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Editorials

The opinions and ideas expressed in papers and editorials are those of the respective authors. The expressions of the Association are completely recorded in the transactions.

Message of the President

SINCE it has become the practice of the INTERNATIONAL ASSOCIATION OF MILK SANITARIANS to dispense with a presidential address at Annual Meetings, the first number of the JOURNAL in the year of his administration has come to be the vehicle for a message from him to the membership.

C. A. ABELE, B.S., CH.E.
President, International Association of Milk Sanitarians

In a period of patriotically inspired conservation of print paper, labor, and time it is most appropriate that this message be brief.

It is not becoming that an officer entering upon a term of duty should review known events of the recent past, nor that he should make numerous promises concerning the outcome of the projects to be undertaken during his administration. Therefore, this message is limited in this respect to the factual statement that sufficient progress has been made in the organization of standing and special committees, as this is written, to assure that committee activities will have been formulated and begun by the time this communication is in print; that at least one request for affiliation will be in the hands of the Secretary; and that other matters of concern to the Association are receiving prompt attention as they arise. The only promise I make is that the progress of the affairs of the Association will be made known to the membership with as little delay as possible, in the pages of the JOURNAL.

The JOURNAL, incidentally, is

the property of the Association, in which each and every member has a share—and for the success of which he bears a corresponding responsibility. The Editor and the Manager—in the selection of whom the Association has been most fortunate—merely carry on the detailed work incident to regular publication. We can—and must—all help to make the JOURNAL even more valuable as a vehicle for the dissemination of new findings in the science of milk quality control by contributing papers, by submitting to the Editor views on controversial subjects, and by initiating, for the Manager, negotiations for advertising contracts.

It is hardly possible for any one member—even the President— to be personally acquainted with each of the other 1,200 or more members. That fact should be permitted to deter no member from addressing a personal letter to me about any matter to the interest of the Association. It is my desire to be YOUR president—individually, as well as collectively, and to that end I shall devote my energies throughout my term.

This number of the JOURNAL reaches you rather late for the customary New Year Greetings. Nevertheless, it is the first opportunity for such greetings, and I take it to express the wish that you may all enjoy, during 1943, the fulfilment of your rosiest dreams—for your personal health, happiness, or advancement, for the success of your work, and for the Association.

C. A. ABELE,
President.

Biographical Sketch

C. A. ABELE

Native of Allentown, Penn. Born July 11, 1890. Family moved to Birmingham, Ala., late in 1905. Attended high school there, worked in blast furnace and steel mill laboratories, and entered the University of Alabama in 1909. Obtained the degree of Chemical Engineer in 1914. The war depression in the steel industry in 1914–15 made it necessary to seek employment in another field than iron and steel chemistry. Became district sanitary inspector for several coal mining settlements of the Tennessee Coal, Iron, and R. R. Co., in the Birmingham district, in April, 1915.

Matriculated in the Harvard Medical School—Harvard College—Massachusetts Institute of Technology School for Health Officers for the 1916–17 school year; studied public health and sanitation there under W. T. Sedgewick, Samuel C. Prescott, Selskar Gunn, Claire Turner, M. P. Horwood, George C. Whipple, Dr. M. J. Rosenau, and others.

Participated in the food poisoning studies sponsored by the National Canners' Association, at Harvard Medical School, during the summer of 1917. Resigned to accept the position of chief inspector in the American Red Cross Extra-Cantonment Sanitation Unit for Camp McClellan, at Anniston, Ala., Sept. 1, 1917 to June 30, 1918. Scientific Assistant, U. S. Public Health Service, July 1, 1918 to October, 1919; during this period assigned to the Mississippi State Health Department during the influenza epidemic, and subsequently to organize the Bureau of Venereal Disease Control.

Left the service to become director of the Bureau of Inspection of the Alabama State Department of Health, in October, 1919. During the twenty-year connection there developed eating establishment, bakery, carbonated beverage bottling plant, ice cream plant, shell-fish, and other food plant sanitation throughout the state, through county health departments.

Was associated with Sanitary Engineer Leslie C. Frank in the formulation and initial application of the U. S. Public Health Service Milk Ordinance, which had been adopted and was being enforced in more than 50 Alabama communities by the close of 1939.

Accepted the civil service position of director of the Country Dairy Inspection Section of the Chicago Health Department, early in 1940. Responsible here for the sanitation of more than 17,000 dairy farms and 98 country receiving stations located in four states, and for the sanitary quality of the milk delivered therefrom.

Member of the International Association of Milk Sanitarians since 1923. Fellow of the American Public Health Association. Member of the Committee on Milk, of the American Child Health Conference, 1931. Member of the U. S. Public Health Service Sanitation Advisory Board from its organization until its recent reorganization. Referee on the Committee on Standard Methods for the Examination of Dairy Products, 1937–39. Chairman of a subcommittee of the Standard Methods Committee, to study the methylene-blue test procedure. Member and chairman of a number of committees of the Association during the last decade.

Affiliations

ELSEWHERE in this issue (1), we print the action of the International Association of Milk Sanitarians, taken at St. Louis, regarding the matter of affiliations. At the Jacksonville meeting, a constitutional amendment was voted to authorize the Association to effectuate an affiliate relation with local organizations of milk inspectors or to set up regional chapters. After a great deal of deliberation, a plan has been authorized. Already one group has applied for such membership.

A long time ago, man learned that in union there is strength. He does not want this union to pin his ears back, grease him, and swallow him whole but he does want enough tie to his professional colleagues to bring him the benefits of their assistance of one kind or another, and at the same time allow him reasonable freedom of action in local situations.

This assistance already has asserted itself in several important particulars. In the first place, it makes possible the annual meeting of the parent organization. For many years it has functioned to bring together milk sanitarians and technologists from scattered areas all over the country. It furnished the inspiration and model for practically all, if not all, of the present state organizations.

