Keney Tower Bake Shop	34.38	2.26	20.68	0.22	34.91	7.55
48999	Newton Robinson Grocery Co.	7.45	1.17	43.95	0.28	38.76	8.39
49745	Parkville Market	34.45	1.47	26.38	0.29	34.39	3.02
48996	<i>Middletown</i> Stueck's Bakery	45.49	1.35	22.84	0.14	28.85	1.33
49700	<i>New Britain</i> Hoffman's Bakery	41.60	1.58	24.12	0.24	28.43	4.03
49719	<i>New Canaan</i> The Walter Stewart Co.	39.65	1.80	30.87	0.15	25.82	1.71
49703	<i>New Haven</i> Federal Bakery	41.31	2.47	21.99	0.28	27.47	6.48
49704	The Mohican Co.	39.92	2.09	26.21	0.19	27.93	3.66
48994	Shartenberg's	44.83	1.38	27.21	0.40	24.16 ⁴	2.02
8334	Penn Gluto Bread (subm'd. by purchaser)	35.73	1.35	20.74	0.75	32.63 ³	8.80
48998	<i>New London</i> The Mohican Market	38.32	2.16	21.40	0.25	33.37	4.50
49727	<i>Norwich</i> Community Bake Shop	42.63	1.36	25.72	0.27	27.91	2.11
49725	The Mohican Market	37.69	2.38	27.11	0.34	29.25	3.23
49701	<i>Plainville</i> Rogers Bakery	44.14	1.39	23.83	0.25	28.46	1.93
49718	<i>Ridgefield</i> Ridgefield Bakery	41.78	1.81	25.46	0.31	28.69	1.95
49729	<i>South Manchester</i> Quality Bakery	41.22	1.44	24.91	0.30	29.70	2.43
	<i>Typical analysis of common white bread</i>						
	Conn. Exp. Sta., Bull. 286, p. 300	35.3	1.1	9.2	0.5	52.6	1.3

Gluten Bread

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³Starch 18.89 per cent; water-soluble carbohydrate 2.68 per cent.⁴Starch 24.35 per cent; water-soluble carbohydrate 2.35 per cent.

TABLE 4. ANALYSES OF SPECIAL AND MISCELLANEOUS FOODS

No.	Material	Moisture	Ash	Protein (Nx6.25)	Fiber	Carbohydrate		Fat
						Starch	Unde- termined	
6544	Glutosac Bread, Health Food Co., New York City.....	% 30.00	% 1.90	% 31.08 ¹	% 0.84	% 26.64 ²	% 7.57	% 1.97
6983	Golden Loaf Soya Bread, S. B. Thomas, Inc., Long Island City, N. Y.	% 36.96	% 1.90	% 12.00	% 0.59	% 45.21	% 52.55	% 3.34
6481	Manbeck's Sweet Loaf Bread, Man- beck Baking Co., Harrisburg, Pa.	% 34.75	% 1.63	% 9.58	% 0.43	% 0.50 ³	% 3.69	% 1.06
5889	Pharma-Craft Dietetic Flour	% 4.93	% 7.39	% 82.44	% 0.35	% 20.44	% 3.69	% 0.70
8596	Kornlet, The Haserot Co., Cleveland, O. . .	% 75.12	% 0.99	% 2.24	% 0.30	% 20.44	% 3.69	% 0.91

¹N x 5.7²Includes 2.29 per cent water-soluble.³Includes water-soluble.

ICE CREAM

Only 38 official samples of ice cream have been examined for the Dairy and Food Commissioner during the year. Chemical tests for fat content have been made on a large number of samples each year for some time past and a very few instances of sub-standard products have been found. Fat content has generally exceeded the minimum standard of 8 per cent by very considerable margins. In inspection this past year more emphasis has been given to conditions of sanitation under which ice cream has been dispensed and this has involved bacteriological examinations, which we are not equipped to make, and such samples have been referred to the laboratory of the State Board of Health.

All of the official samples referred to us for chemical tests have been found to exceed the legal requirement as to fat content.

Twelve unofficial samples submitted by purchasers or others interested have been examined. One of these samples was chocolate ice cream suspected of containing foreign fats, but examination of the fat isolated from the sample disclosed no deviations from the constants for milk fat other than such as might be expected by reason of the cacao fat present.

MEAT PRODUCTS

Six official samples of frankfurts were examined and two were found to contain excess of starchy material. Frankfurts may contain 3.5 per cent of cereal according to government regulations and the regulations in this state, provided however that the presence of cereal or other starchy material is declared. Such additions in excess of 3.5 per cent are not permissible even if declared.

Ten unofficial samples were examined for excess moisture. This work was chiefly of a collaborative nature to study analytical methods involved.

CANNED FISH

Six cans of crab meat were submitted by the Dairy and Food Commissioner. The contents of five of the cans were clean and wholesome so far as could be determined by odor and general appearance. In one can the meat was evidently unfit for food. It is not always easy to conclude whether foods are unfit for consumption under that clause of the law that declares food adulterated if it is filthy, decomposed or putrid. We seldom find foods offered for sale that may properly be described as filthy or putrid; and decomposition must be interpreted with some reservation. Disorganized or uncontrolled decomposition is the meaning con-

templated by the statute, because some foods, certain types of cheeses for example, regarded as delicacies are prepared by processes that involve intentional decomposition. In judging food suspected of being injurious to health, if the article differs markedly from the normal product of its type the food had better be regarded with suspicion and rejected. The benefit of the doubt should be given to the consumer and not to the food.

Another instance of suspected food was a case of a shipment of canned shrimp. Seven samples were submitted by the Dairy and Food Commissioner. Small crystals aroused suspicion on the part of the consumer that ground glass was present. Six of the samples were found to contain crystals which gave positive tests for ammonium, magnesium, and phosphate. It appears that in certain shell-fish, shrimp particularly, conditions are favorable for the formation of small crystals of hydrogen-ammonium-magnesium phosphate (Struvite), and the presence of this salt is not cause for alarm.

MILK AND MILK PRODUCTS

MARKET MILK

Two hundred and forty-four official samples of milk were submitted by the Dairy and Food Commissioner. About 60 per cent of these were not found adulterated. Roughly 20 per cent were adulterated by watering, or skimming, or both, and the remainder were below standard in some particular.

The distribution of samples is given in the following summary.

SUMMARY OF INSPECTION		
	Number of samples	Per cent
Not found adulterated	142	58.2
Adulterated by watering	20	8.2
Adulterated by skimming	29	11.9
Adulterated by skimming and watering	1	0.4
Below standard:		
in solids and solids-not-fat	24	9.8
in solids and fat	7	2.9
in solids, fat and solids-not-fat	21	8.6
Totals	244	100.0

It should be noted that the relatively large proportion of adulterated samples can not be taken as an indication of the general run of market milk furnished to consumers in this State, because in most cases the samples collected by the inspectors were taken on complaints of local health officers or milk inspectors where some reason to question the character and quality of milk had arisen.

Ninety-two samples of milk drinks commonly known as plain milk shakes were examined. In this type of drink the additions made are not sufficient to alter appreciably the composition of the milk used in their preparation. About 35 per cent of the samples examined showed marked indications that skimmed milk was used. In many cases the tests indicated milk richer than the average in fat. The practice of preparing these drinks from milk in quart bottles explains the results found; top milk is dispensed at first and the last of the bottle contents is skimmed milk.