Moreover, the backing of the profession and the related industry makes possible the publication of this JOURNAL. Its usefulness is attested by its continual growth. Then too, its services to furnish technical and representative information in the formulation of a stream-lined, war-emergency, milk-control code (now under way) is made widely effective by the fact that the collaborators are all members of this Association. To this we add: the presentations to the military and the national Congress concerning the official recognition of milk sanitarians; the collaboration with the Industrial Association of Milk Dealers, the International Association of Ice Cream Manufacturers, and the Dairy Industries Supply Association to formulate the 4-Association Standards for dairy equipment; the establishment of a dairy scholarship, now under considera-

1. See page 55.

tion; and the sponsoring of local associations of milk sanitarians. It would elevate the prestige of milk sanitarians in their respective communities; it would further publicize the work of milk quality control and engender interest where none now exists; it would furnish a working nucleus which would serve as a rallying center to all local milk sanitarians; it would help the local inspectors to be vocal and to express their ideas on any public measure in which they are interested; it would enhance their professional standing; and it would contribute to their employment stability by reason of the combined influence of their fellow members.

Just as the individual milk sanitarian wants to receive help and assistance, he also expects to render some. The collaboration, in order to be stable, must be two-way. The group must benefit as well as the individual.

And so, as the ways and means are now provided for the International Association of Milk Sanitarians to "brood" smaller, more local groups, the obligation rests heavily on it to give service. It must not amble along, so to speak, just doing the obvious, holding its annual meeting for the favored few who can attend and who are able to pick "the crumbs that fall from the rich man's table." It must be alert to fight for its members' interest, it must seek out ways and means to help them on many counts, and last and most important of all, it must develop along lines that serve the public interest. Peace has her victories no less than war, and in this larger organization, it can more effectively than now serve in both.

J. H. S.

Milk Sanitarians: Their Professional Recognition

THE supervision of milk supplies for the Army is a duty of sanitary engineers and veterinarians. Milk sanitarians, unable to qualify as either of these professions, have no standing in the field of their training and experience. Even when they enlist they are not allowed to do milk control work. See letters on page 60.

Milk sanitarians are not given the recognition afforded female dieticians. The U. S. House of Representatives passed a bill on November 17 providing that "such personnel shall have relative rank and receive pay and allowances . . . as now or hereafter provided by law for commissioned officers, without dependents, of the Regular Army. . . ." Favorable action was expected in the Senate where it was referred to the Committee on Military Affairs on November 25.

We hear that the Quartermaster Corps is experiencing more difficulty in securing satisfactory supplies of milk than in procuring any other product. The "pre-view" echoes of the new stream-lined milk control program are placing an increased emphasis on milk plant technology. It is one for which the milk sanitarian is peculiarly qualified to handle. And yet the Veterinary Corps cannot use such men except as enlisted men detailed to serve as assistants to veterinary officers.

Many of these officer-rejects are college-trained men. They have taken dairy science courses in some of the leading colleges and universities. Some hold graduate degrees. Fit material for commissions? No. They are considered by the Army as on a par with mechanics, typists, and orderlies.

A well-known milk control officer sends us the following list of men that he has lost, all experienced and technically trained milk specialists (except one who specialized in milk technology) and the military service to which they are assigned:

Lieut. Colonel ———, Sanitary Corps
Lieut. Colonel ———, Artillery
Major ———, Sanitary Corps
Ensign ———, Navy
Lieut. ———, Infantry
Lieut. ———, Air Force
Ensign ———, Navy

Even those in the Sanitary Corps are not permitted to do milk work because they are not veterinarians. They do mosquito and water supply control (a sanitary engineer's job).

A highly trained, successful milk-control technologist offered his services to the Veterinary Corps as a milk specialist. He was informed that they could not use him unless it transpired that more milk specialists were needed after all reserve veterinary officers (some thousands) had been drafted. An appeal to the Surgeon General landed the problem into the Sanitary Corps. They received the application in a considerate manner but offered only a laboratory job with the rank of captain, perhaps major.

Mr. C. J. Babcock, ertswhile in Mr. Ernest Kelly's Office of Milk Investigations, has been appointed to the office of the Surgeon General with the rank of major. We hope that the military will be impressed with the waste of assigning trained milk technologists to the artillery and the navy and the air, and then giving short, stream-lined milk control courses to veterinary officers. The depleted health department staffs must be manned by untrained personnel, and yet these latter are the very ones that many quartermaster units depend on to supervise the local milk supply for the troops. No, no, Pauline, it just doesn't make sense.

We scarcely blame the military for not recognizing the professional status and the special qualifications of milk sanitarians. There is no generally recognized educational or professional standard for such personnel. A year or so ago, the INTERNATIONAL ASSOCIATION OF MILK SANITARIANS appointed a committee to report on this subject but its negative report seems to have been considered the final word. If we ourselves are not "sold" on the technical qualifications of what constitutes a milk sanitarian, we certainly cannot expect outsiders to believe in us. Why should others believe in us more than we believe in ourselves? It is certainly logical for the military to suppose that if "short courses" and seminars of technical instruction can be given profitably to experienced milk inspectors (as is being increasingly done over the country by health departments and state colleges), then such courses would seem to be adequate to give to veterinary officers to make them into effective milk sanitarians. We know that the latter is a fallacy. An efficient milk sanitarian cannot be made over-night—nor by an intensified stream-lined course. Such courses are important to orient him as "to what it is all about". They serve to inform him as to what he has to learn, particularly to assimilate, and especially to interpret. Application and experience are the final words. The exigencies of war are not the proper occasion to educate men in the involved technique of checking a milk plant's performance. The Army does well to give such special courses to its officers. It would do better also to recognize the special qualifications of men who have forgotten more than the instructors know—men who know the intricacies of steam, milk, and electric lines, just as well as others know veins and arteries—men who can analyze a milk production problem as well as others can diagnose a diseased cow—men who can show a plant operator how to change his practices to produce a satisfactory product as well as others can to clean up a diseased herd—yes, and more: men who have a perspective over the milk industry which enables them to think constructively and remedially in encountering the hundred and one different conditions that are not found in the book.

J. H. S.

Oklahoma Joins Journal Family

SOME one has sagely remarked that a man is known by the company he keeps. What is true for a man is applicable to organizations. When the milk inspectors of a state form an association of milk sanitarians, it shows that there is a live wire among many, and that milk inspection in that area is not just a colorless, monotonous, deadening routine. It shows that men are alive to the developing character of milk inspection. Such men are usually capable of contributing to advancing knowledge. Already, one of our vice-presidents represents that great area. Oklahoma, since your objectives and ours go along together, here's our hand.

J. H. S.

News From Our Service Colleagues

MANY of our associates in milk inspection are serving directly with the colors. They are scattered far and wide. Some noble ones will not return. News from or about any will be welcome in these columns. If you know of anyone who has "joined up", write this editor. You who are in the Service will favor us if you will tell us where you are and what you are doing (insofar as the censor will permit). Others want to know about you just as you want to know about them. Maybe some of our colleagues are in your very camp. So let's hear from you.

J. H. S.

Situations Wanted

AN employment information service will be afforded any member of the INTERNATIONAL ASSOCIATION OF MILK SANITARIANS, without charge to him. Sometimes, for one reason or another, a milk sanitarian desires to acquaint the profession that his services are available. He may be temporarily out of employment, or he may want to make a change for any number of reasons. We do not specify how many lines the card must run, but we shall allow a reasonable number, enough to tell the story. All communications will be held confidential and will be published under a box number.

A similar service is extended to our members and associated organizations who want to contact perspective applicants for "Situation Vacant". Address all such communications to the Editor, this JOURNAL, 23 East Elm Avenue, Wollaston, Massachusetts.

J. H. S.

Staphylococcic Food-Poisoning and Dairy Products*

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PREVIOUS to 1930, staphylococci had not been generally recognized as harboring within the genus, some strains that were capable of producing food-poisoning in human consumers, although Barber, in 1914, had incriminated *Staphylococcus albus* as the probable cause of an outbreak in the Philippines (1). His experimental proof had included himself and others, as voluntary consumers of cultures in milk, propagated from the strain isolated from the udder of a "healthy" cow.

In 1930, Dack (2) and his associates presented convincing evidence that human volunteers experienced nausea and diarrhoea after consuming *sterile filtrates* obtained from broth cultures of staphylococci. These organisms had been isolated from a custard (cream) filled layer cake. This food has been involved in an outbreak of gastro-enteritis. As a result of their published work, staphylococci in food-poisoning has been reported in considerable frequency by a variety of workers who have incriminated a variety of foods.

During the 32-year period from 1907 through 1939, we have information pertaining to 82 outbreaks, in 63 of which at least 4,123 individuals were involved. Stone reported upon this data in 1939 (3). It was possible to list the foods mentioned into four general groups, as shown in Table 1.

The reporting of the probable kind of food that caused an outbreak provides interesting and valuable information but the benefits derived from an intensive investigation of an outbreak of staphylococcic food-poisoning is slight in proportion to the cost of the time and materials involved in making it. Persons stricken are usually convalescent if not actually recovered even before cultures have been propagated from the suspected foods. If an investigation resulted in the market seizure of a conveying food, further associated cases in the community could be prevented. This, however, seldom occurs—usually cannot occur since the single batch of toxic food involved has been largely consumed. Most of these outbreaks involve perishable foods which are, therefore, no longer available to other consumers.

Some investigation is desirable in order to add to our accumulating epidemiology but experience leads me to believe that but little community benefit results from the feeding of human volunteers, the selection and boarding of susceptible monkeys, or the procure-

TABLE 1

EIGHTY-TWO OUTBREAKS INVOLVING STAPHYLOCOCCI LISTED AS TO KIND OF FOOD

Group	Kind of food	Total episodes	% of episodes	% of cases
1	Custard filled	37	45.1	58.0
2	Meat and preparations.	28	34.1	25.8
3	Dairy products	14	17.1	14.3
4	Other than above (salads, etc.)	3	3.7	1.9

* Read before the Thirty-first Annual Convention, International Association of Milk Sanitarians, October 30, 1942, at St. Louis, Missouri.

ment of alley cats for the routine "proving" of strains isolated in an outbreak.

We can spend our time and money to better advantage by the utilization of what we have learned in previous investigations to accomplish *prevention* of future outbreaks rather than to draw a post-episode conclusion of why an outbreak happened.

Stritar, Dack and Jungewaelter (4) advocated the rebaking of eclairs and other such products after custard filling, thus effecting a sort of "pasteurization" within the pastry. If this advice were generally followed by bakers, we could reasonably expect that most of the eclair type of outbreak would no longer occur. The *principles* of their recommended processing are applicable to other food groups that are apt to be involved. These principles include adequate protection of the susceptible food from a contaminating environment, adequate refrigeration of perishable foods and adequate sterilization by heat when heat is a part of the process. It is in that interval between refrigeration and sterilization or between sterilization and subsequent refrigeration that *incubation* effects the damage.

Since the toxin produced is relatively thermo-stable (4) (23), withstanding even 30 minutes in boiling water (4-a), it is theoretically possible to have a toxin-carrying food actually free from demonstrable living staphylococci, as a result of heat treatment after contamination and incubation. However, our available literature does not report outbreaks of this nature. An appreciable proportion of outbreak studies indicates that recontamination after heat processing, or contamination and incubation without heat processing, causes the majority of these toxicities. Outbreaks due to dairy products could be largely avoided by keeping adequate cooling always in mind.

In the listing of food groups in Table 1, dairy products accounted for 17.1 percent of the reported outbreaks during a 32 year interval. In 19 of 23 dairy product outbreaks, the *minimum* number of cases involved is presented. This totaled 1,332 persons (see Table 2).

Ice Cream

In our own experience, ice cream involved in staphylococci food-poisonings has been due to either the custard-containing, French vanilla type, or else was institution- or home-produced.

An example of the French vanilla type occurred in Pasadena, California, on Armistice Day, 1928, investigated by Arthur (7) (7a).

A custard mix had been "cooked" and then "refrigerated" in a poorly constructed and inadequately maintained cooling chamber.

From this stock, portions were removed, added to an ice cream mix, and then frozen on two successive days. On the third day, for an Armistice Day church social, the caterer made up the third mix from this stock. Approximately 200 cases of food-poisoning resulted. These occurred two years previous to the reported work of Dack *et al.* (2), but the clinical record establishes these as typical staphylococcus food-poisoning symptoms. Arthur and Stone worked together on strains isolated, which were hemolytic *Staphylococcus aureus*. Two kittens were fed with the strains as milk cultures. This resulted in profuse diarrhoea. Investigation showed that the custard used had ample opportunity for contamination and incubation at room temperature, possibly for several hours, during the three days that the custard preparation was in use.