Two hundred and fifty unofficial samples of milk were tested for dairymen and others, chiefly for purposes of checking up on the production of individual cows in the herds.

In addition to these eight samples of cream, two of evaporated milk, two of chocolated milk, and two samples of breast milk were analyzed.

TABLE 5. ADULTERATED MILK

No.	Dealer	Solids	Fat
	Containing added water		
	<i>Beacon Falls</i>	%	%
49445	Mrs. Bertha Sledjewski	6.24	1.8
49446	Mrs. Bertha Sledjewski	6.54	2.2
	<i>Branford</i>		
49417	Leo Novak	10.18	2.9
49418	Leo Novak	10.71	3.3
	<i>Bridgeport</i>		
47335	Clover Farms, Inc.	10.59	3.2
	<i>Cromwell</i>		
47710	Sebastiano Amenta	10.34	3.2
	<i>Danbury</i>		
49685	William Worden	10.57	3.6
	<i>Milford</i>		
49050	Harry Kivic	9.80	2.6
49051	Harry Kivic	10.49	3.2
	<i>Naugatuck</i>		
49662	Thomas Elliott	11.07	3.7
	<i>New Milford</i>		
49052	Myer Noblestein	9.28	2.9
49053	Myer Noblestein	9.50	3.0
	<i>Sharon</i>		
48580	H. W. Neil	10.68	3.4
48581	H. W. Neil	9.04	2.7
48582	H. W. Neil	9.65	3.0
48583	H. W. Neil	9.41	2.9

TABLE 5. ADULTERATED MILK—(Continued)

No.	Dealer	Solids	Fat
	<i>Shelton</i>	%	%
47341	Peter & Eva Zabowski	11.49	4.3
	<i>Wallingford</i>		
49401	Rudolf Miller	7.78	2.4
49402	Rudolf Miller	10.19	3.2
49403	Rudolf Miller	6.74	1.8
	Skimmed milk		
	<i>Meriden</i>		
47218	Graber's Drug Store	10.26	1.3
47217	Leonard Petrucelli	11.88	2.7
47222	Polos Poulos	10.96	1.9
47223	Victor W. Schmelzer	11.24	2.0
	<i>New Haven</i>		
47135	Bezner Drug Store	11.94	2.9
47126	James D. Curey	11.75	2.8
47055	Deegan & Hope Drug Co.	10.81	2.1
47093	Fanny Dwartz	10.79	2.0
47069	East Rock Confectionery	10.02	1.2
47066	East Rock Pharmacy	10.91	2.4
47140	F. S. Grady	9.70	1.1
47091	Lynch Pharmacy	10.76	2.3
47092	A. D. Milliaris	10.64	2.0
47136	Roger Sherman Pharmacy	11.34	2.4
47062	Mark Sullivan	11.36	2.6
47131	Westville Confectionery	11.15	2.2
47137	Whalley Spa	9.25	0.6
47125	Yeager Drug Store	10.68	1.9
	<i>New London</i>		
47053	B. J. Haddad	12.44	2.9
	<i>Norwalk</i>		
47212	A. Propocis	9.14	0.7
	<i>Stamford</i>		
47086	The Church Pharmacy	11.13	2.5
47073	Farrante Pharmacy	9.47	1.1
47200	C. S. Finch	10.41	1.9
47079	Victor B. Frank	10.66	2.3
47201	J. Javras	10.55	1.9
47087	Liggett Drug Store	11.20	2.5
47202	George C. Murphy Co.	10.83	2.4
47071	M. Scatamacchia	10.17	1.6
47081	N. Sotire	10.71	2.0
	Watered and skimmed		
	<i>New Haven</i>		
47138	Conway Candy Shop	7.39	1.7

MAYONNAISE

The present definition and standard for mayonnaise as announced by the United States Department of Agriculture are as follows:

"Mayonnaise, mayonnaise dressing, mayonnaise salad dressing, is the semi-solid emulsion of edible vegetable oil, egg yolk, or whole egg, a vinegar and/or lemon juice, with one or more of the following: salt, other seasoning commonly used in its preparation, sugar and/or dextrose. The finished product contains not less than 50 per cent of edible vegetable oil."

Mayonnaise is essentially an egg and oil dressing. The minimum percentage of egg yolk and oil, 78 per cent, specified in an earlier definition, has been deleted and the only numerical standard now provided is a minimum of vegetable oil, that is, 50 per cent. A suitable proportion of egg is necessary, however, to insure a semi-solid consistency of the finished product since other thickening agents are not permitted by the definition. It is still pertinent to know the proportion of egg or of egg yolk in mayonnaise, although no numerical limit is established for this ingredient.

The present tentative method for estimating egg in egg products is based upon the determination of lipid phosphoric acid which is characteristic of egg yolk but not of egg white. The method is admittedly only approximate. Apparently if freshly made mayonnaise is examined the egg content can be estimated with reasonable accuracy. This has been true at least with dressings made in the laboratory in which egg yolks of known lipid phosphoric acid content were used.

It was noted however that these laboratory-made dressings on holding were subject to some change that resulted in a loss or transformation of lipid phosphoric acid. The same change was noted also in commercial products when a series of samples from the same batch were examined shortly after manufacture and at various intervals up to several months thereafter. The magnitude of these changes was sufficient in some instances to render estimates of egg yolk content quite unreliable. It was found that the total phosphoric acid content, however, remained practically constant. The summary on page 714 for both lipid phosphoric acid and total phosphoric acid gives results that are typical of our experience.

It is quite evident that in a survey of commercial mayonnaise, products of various ages will be encountered. Those of recent manufacture may be evaluated as to egg content with fair accuracy on the basis of L-P.O., but if some time has elapsed since the products were made, that is, 6 weeks or longer, estimates of egg content may be considerably too low. The greater constancy of

the total phosphoric acid content suggests that it is a safer basis for evaluation of egg content than is the lipid phosphorus.

LIPOID P_2O_5 AND TOTAL P_2O_5 IN MAYONNAISE AT INTERVALS
AFTER MANUFACTURE

	Lipoid P_2O_5 %	Total P_2O_5 %
Laboratory Sample A, initial	0.091	0.139
after 6 weeks	0.065	....
Commercial Sample B, initial	0.063	0.102
after 3 months	0.043	0.099
after 6 months	0.036	0.100
Laboratory Sample C, initial	0.174	0.277
after 2 months	0.166	0.274

In estimating egg yolk content from the total phosphoric acid value a factor must be chosen and this must be based upon average values, as in the case of the factor for lipid phosphoric acid. In making our laboratory mayonnaise, yolks of fresh eggs were used and the total phosphoric acid content of the yolks was about 1.4 per cent. Results reported by Cook (*Allen's Commercial Organic Analysis* 4th Ed., Vol. 8: 446) show 1.39 per cent for boiled yolks of fresh eggs and an average 1.4 per cent for yolks from cold storage eggs. Unpublished results furnished us (by courtesy of another investigator) show about 1.4 per cent for fresh and "commercial" fresh egg yolk and a little lower, 1.3 per cent, for yolks from cold storage eggs. It seems fair to assume 1.4 per cent as the average total phosphoric acid content of egg yolk for purposes of calculation.