The two other ice cream episodes investigated by Arthur occurred in hotel-made ice cream. Investigation showed poor *handling* techniques, Staphylococci were isolated in both instances (1931, 1935). Bacterial plate counts exceeded 100,000,000 colonies per gram of the two preparations. In both instances *unused table cream from dining room table services* was pooled and used in preparing the ice cream mix. The hotel kitchen was elaborately equipped in food handling facilities. No other outbreaks have occurred since 1935 at which time the stressing of the dangers lurking in pooling unused but exposed cream services apparently was taken seriously.

Home-made ice cream cases were involved with raw milk cases from a three cow supply reported by Shaughnessy and Grubb in 1935 (14). The milk was air-cooled, and was usually consumed within two to three hours after milking. A positive brom-thymol blue test was obtained on one quarter of each cow. Only one staphylococcic strain out of several isolated and studied affected a monkey *(Macacus rhesus)*. This was a hemolytic albus, smooth colony, isolated from a composite sample of milk from all four quarters of all three cows.

McCastline and co-workers in 1937 (15) reported on two flavors of ice cream custard as the apparent sources of 31 cases of food-poisonings.

Plate counts were 4 billion and 10 billion.
Hemolytic aureus, coagulase positive, Mannite negative.
Hemolytic albus, coagulase and Mannite positive.
Throat and nose cultures of all workers concerned yielded the same *in vitro* typing as in the ice cream strains.
A maximum of four hours incubation was possible, previous to freezing.

In the observations of Meyer and Stone (11), there existed an interval between morning and afternoon fillings where equipment stood at room temperature coated with melted ice cream. A reticent producer prevented the definite establishment of the actual time interval that prevailed.

TABLE 2

Dairy Products Involved in 23 Outbreaks Which Involved Staphylococci as the Probable Etiological Agent (1914–1942)

Year	Reference	Investigated or reported by	Type of product	Cases reported
1914	No. 1	Barber	Raw milk	...
1931	8	Ramsey & Tracy	Raw milk	21
1932	9	Tanner & Ramsey	Raw milk	20
1934	10	Crabtree & Litterer	Raw milk	240
1934	12, 12a, 12b	Arthur & Stone	Raw milk	About 200
1935	12	Stone	Raw milk	2 families
1935	14	Shaughnessy & Grubb	Raw milk and homemade ice cream	25
1934	12	Stone	Gal. cans evap. milk used in scalloped potatoes	At least 100
1937	12	Kessel & Stone	Dried milk (bread pudding)	90
1939	5	Hackler	Pasteurized milk	29
1927	11 & 7a	Arthur & Stone	French van. ice cream *	200
1931	7	Arthur	Hotel-made ice cream	50
1933	11	Meyer & Stone	Bulk ice cream	66
1935	7	Arthur	Hotel-made ice cream	12
1937	15	McCastline, et al.	Ice cream	31
1935	13	Fahning	Possibly butter	...
1935	12	Arthur & Stone	Hollandaise sauce	12
1939	16	Dolman	Hollandaise sauce	34
1940	6	Dieter, Greene, Stone	Modified butter	150
1942	7	Arthur	Hollandaise sauce	Several
1942	22a	N. Y. State	Hollandaise sauce	At least 28
1942	22b	N. Y. State	Hollandaise sauce	17
1940	—	Stone	Jack cheese	5

Total *mentioned* cases: 1,332

* It is interesting that Arthur cited, in 1928, "the symptoms . . . acute nausea and diarrhoea, with spastic abdominal pains, beginning in from three to four hours . . . recovery occurred quickly in most instances (7a)."

Nevertheless, in all of these observed outbreaks, an incubation period at room temperature of the mix, or ingredients added to a mix before freezing, did occur. Certainly, these unfortunate outbreaks should be charged against the improper handling of perishable foods rather than on the food itself. We can reasonably assert that these outbreaks could have been avoided through the use of pasteurized milk together with protection from contamination of all ingredients. These should have been properly refrigerated during the intervals that the product was in an unfrozen state.

Cheese

Scott of Great Britain refers to "toxin outbreaks" when short incubation periods, abdominal pains, and vomiting occur within 30 minutes to 4 hours after ingestion of the suspected food, followed soon after by diarrhoea, with severe symptoms subsiding more rapidly than in the salmonella infection, and then with convalescence established within 24 hours. He mentions 183 such outbreaks from the period 1929–1938. Only 3 of these concerned a dairy product. This was cheese (17).

Dack also refers to cheese in outbreak reports, and Jordan mentioned four cases in Puerto Rico (21).

In Los Angeles County we have not had the time to experiment much with cheese. However, a few samples, only one of which was associated with food-poisonings yielded the results tabulated in Table 3.

Admittedly, we know very little about this problem in cheese. In our only case, sliced cheese, manually treated at home, was exposed to an infective environment at room temperature. This "abuse" could have resulted in both contamination and incubation in the consumer's kitchen. From both the public health official and the producer standpoint, continued published emphasis that such a food was vulnerable to contamination within the home should ultimately result in less carelessness with such a food.

It is pertinent, also, that Minett mentioned that the staphylococcus toxin remained active in cheese made from contaminated milk (23).

TABLE 3

Jack Cheese Observations on Staphylococci Strains Observed in the Los Angeles County Health Department Laboratories

Strain No.	P	H	S	C	D		Cases	Date
114–1	+	+	—	+	—	(repeated tests)	None	1939
731–1	+	+	—	+	—	(repeated tests)	None	1939
173–1	+	—	—	+	—	(repeated tests)	None	1939
N–51–4	—	+	—	—	—	(repeated tests)	Variant of N–51–1	1940
N–51–5	+	+	+	—	—	(repeated tests)	Variant of N–51–1	
N–51–1	+	+	+	+	+		5	

P + signifies other than albus.
P — signifies albus.
H + signifies hemolytic.
H — signifies non-hemolytic.
S + signifies active zoning on Stone's beef-extract-gelatin agar.
S — signifies not active zoning on Stone's beef-extract-gelatin agar. (19-a, b, c, d, e, f)
C + signifies coagulase +.
C — signifies coagulase —. (20-a, b, c, d, e)
D + signifies Dolman kitten test +.
D — signifies Dolman kitten test —. (21-a, b, c)

Butter

Fanning (13) mentioned butter as "possibly" the cause of staphylococcic food-poisoning. However, in six other outbreaks listed in Table 2, butter was quite evident as the contaminated food product, *but in every instance the butter had been modified* by the introduction of other ingredients. Hollandaise sauce, in particular, appears to be susceptible.