It is true, of course, that all of the phosphoric acid in mayonnaise does not come from egg; some will be supplied by the vinegar, particularly if cider vinegar or malt vinegar is used, and a little will come from the spices and seasoning. If distilled vinegar is used the non-egg phosphorus in the finished mayonnaise may be regarded as negligible. In our experimental dressings made with cider vinegar, corrections of 0.01 to 0.02 per cent have been justified, but it is obvious that in the examination of market samples an intelligent application of such a correction factor cannot be made.

Applying this dual method of estimating egg yolk to the experimental samples already referred to, reckoning from lipid phosphoric acid on the basis of the factor 0.89, and without correcting the total phosphoric acid for non-egg phosphorus, the following comparative values are obtained:

Sample	Estimated egg yolk, from		
	Lipoid P_2O_5 %	Total P_2O_5 %	Formula %
Commercial Sample A, initial	7.1	7.3	7.0 ¹
after 3 months	4.8	7.1	..
after 6 months	4.0	7.1	..
Laboratory Sample B, initial	19.6 ²	19.8 ³	18.8
after 2 months	18.7	19.6	..
Commercial Sample C, initial	14.8	15.1	15.0 ¹
Commercial Sample D, initial	8.4	10.0	..

A survey of commercial mayonnaise products was made in 1930 and the results published in Bulletin 329. The products were judged on the basis of the standard for mayonnaise which was in force at that time and which required a minimum of 78 per cent for egg yolk and oil combined. All of the products substantially met or exceeded this specification with three exceptions. One of these exceptions was Shady Lane brand made by Ivanhoe Foods, Inc., No. 46884. This brand should not have been included in the list because it was not sold as a mayonnaise but merely as a salad dressing. Attention was called to the uncertainties in estimating egg yolk content by present available methods and particularly to the possible transformation of lipid phosphoric acid in products that have aged.

In the examination of mayonnaise samples that have been submitted during the past year we have estimated the egg yolk content on the basis of total phosphoric acid in view of the evidence already discussed. The values for egg yolk are still approximate, but they are based upon an index that is much more satisfactory than the one hitherto employed. Whatever more accurate methods may be devised, the simple determination of total phosphoric acid appears to afford a valuable check upon egg yolk content of mayonnaise and for practical purposes is probably sufficiently accurate. (See Table 6).

SPRAY RESIDUE ON APPLES GROWN IN CONNECTICUT

The spraying of fruit and vegetables as a means of controlling insect pests and fungus diseases has become an established practice in this country. Some of the materials used for this purpose are notably poisonous, for example the arsenicals. When these spray materials carry over into the product that is offered to the consumer for food, a problem for food control officials arises because of the provision in the food law that declares an article

¹Manufacturer's estimate from formula.

²Using factor 0.95, the actual L- P_2O_5 in egg yolk used, the percentage is 18.3.

³Deducting .02 per cent for non-egg P_2O_5 the percentage is 18.4.

of food adulterated if it contains any added poisonous or deleterious substance that may render the food injurious to health.

In the last 10 years or more increasing attention has been given to the question of spray residues on fruits and vegetables as offered for sale. It is agreed by all concerned that it is imperative to safeguard the consumer and prevent the transportation and sale of fruits bearing dangerous quantities of poisonous spray residues. To this end growers, distributors and control officials both State and Federal, have cooperated.

Attention has centered largely or entirely upon arsenic and the metal often associated with it, that is, lead. Although it is desirable that these objectionable spray residues be entirely eliminated it does not appear to be easily possible to do so according to practical experience thus far acquired. The so-called world, or international, tolerance of 0.01 grain per pound is accepted by qualified authorities as a reasonable limit to safeguard the consumer properly. This tolerance was agreed upon by the British Royal Commission appointed to investigate beer poisoning cases that occurred in England many years ago, and it appears to have withstood the critical examination of toxicologists in this country.

At the present time¹ no exception is taken to arsenic residues of slightly more than .01 grain, but eventually, and as soon as possible, the world tolerance will be observed.

From time to time in recent years samples of fruit and vegetables suspected of dangerous contamination have been submitted to the Station. In no cases, however, have we found quantities in excess of those regarded as harmless. Quite recently a more extended survey was made collaborating with the Station Pomologist, who secured the samples. In brief the plan adopted was to survey the orchard and select samples that showed the most conspicuous amounts of residue, at the same time noting as well as possible the probable proportion of the total yield that such samples comprised. The reason for such a procedure is obvious: our interest was not to find the probable average arsenic residue, but rather to find the dangerous excesses and, if such were found, to be able to form some conclusion as to how great a proportion of fruit was thus contaminated.

Nineteen samples were collected in various localities of the state. Some were taken from the trees, some from sorting tables, and others from boxes as prepared for shipment. Notes were also taken as to the time when the last application of spray was made. The results can be very shortly summarized by saying that none approached the tolerance of .01 grain at all closely; the nearest approach to it was about one-half of the accepted limit, .0053 grain. The smallest amount found was .0007 grain, and excluding the one high figure just noted the range was from .0007 to .0039 grain per pound.

¹For the crop of 1931.

While these data offer no cause for concern or alarm they should not be allowed to create an attitude of complacency or of indifference. There will undoubtedly be times when unusual conditions will occur, such as the necessity for extra heavy applications of spray, or unfavorable conditions for the natural removal of the residual spray material. Up to the present time there has been no need for any extensive operations to remove spray residue to make apples marketable. In such cases as have required some treatment, removal by means of wiping has been employed. It seems timely to suggest that growers anticipate the possible necessity of spray removal on a considerable scale so that an emergency may not catch them unawares. A bulletin issued by the United States Department of Agriculture, Farmers' Bulletin No. 1687, issued in October of this year, deals with the subject of removing spray-residue from apples and pears and gives in some detail the methods of treatment that have been found to be satisfactory.

SQUASH

Twenty samples of squash were examined for total solids. The samples represented crosses between Golden Delicious and Boston Marrow varieties in connection with field experiments carried on by the Associated Seed Growers of New Haven.

Segments were cut from the stem end to the opposite end of the vegetable, the segment freed from seeds and solids determined. The samples ranged from 7.68 to 15.42 per cent of solids in the samples as received.

TOBACCO SEED

A sample of tobacco seed, Tobacco Station crop of 1930, was analyzed for the Department of Biochemistry as follows:

Water	6.87
Ash	3.31
Protein (N x 5.34)	19.33
Fiber	14.20
Carbohydrates:	
Starch	none
Water-soluble after hydrolysis calculated as dextrose	2.13
Water-insoluble after hydrolysis calculated as dextrose	1.31
Undetermined	9.75
Fat (ether extract)	43.10

MISCELLANEOUS FOODS

Thirty-six samples of foods of a miscellaneous character have been examined for health officers or other authorities and in some instances for individuals. Some of these involve only tests for the detection of common adulterants or analyses to determine proximate composition. These samples require no special discussion or comment.

DRUGS

ACETIC ACID, AND ACETIC ACID, DILUTE

Acetic acid should contain not less than 36 per cent and not more than 37 per cent of acetic acid. Seven samples were examined, two of which were substantially below standard.

Dilute acetic acid should contain not less than 5.7 per cent and not more than 6.3 per cent of acetic acid. One sample was much too strong.