This mixture of egg yolk, butter (or butter fat as cream), water, lemon juice, and salt is kept warm for a number of hours while in service. It is a common practice to squeeze the preparation manually through cheese cloth to remove lumps so as to obtain a "smooth" product. Opportunity for contamination and subsequent incubation is very real.

Los Angeles City experienced an outbreak at a school teachers' banquet. About 150 persons were affected. Investigation soon established that the butter served was the only food used in common by all of the cases. The local newspapers gave the event a front page banner headline; the public was demanding further news. Somehow or other some health official mentioned "butter." A follow-up news story stressed this with a comment to the effect that bugs jumped off a food-handler's sleeve and landed in the butter. Some of the public became alarmed at these "jumping bugs" and telephone calls to the butter expert of the State Department of Agriculture, Mr. H. B. Greene, and to neighboring health departments were numerous. The butter trade, for a few days, was affected by this unfortunate publicity.

Mr. Greene investigated the technique of the caterer. He found that roughly two parts of butter were placed in one part of warm water, to make a soft emulsion. This mass was vigorously mixed by using an electric beater. One thousand buns were warmed, sliced and then "buttered" with this soft preparation. The warmed, buttered buns were held in a warm kitchen until served. Buttering actually started before noon and was continued at intervals throughout the day. The buns were, therefore, subjected to an environment favoring incubation for a period varying from four hours to approximately seven hours. Stone, at the request of Los Angeles City and the State Department of Agriculture, subjected isolated staphylococci to cultural and Dolman kitten tests. The organism was a slightly hemolytic aureus, Mannite and coagulase positive, producing large zones on beef-extract-gelatin agar. Kittens gave a typically positive Dolman reaction.

Heat Processed Milk

In 1934 Stone (12) investigated an outbreak in a mountain camp which involved at least 100 persons. Gallon cans of evaporated milk had been used in preparing scalloped potatoes. These had stood exposed for several hours, in a warm kitchen, before warming up and serving. A sample of the actual potato preparation was not available, but gallon cans of the milk used, carrying the same code number as the milk used in preparing the product, yielded hemolytic staphylococci when 15 grams of the milk were cultured in a dextrose blood broth. Other code numbers of gallon cans of the same product did not yield gastro-exterotoxic staphylococci. Stained smears of the milk from the freshly opened cans showed many gram positive diplococci present. The canner acknowledged difficulty in the recent conversion of plant equipment to handle the larger gallon receptacle.

Kessel and Stone (12) investigated an outbreak affecting about 90 persons in an institution feeding indigents. Bread pudding was epidemiologically involved. This had been prepared with bread, sugar, raisins, dried milk, and flavoring extract. Direct smears and cultures incriminated the bulk dried milk which not only was exposed in an open barrel but was also handled with a metal scoop. This provided opportunity for frequent environmental and manual contamination. The mixture of dried milk, water, bread, etc., stood for several hours at room temperature before serving.

Hackler (5) reported an outbreak

affecting 29 persons, involving pasteurized milk. However, his investigation showed the probable contamination of the product subsequent to pasteurization. Among employees of the plant were found individuals harboring similar organisms in their respiratory tract.

Raw Milk

The actual milk-borne outbreaks included in Table 2 have been augmented by observations of gastro-enterotoxicity in strains of staphylococci isolated from milk, but unassociated with known cases of food-poisoning other than that produced in human volunteers (23) (9). Dolman reported (21-b) that of eleven raw milks cultured, nine yielded positive Dolman tests. Minett (23) demonstrated gastro-enterotoxicity in 10 of 16 strains isolated from bovines with mastitis, and 7 of 23 strains positive from normal milk. Gwatkin (24) showed that 2 of 9 bovine mastitis-involved strains were gastro-enterotoxic (Dolman tests) and that 4 of 8 strains from normal or suspicious udders were positive by the Dolman test.

In our random sampling, we have, by the Dolman kitten test, obtained 2 cows positive of 5 (mastitis), and 4 cows positive of 13 ("normal" udders).

Thus, at least four workers have demonstrated gastro-enterotoxicity in 38 of 85 milk samples not associated with any *reported* human cases. Of these, at least 24 positive of 55 strains are mentioned as isolated from apparently normal bovine udders. Staphylococcus mastitis has also been involved in some of the raw milk outbreaks listed in Table 2, particularly Barber (1), Crabtree and Litterer (10), Arthur and Stone (12, 12-a, 12-b), and Shaughnessy and Grubb (14). We have previously quoted that cheese prepared from staphylococcic contaminated milk remains toxic (23) and that ice cream prepared from contaminated milk, remained toxic (14).

Plastridge *et al.* (25) reported that staphylococci were apparently responsible for about 10 percent of the abnormal conditions studied, while Gwatkin and Hadwen (26) reported that of 260 cattle, 143 were affected with mastitis, and that in 30 of these 143, staphylococci were incriminated. Hucker and Haynes (27) found 20 percent of 7,000 cows were shedding orange-colored gelatin-liquefying staphylococci.

It is apparent, therefore, that hemolytic staphylococci can be expected to be present in raw bovine milk not infrequently, and that some of these are capable of producing a gastro-enterotoxic substance under certain favorable conditions. See reports by Crabtree and Litterer (10) and Shaughnessy and Grubb (14) in particular.

That properly cooled raw milk, later abused in distribution, can lead to grief was demonstrated in an investigation made by Arthur (12-a, 12-b). On December 10, 1934, a typical outbreak of staphylococcic food-poisoning occurred in Pasadena with ultimately about 137 cases, with a simultaneous outbreak in an adjacent county approximating 70 cases.