TABLE 7. ASSAYS OF ACETIC ACID AND DILUTE ACETIC ACID

No.	Dealer	Acetic Acid, %
	Acetic Acid	
	<i>Hartford</i>	
48067	A. I. Genter	29.4
46394	John M. Rosenthal	35.7
	<i>Lakeville</i>	
46387	Leverty's Pharmacy	25.7
	<i>Meriden</i>	
48167	The Graber Pharmacy	36.1
	<i>Mystic</i>	
47944	Mystic Pharmacy	36.5
	<i>Stratford</i>	
47910	Onkey & Brodie	36.7
	<i>Thomaston</i>	
48155	G. A. Lemmon	36.5
	Dilute Acetic Acid	
	<i>Hartford</i>	
48365	Weaver Pharmacy	15.6 ¹
	<i>Pawcatuck</i>	
47942	Higgin's Pharmacy	7.2
	<i>Plainville</i>	
48071	Geo. R. Byington	6.3
	<i>Wallingford</i>	
48181	Wallingford Drug Co.	5.9
	<i>Willimantic</i>	
48055	Bay State Drug Co.	6.0
	<i>Winsted</i>	
48355	The Case Drug Store	5.7

¹Labelled 28 per cent.

AROMATIC SPIRITS OF AMMONIA

The formula for this article requires that the finished product contain 1.84 gms. of ammonia (NH_3), in each 100 cc. The alcoholic strength should be from 62 to 68 per cent by volume. Five samples were somewhat low in ammonia and one was notably too strong.

TABLE 8. ASSAYS OF AROMATIC SPIRITS OF AMMONIA

No.	Dealer	Ammonia, gms/100 cc	Alcohol by volume %
	Aromatic Spirits of Ammonia		
	<i>Bethel</i>		
48627	English Drug Store	1.8	65.7
	<i>Bristol</i>		
48082	Boulevard Pharmacy	1.7	63.7
	<i>Canaan</i>		
46381	The Service Pharmacy	1.8	62.2
	<i>Danielson</i>		
48095	The M. H. Berthaume Pharmacy ..	1.7	60.8
	<i>Hartford</i>		
48368	Homestead Park Pharmacy	1.2	67.7
46374	Hubert's Drug Store	1.6	65.0
48069	Ideal Drug Co.	1.7	64.8
48061	Wilmore Pharmacy	1.8	63.4
	<i>Meriden</i>		
48170	N. P. Forcier	1.9	65.2
	<i>Middletown</i>		
47922	Hartman Drug Co.	1.6	65.0
	<i>Naugatuck</i>		
47903	Naugatuck Drug Co.	1.7	64.1
48197	Olson's Drug Store	1.8	61.3
	<i>New London</i>		
48352	Main St. Pharmacy	1.2	66.4
	<i>Stafford Springs</i>		
46397	D. H. McCormick	1.5	64.8
	<i>Thompsonville</i>		
48090	Thompsonville Drug Co.	1.5	69.5
	<i>Torrington</i>		
48163	Claxton's Pharmacy	1.8	65.9
	<i>Waterbury</i>		
48378	Litsky's Pharmacy	2.7	68.2
	<i>Westport</i>		
48645	Achrons Pharmacy	1.7	65.0
	<i>Windsor</i>		
48085	Windsor Drug Co.	1.4	66.4
	<i>Winsted</i>		
48359	F. S. Bunnell	1.6	65.0

AMMONIA WATER

Ammonia water should contain not less than 9.5 and not more than 10.5 per cent by weight of ammonia (NH_3). This solution deteriorates rapidly and should be tested frequently.

Four samples were submitted, three of which were substantially below standard. The deficient samples ranged from 3.5 to 7.8 per cent ammonia and were purchased at the Parkview Pharmacy, Middletown; Bassett Pharmacy, New Milford; and the Suffield Pharmacy, Suffield.

SOLUTION OF ARSENOUS ACID

Only one sample, No. 48083, was examined and this was below standard. It was purchased at Nareck's Pharmacy, New Britain. The pharmacopoeia standard is not less than 0.975 and not more than 1.025 gm. of arsenous acid (As_2O_3), in each 100 cc of solution. The sample contained 0.817 gm.

SOLUTION OF ARSENOUS AND MERCURIC IODIDE

(Donovan's Solution)

This preparation should contain not less than 0.95 gm. and not more than 1.05 gm. of arsenous iodide (AsI_3); and not less than 0.95 gm. and not more than 1.05 gm. of mercuric iodide (HgI_2). Color should not be more than pale yellow.

Sample 48096 was purchased at Woodward Drug Store, Danielson. It was deep yellow in color, showing oxidation. There was no arsenic in the arsenous form. The sample was also mislabelled as "Solution of Arsenous Iodide."

Sample 48350 was purchased at Starr Brothers, New London. It was also decomposed by oxidation so that only about one-half of the arsenic was in the arsenous form.

In both cases the total amounts of arsenic were substantially correct, as was the mercuric iodide ingredient also. Deterioration did not occur after the samples were submitted, as analyses were made promptly.

GLYCERITE OF BISMUTH

This is a National Formulary preparation. It should contain not less than 12.5 nor more than 13.5 gms. bismuth oxide (Bi_2O_3) in each 100 cc. Two samples were examined neither of which conformed to the standard. Sample 47935, from Doudue's Drug Store in Guilford contained 7.3 gms. bismuth oxide per 100 cc; and 48626 from Northrope's Drug Store, Danbury, contained 17.7 gms.

CALCIUM GLUCONATE

This salt is used to obtain the therapeutic effects of calcium and is said to possess some advantages over calcium chloride for this purpose. The salt is described in New and Nonofficial Remedies,

page 112, 1931. H. J. Fisher of this laboratory has devised a method¹ for the assay of this salt based upon the estimation of the organic radical.

Four samples were examined; two were the pure salt and two were tablets containing 1.5 gms. each of the salt. All were products of the Sandoz Chemical Works, Basle, Switzerland. The tablets weighed averaged about 3 gms. each and contained about 50 per cent by weight of medicament.

Three samples were examined for experimental purposes.

CAMPHOR LINIMENT

Camphor liniment should yield not less than 19 per cent and not more than 21 per cent of camphor. Ten samples were examined and all were passed as satisfactory except one that contained a considerable excess of camphor.

TABLE 9. ASSAY OF CAMPHOR LINIMENT

No.	Dealer	Camphor %
48192	<i>Bloomfield</i> Nicholson's Pharmacy	20.0
48081	<i>Bristol</i> Central Drug Store	20.6
46388	<i>Hartford</i> Whitney Pharmacy	24.0
48168	<i>Meriden</i> N. P. Forcier	18.6
46399	<i>Stafford Springs</i> Wick's Drug Store	19.5
47915	<i>Stratford</i> Blank Brothers Drug Store	19.6
48161	<i>Torrington</i> Park Pharmacy	19.3
48375	<i>Waterbury</i> Higgin's & Glynn	19.9
48088	<i>Windsor Locks</i> The Bridge Pharmacy	19.2
48185	<i>Woodbury</i> Woodbury Drug Co.	19.1

OIL OF CARAWAY

H. J. FISHER

The Pharmacopoeia requires that oil of caraway contain not less than 50 per cent. by volume of carvone.