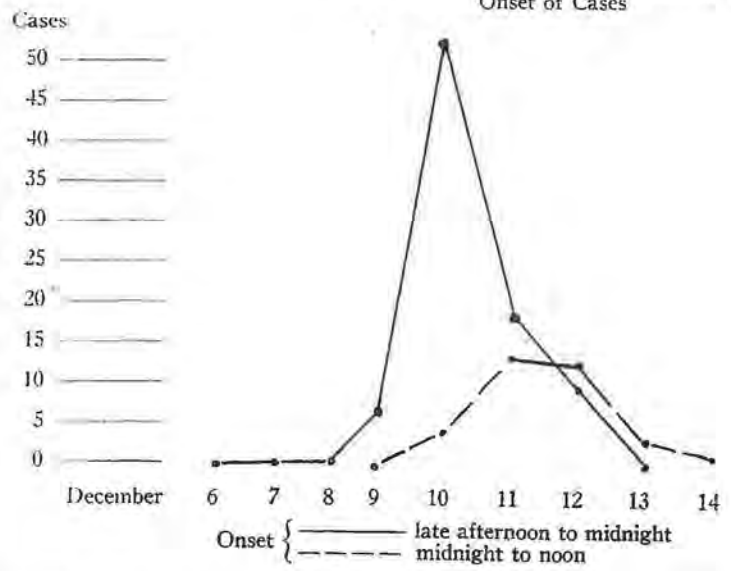
One raw milk distributor served all of the cases, although it was not uncommon to find that among customers of this dairy, one family would be affected while others in the neighborhood were not. Arthur's investigations presented an interesting result as shown in Table 4.

A majority of the Pasadena cases occurred between noon and midnight of December 10 with a smaller number occurring from midnight to noon on December 11 and 12.

It was apparent that of the two deliveries of milk made daily by the dairy, something occurred on the December 10 morning delivery that was unusual. Further investigation developed that in most of the families stricken, milk was left sitting as delivered, outside of the

TABLE 4

Milk Poisoning, Pasadena, California, 1934
Onset of Cases



house until members of the families returned home from work. When milk, at delivery, was promptly refrigerated by the housewife, no cases occurred. Several hours incubation at outdoor temperature was possible at most of the homes affected.

Both Arthur and Stone were fortunate in obtaining samples of the milk deliveries of December 10. Both workers, in separate laboratories, isolated hemolytic, orange-pigmented staphylococci. At the time, Stone fed his strains to kittens as milk cultures. Both kittens experienced a severe diarrhoea. Stone carried his isolation as Strain No. S-10 which many months later was shown by him to be coagulase positive, and which produced a typical Dolman reaction in kittens.

The dairy involved was exceptionally well conducted, milk being poured over a refrigerated cooler as each milk bucket was filled (hand milking). This milk was kept under 50° F. while bottling and distributing.

Samples taken from the 30 cows at the dairy by the Pasadena Health Department were cultured by Arthur who found one cow shedding hemolytic staphylococci from all four quarters. Clinically, this cow was suffering from an acute mastitis; was eliminated from the herd by the owner. Arthur fed this cow strain to two kittens as milk cultures. Both kittens developed severe diarrhoea, one of them dying.

The literature and experience having shown that hemolytic orange pigment-producing staphylococci are not unusual in raw milk and that some of these are capable of producing food-poisoning, it would appear to be paradoxical that more outbreaks of milk poisoning do not occur.

In Table 5 we observe that, in Los Angeles County, the majority of our outbreaks are associated with a single meal on a single premise.

California dairy laws have long compelled the prompt cooling of milk after milking and then maintaining it under 50° F. during distribution. It is very probable that occasional sporadic cases occur which are not reported.

Again Arthur has gathered interesting data which suggests an unrecognized outbreak possibly due to a low

TABLE 5

DISTRIBUTION OF OUTBREAKS

Food group	One premise	More than one premise
Pastry products	7 episodes	2 episodes
Meat products	16 episodes	1 episode
Dairy products	8 episodes	1 episode
Other	1 episode	None
	88.9% of the total	11.1% of the total

degree of toxicity in the marketed product. Through the courtesy of Mr. Arthur, Health Officer of Pasadena, California, I am privileged to report this evidence.

A dairy produced both raw and pasteurized milk, using one herd for the dual production. A half-dozen or so reports of gastroenteritis were received by the Pasadena Health Department from private physicians. These occurred within an interval of a few days. Such an incidence was unusual enough to attract Arthur's attention; and when these few cases reported that they regularly consumed the raw milk from dairy "A," a check-up was made of other families using this raw product. The question asked of every one in this house-to-house survey was, "Has anyone in this family experienced a gastro-intestinal upset during November?" Twenty-seven and seven-tenths percent of the families answered "Yes"; the affected portion of these family populations was 23.5 percent.

Carrying the survey further, families using the *pasteurized* product of dairy "A" yielded only 2.6 percent of families having upsets, with only 1.3 percent of the population of this group affected. It was suspected that these cases represented a "normal" expected incidence of sporadic gastrointestinal upsets, and with that thought in mind, the incidence of such upsets was obtained in 81 families consuming raw milk produced by other than dairy "A." In this group, 4.9 percent of the families recalled upsets with 2.5 percent of the family populations affected.

A number of cows, suffering from mastitis, were found in dairy "A." Hemolytic staphylococci were isolated from these cows.

Table 6 includes this data:

TABLE 6

SURVEY OF CASES OF GASTROENTERITIS IN PASADENA, CALIFORNIA (C. W. Arthur data)

November, 1935

	Consumers of *raw* milk from dairy "A"	Consumers of *pasteurized* milk from dairy "A"	Consumers of raw milk produced by other than dairy "A"
Number of families visited	72	77	81
Number of families experiencing gastroenteritis during November, 1935	20	2	4
Percentage	27.7	2.6	4.9
Number of individuals in these families	208	219	273
Number of these individuals who experienced gastroenteritis	49	3	7
Percentage	23.5	1.3	2.5

SUMMARY

1. Of 82 staphylococci involved, food-poison outbreaks, dairy products were associated with 14 instances, or 17.1 percent of the total.

2. In seven raw milk-involved outbreaks, at least 506 cases were reported. Mastitis and staphylococci-shedding were usual in cows associated with the producing herds; failure to attain and maintain 50° F. or under from time of production to actual consumption allowed ample opportunity for incubation in most of these.