Eight samples were submitted for examination. An attempt to

¹Jour. A.O.A.C., Vol. 15, 1932.

apply the U. S. P. method of assay for carvone¹ to these samples led to results that were obviously erroneous. After experimenting with known mixtures of pure carvone and limonene, it was found that correct results could be obtained by the method of Bennett.² As we finally applied the method to oil of caraway, the procedure was as follows:

Five cc of oil of caraway were weighed in a 50 cc. volumetric flask and made to volume with alcohol. Twenty cc of this solution were mixed with 25 cc of half-normal hydroxylamine hydrochloride in 80 per cent. alcohol and 20 cc of half-normal alcoholic potassium hydroxide, and the mixture allowed to stand over night at room temperature. The next day the solution was diluted with 250 cc of water, exactly neutralized to phenolphthalein with half-normal sodium hydroxide and then titrated with half-normal sulphuric acid, using 1 cc of 0.02 per cent methyl orange as indicator. A blank was run on the reagents alone. The difference represents the amount of hydroxylamine combined with the carvone.

TABLE 10. ASSAY OF OIL OF CARAWAY

No.	Dealer	Carvone, %
49748	<i>Danbury</i> Whelan Drug Co., Inc.	56.42
49741	<i>Danielson</i> A. A. Bonneville	64.39
48059	<i>Hartford</i> Griswold Drug Co.	62.20
50050	The D. G. Stoughton Co.	52.47
48171	<i>Meriden</i> W. W. Mosher	59.26
50051	<i>New Britain</i> Noveck's Pharmacy	56.84
49747	<i>New Milford</i> H. F. Bassett	56.05
49743	<i>Norwich</i> The Lee & Osgood Co.	45.63

OIL OF CHENOPODIUM

This product should contain not less than 65 per cent of ascaridol. Only one sample was submitted, purchased at the Stoughton Drug Co., South Whitney St., Hartford.

The U.S.P. method of assay for this product is not satisfactory. The method of Cocking and Hymas, (*Analyst*, 55: 183. 1930) was used in testing this sample and 74.6 per cent of ascaridol was found.

¹U.S.P. X p. 253.

²*Analyst*, 34 : 15. 1909; *ibid.* 47 : 146. 1922

OIL OF CINNAMON

Oil of cinnamon should yield not less than 80 per cent by volume of cinnamic aldehyde. The one sample analyzed yielded 80.4 per cent. It was purchased at the Nathan Hale Drug Store, Willimantic.

TABLE II. ASSAY OF SIRUP OF FERROUS IODIDE

No.	Dealer	Ferrous Iodide gms/100 cc	Free iodine
47905	<i>Ansonia</i> Bristol Drug Co.	6.12	none
47934	<i>Branford</i> Branford Pharmacy	7.08	none
47938	<i>Clinton</i> Neal's Pharmacy	7.33	none
48619	<i>Danbury</i> George B. Betts	7.15	none
48367	<i>Hartford</i> Kufman's Pharmacy	6.60	none
46391	Malley Drug Co.	7.22	none
48363	The Stoughton Drug Co.	6.48	none
47909	<i>Shelton</i> E. J. Barden	6.76	none
48190	<i>Simsbury</i> Haffert's Pharmacy	6.94	none
48642	<i>Stamford</i> The Wm. H. Jones Drug Store	5.85	none
47912	<i>Stratford</i> W. H. St. John & Co.	6.93	none
48153	<i>Terryville</i> Pelchard's Pharmacy	6.45	none
48092	<i>Thompsonville</i> Steel's Corner Drug Store	7.19	none
48162	<i>Torrington</i> Claxton's Pharmacy	21.94	none
48158	North End Pharmacy	6.64	none
48165	Opperman's Drug Store	6.96	none
48178	<i>Wallingford</i> F. W. Marx	6.81	none
48373	<i>Waterbury</i> Ebbs Drug Co.	7.29	none
48381	<i>Watertown</i> Post Office Drug Store	6.93	none
48051	<i>Willimantic</i> Curran & Flynn	6.59	none
48053	The Wilson Drug Co.	6.82	none
48354	<i>Winsted</i> The Case Drug Store	7.05	none

OIL OF CLOVES

Oil of cloves should yield not less than 82 per cent by volume of eugenol.

Three samples were tested and found satisfactory. They were purchased at Delmonica's Drug Shoppe, Stafford Springs; Monroe's Pharmacy, Madison; and Suffield Pharmacy, Suffield, and contained 86 per cent, 87.3 per cent, and 87.8 per cent of eugenol, in the order named.

SIRUP OF FERROUS IODIDE

This preparation should contain not less than 6.5 gm. and not more than 7.5 gm. of ferrous iodide.

Twenty-two samples were examined and all were passed except one sample that was found to be much too strong. (See Table 11).

TINCTURE OF FERRIC CITROCHLORIDE

This preparation is listed in the National Formulary and should contain not less than 4.48 gm. of iron (Fe), in each 100 cc.

Eight samples were submitted, one of which, No. 48098, however, was tincture of ferric chloride and so marked, evidently dispensed under a misunderstanding as to the article called for. Seven samples were found to conform substantially to the standard.

TABLE 12. ASSAY OF TINCTURE OF FERRIC CITROCHLORIDE

No.	Dealer	Iron, Fe gm/100 cc
	<i>Bristol</i>	
48074	The Holley Pharmacy	4.8
	<i>East Haven</i>	
47930	Metcalf's Drug Store	4.4
	<i>Meriden</i>	
48176	Broderick & Curtin	4.3
	<i>Middletown</i>	
47921	Whalen Drug Co.	4.6
	<i>Putnam</i>	
48099	Edward H. Burt	5.6
	<i>Torrington</i>	
48157	South End Pharmacy	4.5
48164	Webb & Siegel	4.1

SOLUTION OF FERRIC SULFATE

Solution of ferric sulfate should contain not less than 9.5 nor more than 10.5 per cent of iron (Fe).

Only two samples were submitted both of which met the requirements of the standard. They were purchased at Cronin's Drug Store and at Liggett's, both in Middletown.

DILUTED HYDROCHLORIC ACID

Hydrochloric acid, dilute, should contain not less than 9.5 and not more than 10.5 per cent of hydrochloric acid, (HCl).

Twenty-two samples were tested of which one was much too weak and five were more than 10 per cent in excess of the upper limit specified in the standard.

TABLE 13. ASSAY OF DILUTED HYDROCHLORIC ACID

No.	Dealer	HCl %
47933	<i>Branford</i> The Spaulding Co.	10.3
48077	<i>Bristol</i> L. P. Tucker	10.7
47907	<i>Derby</i> Harding Drug Store	10.9
47916	<i>Devon</i> Maillard Drug Co.	11.6
48072	<i>Forestville</i> Kent's Pharmacy	9.9
48364	<i>Hartford</i> Henry C. Kottenhoff	11.1
48063	Roosevelt Drug Co.	2.9
46393	John M. Rosenthal	11.2
48172	<i>Meriden</i> V. W. Schmelzer	11.9
48196	<i>Naugatuck</i> John J. Levy	11.2
48184	<i>North Woodbury</i> H. H. Canfield	9.7
47904	<i>Seymour</i> George Smith & Son	10.9
48382	<i>Sharon</i> Clarence H. Eggleston	9.2
46396	<i>Stafford Springs</i> D. H. McCormick	11.3
47914	<i>Stratford</i> Hamilton's Pharmacy	10.8
48193	<i>Union City</i> Union City Pharmacy	11.6
48371	<i>Waterbury</i> W. J. Dunphy	12.0
48646	<i>Westport</i> The Westport Drug Co.	9.8
48057	<i>Willimantic</i> Wilson's Windham Pharmacy	10.9
48089	<i>Windsor Locks</i> R. J. Keef	12.7
48358	<i>Winsted</i> Bannon's Drug Store	11.8
48357	Opera House Pharmacy	11.7

TINCTURE OF IODINE

This preparation should contain not less than 6.5 gms. and not more than 7.5 gms. of iodine and not less than 4.5 gms. and not more than 5.5 gms. of potassium iodide in each 100 cc of solution.