3. Heat-processed milk is unusual as the incriminated food in staphylococcus food-poisoning but can occur through inadequate processing or recontamination.

4. Ice cream involved in outbreaks have included a custard ingredient, or included conditions permitting room temperature incubation of ingredients before freezing.

5. Cheese associated with such outbreaks is unusual but can be toxic from contaminated milk used and can be "abused" in the home favoring recontamination.

6. Aside from one 1935 report of butter as "possibly" the cause of an outbreak, all other known butter-involved episodes have actually been due to some *modification* of butter, such as in Hollandaise sauce.

CONCLUSION

The majority of dairy product-involved outbreaks of staphylococcic food-poisonings were due to failures in either prompt obtaining and maintaining adequate cooling or the lack of protection to the food or its ingredients from possible contamination and incubation.

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Bactericidal Effect of the Paraffining of Paper Board Used for Paper Milk Containers. Frederic J. Moss, Robert C. Thomas, and Mildred K. Haven. *Public Health Reports, 56,* 944-956 (1941). Reprint No. 2273.

Methods used for the bactericidal treatment of glass milk bottles are not generally applicable to the bactericidal treatment of paper milk containers. Since practically all paper milk containers are paraffined, this study was made to obtain data useful in determining temperature and time combinations of paraffining that would provide adequate bactericidal treatment of the surfaces of the paperboard in these containers. A paraffin temperature of about 160°–180° F. is generally used for the paraffining of paper containers in this country.

The authors report studies which have been made by other investigators on the bactericidal effect of the paraffining of paper milk containers. In some studies *Esch. coli* has been used as a test organism and the work has been directed toward obtaining time-temperature combinations of paraffining required to produce sterility. Cultures of *Esch. coli,* however, vary in their thermal resistance. If the culture used is more or is less heat-resistant than the most heat-resistant pathogen transmissible through milk supplies, then the time-temperature combinations of paraffining required to produce sterility will be more or less stringent, respectively, than are necessary. *Esch. coli* was also used as a test organism in this study. The thermal resistance of the strain was such that a 24-hour skim milk culture in sterile skim milk (initial count 1,000,000 colonies per ml.) showed a 99 percent reduction at 140° F. for 20 minutes, the time-temperature combination taken as lethal for the most heat-resistant pathogenes transmissible through milk supplies. The work was therefore directed toward determining the time-temperature combinations of paraffining required to produce the criterion reduction.

Paraffin is an anhydrous substance, so any factors which affect the moisture content of the paperboard and especially the surface moisture at the time of paraffining would influence the bacterial reductions due to the paraffin treatment. In a test procedure these factors would be the original moisture content of the paperboard and of the bacterial culture used, together with the drying that occurred between application of the bacterial culture and subsequent paraffining of the paperboard. Moisture conditions with respect to the paperboard were therefore controlled throughout the entire experiment. A detailed description is given of the laboratory test procedure in which 2-inch test squares of sterile paperboard were contaminated with a stream of *Esch. coli* and after drying were subjected to various time-temperature combinations of paraffining.

The percentages reduction of the test organism was determined for various immersion times at paraffin temperatures of 160°, 165°, 170°, 175°, and 180° F. A total of 15 to 25 separate test pieces of paperboard were used at each of the time-temperature combinations studied. A mean 99 percent reduction of the organism due to paraffining was obtained in about 10 seconds at 180° F., 20 seconds at 175° F., 35 seconds at 170° F., 2 minutes at 165° F., and 4 minutes at 160° F. These results indicate the greater mean bactericidal efficiency of the higher paraffin temperatures used. Charts are given which show the effect of moisture on the bactericidal efficiency of paraffining, the mean percentages reduction for various time-temperature combinations of paraffining, the relation between paraffin temperature and immersion time for 99 percent reduction of the test organism, and the individual and mean percentages reduction at one of the paraffin temperatures studied.

If the paraffining process is to serve as the bactericidal treatment for the surfaces of the paper container, the use of the higher temperatures studied appears essential, unless the immersion times generally used are considerably increased. If the use of the higher paraffin temperatures is impracticable, it may be necessary to subject the containers to separate bactericidal and waterproofing treatments or provide means for increasing the bactericidal effect of paraffining.

F. J. Moss

Loss of Lactose Fermentative Power by Coliform Bacteria

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TESTS for the presence of a coliform bacteria in water and other materials depend upon the ability of the organisms to ferment lactose with the production of acid and gas. If the organisms fail in this respect they are not recognized in routine tests, and the presence of fecal contamination may be overlooked. It is therefore important to recognize conditions which may inhibit the fermentation of lactose by this group of bacteria.

In the course of pasteurization experiments with pure strains of colon bacilli inoculated into sterile milk, post-pasteurization bacterial counts were made by means of the "most probable number" technique, using lactose broth fermentation tubes. Heavy growth was sometimes noted without gas formation. A number of such growths were investigated further, and proved to be Gram-negative rods. A few reverted to lactose fermentation under cultivation, confirming their identity as coliforms. Other strains retained various degrees of impairment of lactose and dextrose fermentation during the short period of observation, but were otherwise typical.

In addition to the heat treatment, another manipulative procedure was involved, which conceivably could have had an effect. This was the dilution of the culture for counting, done with 0.85 percent saline. Accordingly, the following experiment was tried. A culture of a strain which was fermenting lactose with acid and gas production was diluted 1:1-billion with 0.85 percent saline, with thorough shaking. Milliliter portions of this dilution were inoculated into 480 lactose broth tubes, and incubated for three days at 37° Centigrade.

At the end of this time, 213 tubes showed growth, but none showed normal gas production. Not more than 5 percent showed even a suspicious bubble of gas. Streak plates on both eosin-methylene blue agar and plain nutrient agar were made of the tubes showing growth. After incubation at 37° C. for twenty-four hours, the nutrient agar plates all showed small, white, shiny slightly-raised colonies. The eosin-methylene blue agar plates showed small pink shiny colonies totally lacking metallic sheen. Staining confirmed that the organisms were small Gram-negative rods. Through circumstances beyond our control, it was not possible to follow these organisms further, to test how long lactose fermentative capacity was lost.