The one sample tested was satisfactory. It was purchased at Hubert's Drug Store, Zion Street, Hartford.

TABLE 14. ASSAY OF SOLUTION OF MAGNESIUM CITRATE

No.	Dealer	Free citric acid gms/100 cc	Total citric acid gms/100 cc	Magnesium oxide gms/100 cc
	Standard	3.3	9.8	1.5
47906	<i>Ansonia</i> McQuade's Drug Store ...	2.7	8.8	1.6
47931	<i>Branford</i> William's Drug Store	3.8	10.0	1.7
48079	<i>Bristol</i> Rickman's Drug Store	2.8	9.0	1.7
46380	<i>Canaan</i> The Service Pharmacy	3.8	9.5	1.6
48625	<i>Danbury</i> Culhane's Drug Store	2.4	8.4	1.7
48152	<i>East Hartford</i> Prospect Pharmacy	2.5	6.9	1.2
46392	<i>Hartford</i> Acme Pharmacy	4.3	10.1	1.7
48060	Griswold Drug Co.	2.2	7.2	1.3
48068	Ideal Drug Co.	1.7	6.7	1.3
47948	<i>New London</i> Nichols & Harris	2.9	8.4	1.5
47949	Starr Brothers, Inc.	3.4	9.5	1.7
46379	<i>Norfolk</i> G. T. Johnson Drug Co. ...	4.1	10.0	1.7
48151	<i>Putnam</i> James T. Donahue	1.4	5.3	1.1
46386	<i>Salisbury</i> Salisbury Pharmacy	3.8	9.2	1.6
48159	<i>Torrington</i> North End Pharmacy	3.2	7.0	1.3
48160	Park Pharmacy	1.9	6.9	1.4
48182	<i>Wallingford</i> W. P. Lynch	1.3	5.2	1.1
48179	Moran's Drug Store	0.7	5.6	1.4
48180	Wallingford Drug Co.	1.9	6.0	1.1
48372	<i>Waterbury</i> W. J. Dunphy	2.0	6.6	1.3
48374	Nitkin's Pharmacy	2.0	6.6	1.3
48376	Frederick Siracusa	2.1	7.5	1.5
48370	Up-Town Apothecary	3.0	8.6	1.6
48087	<i>Windsor</i> Parson's Drug Store	3.6	9.5	1.6
48084	Prouty's Pharmacy	4.0	9.8	1.7
48356	<i>Winsted</i> The City Pharmacy	2.3	6.3	1.1

REDUCED IRON

This product should contain not less than 90 per cent of metallic iron. All of the four samples tested met, or exceeded, this requirement except one sample obtained at Monroe's Pharmacy, Guilford, which tested 84 per cent. The other samples were obtained at the Bacon Drug Co. and Roosevelt Drug Co., Hartford; and Onkie and Brodie, Stratford.

TABLE 15. ASSAY OF AMMONIATED MERCURY

No.	Dealer	Mercury Hg %
	<i>Bridgeport</i>	
48630	S. Schim's Pharmacy	78.6
	<i>Canaan</i>	
46382	Freeman Dempsey	78.6
	<i>Deep River</i>	
47941	LaPlace Pharmacy	78.7
	<i>East Hampton</i>	
47924	Burton Drug Co.	79.3
	<i>Hartford</i>	
48062	Witmore Pharmacy	79.4
	<i>New Hartford</i>	
48353	Marble's Pharmacy	78.8
	<i>Oakville</i>	
48380	Byrne's Drug Co.	78.5
	<i>Plainville</i>	
48070	Plainville Pharmacy	78.4
	<i>Putnam</i>	
48150	Edward N. Burt	78.6
	<i>Terryville</i>	
48154	The Cook Pharmacy	78.2
	<i>Union City</i>	
48194	Union City Pharmacy	79.7
	<i>Willimantic</i>	
48054	Bay State Drug Co.	79.3

SOLUTION OF MAGNESIUM CITRATE

The major requirement for this preparation is that it contain magnesium citrate equivalent to not less than 1.5 gms. of magnesium oxide in each 100 cc. The specifications further provide limits for free citric acid and for total citric acid which calculate to 3.3 gms. and 9.8 gms. respectively in each 100 cc.

Of 26 samples examined seven contained less than 90 per cent of the required equivalent of magnesium oxide. There were in all 14 that did not meet the specifications with respect to all of the specifications above noted. (See Table 14).

We have made a solution of magnesium citrate in the laboratory according to the directions as given in the pharmacopoeia and found it to conform to the specifications given and there is no apparent reason why pharmacists should have difficulty in meeting those specifications, at least within a reasonable tolerance.

AMMONIATED MERCURY

This preparation is mercurammonium chloride and should contain not less than 78 per cent and not more than 80 per cent of mercury (Hg).

Twelve samples were examined and all satisfied the requirements of the standard. (See Table 15).

MERCURY WITH CHALK

Mercury with chalk should contain not less than 37 per cent and not more than 39 per cent of mercury (Hg).

The four samples examined substantially met these requirements. The samples were obtained at Pond's Drug Store, Essex; V. W. Schmelzer, Meriden; Finch's Drug Store, Greenwich; and J. J. O'Connor, Westport.

SPIRIT OF NITROUS ETHER

This article should contain not less than 3.5 per cent and not more than 4.5 per cent of ethyl nitrite.

The Pharmacopoeia cautions that stock of this solution be stored in small, well-stoppered, dark-colored bottles in a cool, dark place remote from fire. Failure to observe this precaution is no doubt largely responsible for the sub-standard samples found in inspection. (See Table 16).

Seventeen samples were tested, of which seven were deficient.

NITROHYDROCHLORIC ACID, DILUTED

There are no numerical standards for this National Formulary article, but it is noted that it must act immediately upon potassium iodide solution, liberating iodine. Only one of the samples examined turned potassium iodide solution visibly yellow, although all gave a blue color when starch was added.

It was found by experiment that if diluted nitrohydrochloric acid were prepared according to the National Formulary, there was practically no effervescence on mixing the concentrated acids, and unless this mixture was warmed till effervescence began before diluting, the resulting diluted acid gave only a barely perceptible

yellow color to potassium iodide solution. If the concentrated acid mixture was warmed till effervescence began and then allowed to stand till it ceased before dilution, the diluted acid so prepared gave a pronounced yellow color with potassium iodide solution.

The purchased samples may have been properly prepared in the first place, but none except 48052 pass the N. F. test at present. This may be due to deterioration on keeping, however.

In view of the fact that the directions in the National Formulary for making this preparation could well be made more explicit we have not classed those samples as sub-standard.

TABLE 16. ASSAY OF SPIRIT OF NITROUS ETHER

No.	Dealer	Ethyl nitrite %
	<i>Bristol</i>	
48076	L. P. Tucker	3.0
	<i>Canaan</i>	
46384	Farnum's Drug Store	5.0
	<i>Hartford</i>	
46375	Hubert's Drug Store	4.5
48369	L. J. Madsen & Co.	3.3
	<i>Milford</i>	
47917	John T. Hawes	3.5
	<i>New London</i>	
48351	Whelan Drug Co.	2.4
	<i>New Milford</i>	
48187	H. F. Bassett	4.7
48186	Park Drug Store	2.6
	<i>Oakville</i>	
48379	The Spooner Drug Co.	3.6
	<i>Salisbury</i>	
46385	Salisbury Pharmacy	3.4
	<i>Shelton</i>	
47908	Fred S. Sanford	4.2
	<i>Stafford Springs</i>	
46398	Wick's Drug Store	2.9
	<i>Stamford</i>	
48643	The Lawrence Drug Store	2.2
	<i>Stratford</i>	
47913	Sear's Pharmacy	4.1
	<i>Tariffville</i>	
48191	O'Connor's Drug Store	2.3
	<i>Waterbury</i>	
48377	The W. H. Pickett Drug Co.	2.2
	<i>Windsor</i>	
48086	Paxsone Drug Store	4.3

DILUTED PHOSPHORIC ACID

Diluted phosphoric acid should contain not less than 9.5 and not more than 10.5 per cent of phosphoric acid.

Nine samples were tested and two were found to be about 50 per cent too strong, probably due to the fact that the dilution was made on the basis of volume rather than weight.

TABLE 17. ASSAY OF DILUTED PHOSPHORIC ACID

No.	Dealer	Phosphoric acid %
	<i>Bristol</i>	
48080	Central Drug Co.	10.7
	<i>Collinsville</i>	
48361	Valley Pharmacy	10.5
	<i>Danbury</i>	
48623	Whelan Drug Co.	16.6
	<i>Hartford</i>	
48066	F. H. Griswold	16.0
	<i>Meriden</i>	
48174	V. W. Schmelzer	10.5
	<i>Naugatuck</i>	
48198	Albert R. Adams	10.6
48199	Park's Drug Co.	10.3
	<i>New London</i>	
47947	Nichols & Harris	10.9
	<i>Westbrook</i>	
47939	Westbrook Pharmacy	10.3

SATURATED SOLUTION OF POTASSIUM IODIDE

The amount of this salt that a saturated solution will contain depends upon the temperature at which the solution is made. A solution saturated at 25° C should contain 59.7 per cent of potassium iodide; if saturated at 0° C only 56 per cent would be present. At ordinary room temperature, 20° C, a saturated solution should contain 59.0 per cent. On this basis three of the five samples examined were passed. One was only 82.5 per cent saturated and another was 88.5 per cent.

TABLE 18. ASSAY OF SATURATED SOLUTION OF POTASSIUM IODIDE

No.	Dealer	Degree of saturation %
	<i>Collinsville</i>	
48360	McNamara's Pharmacy	88.5
	<i>East Hampton</i>	
47923	Chatham Pharmacy	99.7
	<i>Meriden</i>	
48177	R. M. Lynch	82.5
	<i>New Haven</i>	
47925	Wood's Drug Store	99.4
	<i>Thompsonville</i>	
48091	Steel's Corner Drug Store	98.1

DILUTED SULPHURIC ACID

This solution should contain not less than 9.5 percent, nor more than 10.5 percent of sulphuric acid. Only four of the eight samples tested were satisfactory. One of the deficient samples was less than half-strength; the others were about 50 percent or more too

TABLE 19. ASSAY OF DILUTE SULPHURIC ACID

No.	Dealer	Sulphuric acid %
48624	<i>Danbury</i> Whelan Drug Co.	15.5
48097	<i>Danielson</i> Woodward Drug Store	10.8
48366	<i>Hartford</i> Deerfield Pharmacy	16.0
48065	T. H. Griswold	17.5
48173	<i>Meriden</i> V. W. Schmelzer	10.1
47945	<i>Mystic</i> Knox Pharmacy	11.3
48195	<i>Naugatuck</i> John J. Leary	4.0
47946	<i>New London</i> Nichols & Harris	10.6

strong. The explanation of over-strength is probably the same as that given in the case of dilute phosphoric acid. Since a given volume of sulphuric or phosphoric acids weighs 1.8, or 1.7 respectively times as much as an equal volume of water, it is evident that when the stronger acids are measured instead of weighed the dilutions will be too strong. The pharmacopoeia directs in both cases that weights of acids be taken.

TABLE 20. ASSAY OF THYMOL IODIDE

No.	Dealer	Iodine %
46383	<i>Canaan</i> Freeman Dempsey	47.5
47918	<i>Middletown</i> Pelton's Pharmacy	42.2
48189	<i>Simsbury</i> The Lathrop Pharmacy	46.8
48156	<i>Thomaston</i> Doyle's Drug Store	47.6
48166	<i>Torrington</i> Thurlough's Pharmacy	47.1
48050	<i>Willimantic</i> Curran & Flynn	47.5

TABLE 21. ANALYSES OF TURPENTINE

No.	Dealer	Place of sampling	Specific gravity at 15.5° C	Refractive index at 20° C	Unpolymerized residue, per cent by volume	Initial B. P. at ° C	Distilling below 170° C per cent
49708	Atwell Bros.	..... Durham	0.9	1.5	1.9	146.0	82.5
49731	Butler's Hardware Store	..... Guilford	0.9	1.5	1.2	153.0	92.6
49711	City Hardware Co.	..... Bristol	0.9	1.5	1.4	148.0	93.0
49712	City Hardware Co.	..... Middletown	0.9	1.5	1.8	154.0	96.5
49734	The Darrow & Comstock Co.	..... New London	0.9	1.5	1.7	154.0	97.1
49732	H. S. Davis	..... Guilford	0.9	1.5	1.2	155.0	94.5
49740	Dickerman Hardware & Supply Co.	..... Wallingford	0.9	1.5	2.0	153.0	96.4
49721	The Fairfield Hardware Co.	..... Fairfield	0.9	1.5	1.9	150.0	97.1
49726	Franklyn Hardware Co.	..... Norwich	0.9	1.5	1.6	155.0	98.2
49713	The Harley-Giant Co.	..... Willimantic	0.9	1.5	4.7	146.0	94.0
49709	Johnson Bros.	..... Northford	0.9	1.5	2.5	157.0	94.4
49714	The Jordan Hardware Co.	..... Willimantic	0.9	1.5	4.7	155.0	94.5
49744	The Lee & Osgood Co.	..... Norwich	0.9	1.5	2.0	152.0	95.8
49739	Lovell & Co.	..... Stratford	0.9	1.5	3.5	151.0	91.3
49735	C. H. Mather & Co.	..... Essex	0.9	1.5	2.2	150.0	95.3
49742	A. E. Meech	..... Danielson	0.9	1.5	1.9	155.0	97.5
49720	The Norwalk Hardware Co.	..... Norwalk	0.9	1.5	1.6	157.0	97.0
50669	Quality Paint Stores	..... New Haven	0.9	1.5	1.6	150.0	97.2
49736	Seymour Hardware & Supply Co.	..... Seymour	0.9	1.5	1.6	150.0	84.8
49710	E. J. Smith Hardware Co.	..... Collinsville	0.9	1.5	2.1	79.0	93.0
49737	J. J. Tomko	..... Shelton	0.9	1.5	1.8	154.0	96.2
49728	Valley Hardware Co.	..... Derby	0.9	1.5	1.7	152.0	94.2
49749	Westport Hardware Co.	..... Westport	0.9	1.5	2.1	152.0	98.5
49733	George Williams Co.	..... New London	0.9	1.5	1.8	155.0	97.6

probably the explanation for samples 49708 and 49736 in which less than 90 per cent was found to distill below the temperature specified. In five samples the unpolymerized residue exceeded the limits of the specifications, in three cases by substantial amounts. One sample, 49710, was adulterated with some low-boiling substance. A later sample from the same distributor, but not from the same lot, was satisfactory.

MISCELLANEOUS DRUGS

Fifteen samples in this group have been submitted. Several of these may be noted, but most of them require no comment.

46686. *Insoloid tablets*. This remedy was offered under false and misleading claims as a treatment for diabetes.

The composition was indicated by the label as follows: "Syzyg., myrtill., Faex med. lecithin ex ovo, calcium oxide, Sp. Pancreatinin."

Syzygium Jambolana, common name jambul, is described in the United States Dispensatory and was once used in the treatment of diabetes because its administration to phloridzinized dogs reduced excretion of sugar. Nowadays, however, phloridzin glycosuria is not recognized as allied to true diabetes and the value of jambul in this connection does not appear to be established.

Faex medicinalis is another name for yeast.

Myrtillin was at one time thought to have possibilities in the treatment of diabetes, but it did not meet expectations. A discussion of this drug appears in the Journal of the American Medical Association for November 5, 1927, page 1577.

Pancreatin is a recognized U. S. P. preparation but we find no official preparation under the name of "pancreatinin."

Advertising literature called attention to the objectionable features of injected insulin and proposed the substitution of insoloid tablets, taken by mouth. It was recommended that the change in treatment be under the direction of a physician, particularly in the case of child patients.

Analysis of the product is as follows:

Moisture 5.14 per cent; nitrogen 2.90; lipoids 3.68; lipid P_2O_5 0.051; lecithin (estimated) 0.56; sucrose 15.49; total sugars 17.63; total ash 22.11; calcium oxide 6.32; magnesium oxide 0.87; total P_2O_5 0.93. Amylolytic activity about 1 per cent of that of U. S. P. pancreatin. Proteolytic activity greater than 0.1 of, but not equal to, that of U. S. P. pancreatin.

49707. *Electrovita artificial mineral water*. Electrovita Company, Inc., Norwalk, Ohio. This is a moderately alkaline mineral water as stated on the label. The name is of the patent medicine type. No collateral advertising was submitted with the sample and we have seen none. However, references to such advertising, particularly in the Journal of the American Medical Association,

Jan. 23, 1932, indicate that exaggerated and unwarranted claims have been made in promoting this product.

Analysis of the water is as follows:

Volatile solids, p.p.m. 57; total solids 1,046; phenolphthalein alkalinity as CaCO_3 953; methyl orange alkalinity as CaCO_3 988; hydroxide 278; carbonate 42; silica (SiO_2) 2.3; iron and aluminium oxides 1.3; calcium (Ca) 403; magnesium (Mg) 0.0; sodium (Na) 9.9; potassium (K) 3.9; chloride (Cl) 39.0; sulphate (SO_4) 88.0; phosphate (PO_4) 0.0.

A solution practically equivalent to this could be made by mixing two parts of lime water with three parts of tap water.

46883. *Kruschen salts*. This was a preparation consisting essentially of a mixture of Epsom and Glauber salts. The calculated composition is as follows:

MgO 1.36 per cent; $\text{MgSO}_4 \cdot \text{H}_2\text{O}$ 62.26 per cent; $\text{Na}_2\text{SO}_4 \cdot 10 \text{H}_2\text{O}$ 20.59 per cent; NaCl 6.25; KCl 4.55 per cent; Fe_2O_3 , trace; moisture, in excess of water of crystallization, 4.99 per cent.

MATERIALS EXAMINED FOR POISONS

C. E. SHEPARD and E. M. BAILEY

The laboratory is frequently called upon to examine specimens such as fodders, bait, and animal organs in connection with suspected poisoning, chiefly in cases involving the sickness or death of domestic animals. Because of the time and attention required to make the necessary chemical examinations and the further investigation of circumstances sometimes advisable the Station is reluctant to undertake such work unless the results, if positive, are likely to be useful as evidence in court or as a basis for other corrective action. Our experience has been that to secure convictions in court it is practically necessary to have witnesses to the actual distribution of poison or to its administration to animals, and such evidence is in most cases impossible to secure. In some instances, however, the results of chemical analysis serve to remove suspicions on the part of the owners of animals thought to have been poisoned, or to enable them to take proper precautions against further trouble and thus our labor is not entirely lost.

The finding of poison does not necessarily support a theory of malicious intent. Arsenic when associated with copper or lead is quite likely to be explained by accidental causes, such as access to spray materials. Lead alone suggests that animals have had access to paint materials or have licked freshly painted surfaces. Strychnine, yellow phosphorus, and cyanide are more likely to be the result of willful poisoning. Often the most careful search fails to reveal anything that can be advanced as a probable cause of

death. This may be due to failure to detect obscure poisons, but it is equally possible that disease may have been the cause. In many instances veterinarians have not made autopsies of the animals, or if they have done so, time has elapsed since the animal died, so that diagnosis is difficult. As for poisonous principles obtained from forage plants the isolation of such from animal body tissues and secretions in a state of sufficient purity for identification is difficult and sometimes impossible. In some cases brought to our attention pastures have been searched for plants known to be poisonous to stock. In a few instances our chemical examinations have been supplemented by bacteriological examinations made possible by laboratories equipped for such work. Acknowledgment is due to the laboratories of the State Board of Health and of the Yale University School of Medicine for their helpful cooperation and courtesy.

From 1917 to 1931 inclusive, a total of 190 cases have been investigated (involving 265 specimens) and conclusive evidence of poison found in 78 cases, or 41 per cent, of the total number. Sixty-two samples have been examined during the past year.

BABCOCK GLASSWARE AND THERMOMETERS

The Statutes require this Station to check the calibration of glassware used in the testing of milk and cream and also to check thermometers used in the control of the pasteurization of milk. The accompanying table summarizes the work done in this Department during the past year:

Article	Total	Accurate	Inaccurate	Broken
Milk test bottles	1895	1893	1	1
Cream test bottles	262	261	0	1
Skim milk test bottles	39	32	5	2
Milk pipettes	410	403	0	7
Thermometers	114	112	0	2
	<hr/>	<hr/>	<hr/>	<hr/>
Totals	2720	2701	6	13

The number "broken" does not necessarily mean broken in testing. In most cases it means broken in transit to the laboratory.

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