Lembke (1937) mentions a somewhat similar phenomenon occurring with experimental pasteurization of coliforms, and ascribes it to prolonged heating. However, in his manipulations the bacteria were likewise suspended for at least a time in saline solution. In a statistical study of methods of enumerating coliforms, Sandholzer (1942) found that 2 percent saline used as diluent gave significantly lower counts than did phos-

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phate buffer or distilled water. Even sea-water was better than the concentrated salt solution.

It seems therefore that under some conditions the standard procedures for detection of coliforms may be decidedly inadequate. This is a matter to be considered very thoughtfully when saline waters are in question, and may be significant also in other waters. The relations should be worked out further. Saline dilution water in making colon counts should be used with great hesitancy.

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Development of Training Courses for Food Handlers in Texas. Lewis Dodson. *Amer. J. Pub. Health*, 32, 189–92 (Feb., 1942); *P. H. Eng. Abs.*, xxii: Mi: 14.

Food-handling ordinances must be accompanied by intelligent cooperation of the industry for success in any supervisory service dealing with the problem. Such cooperation is impossible unless food-handling personnel are educated in sanitation; the training courses described were set up as being more effective in filling this need than the occasional conferences of routine inspections.

The first course, consisting of a total of 12 hours' training in food-handling sanitation and related subjects, began after considerable advertising with about 800 enrolled. Favorable comment resulted in the training of additional itinerant instructors to carry on the same program in other parts of the State. Full-time instructors were next provided for the larger cities and finally one sanitarian in each county was trained to give the course locally at frequent intervals.

Throughout the State the courses are substantially the same. All the fundamental methods of teaching are utilized, and printed information given out at each meeting is kept by the student in the form of a manual for later reference.

Individual certificates for successful completion of the course are issued, while wall placards are given by some cities to those establishments all of whose employees have secured the individual certificates.

An enrollment fee of 50 cents is charged in the large cities where there are full-time instructors. This is paid by the employer or, if by the employee, refund is made upon completion of the course.

R. S. GREEN.

The Midwest Dairy Agreement. *State Government*, 14, 267 and 284 (Nov., 1941); *P. H. Eng. Abs.*, xxii: Mi: 13.

The article gives the background of an agreement between certain Midwest States to improve and make uniform standards for the dairy industry in this section. Signatory States have eliminated dairy trade barriers among themselves and are raising their own standards so other States cannot disguise economic trade barriers as sanitary or health regulations. The Interstate Cooperation Commissions and the Council of State Governments drafted provisions and have secured approval from officials in the States of Indiana, Iowa, Kentucky, Minnesota, Tennessee, and Wisconsin. The principles of the agreement have been approved by officials in Illinois, Michigan, and Ohio. The agreement establishes and gives official recognition to an improved set of dairy standards which may be met by milk producers who wish to sell in new, out-of-State markets.

H. S. ADAMS.

Staphylococcus Aureus as the Source of Mass Food Intoxication. L. Fingherov. Jl. Microbiol., *Epidemiol. et Immunobiol.*, Moscow, 1940, No. 1; *Bul. Hyg.*, 16, 342 (July, 1941); *Pub. Health Eng. Abs.*, xxii: Mi: 15.

"The toxic food was cream tarts, and *Staph. aureus* was obtained in almost pure culture from the cream. Investigation revealed that the pastry-cook who made the tarts was attending the dispensary for a burn of the second degree. This was discharging pus and from it an identical *Staph. aureus* was isolated. The identity was evidenced by the pigment, the biochemical characters and the toxins obtained from 8-day cultures."

L. K. P.

Dairy Inspection in War-Time*

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THE impacts of the war on dairy and milk inspection may be more apparent to some of us in Washington than they are to some of you who are a little farther removed from intimate contact with the various government agencies. It is unnecessary to point out that we are at war; everyone knows that; but not everyone realizes the extent of the war effort and the changes that have to be made to harness our activities to an all-out program for winning the war.

CHANGING OUR EMPHASIS

We know that business cannot be conducted as usual. Not all of us realize, however, that the same thing applies to individuals and to individual jobs. Jobs and objectives have changed and can no longer be conducted on the usual basis. This applies just as much to the work of the milk sanitarians as it does to the activity of anyone else. Certain conditions have arisen which must necessarily change our viewpoint of what can be expected and what may be accomplished.

I have no hesitancy, in appearing before you, to urge each one to make a careful re-examination of his plans and methods of operation. If certain recommendations that I make seem somewhat retrogressive, I have no excuse to offer except the very vital and critical one of prosecuting this war to a speedy and successful termination. I think that my work over the past thirty-odd years in dairy sanitation will belie any accusation that I do not have the welfare of sanitary progress at heart.

As I see it, the job of the dairy sanitarian during the war is in the main not so much to improve present sanitary conditions as it is to hold on to improvements already made. This does not mean that flagrantly insanitary practices can be condoned, but it does mean that non-essential requirements must be weeded out. This is especially true as regards new equipment. As you probably know, it is difficult, if not practically impossible, to procure new equipment of many kinds, and it will become increasingly difficult.

The War Production Board has already issued Order L-170, which provides only enough material to make approximately 20 percent as much farm machinery as was made in the past year. While the various items under the machinery program are not all the same, some having higher percentages and some lower than others, the over-all picture is for only 20 percent; and no types of machinery will be manufactured in as large quantities as before. It also has been decided that most if not all types of machinery will be rationed. The rationing will probably be by allocation of quotas to states and counties and by distribution of all the available material after the needs of the individual have been carefully examined by committees constituted for that purpose. Milking machines and milk coolers are included in this list of rationed machinery.

* Presented at Thirty-first Annual Meeting of the International Association of Milk Sanitarians, St. Louis, Missouri, October 30, 1942.

We have had to abandon some materials of choice in the dairy industry, such as stainless steel and aluminum, and have had to substitute less durable and less satisfactory materials because our fighting forces have a greater need for these critical materials than we. This is not a question altogether of the inspector's judgment or desires, because some materials and pieces of equipment are no longer procurable under any circumstances. There is and will continue to be a certain amount of depreciation in dairy equipment. In the past, dairy plants have carried a rather large figure for obsolescence; new types of machinery have come on the market which have been improvements over older types. In times of peace and when money and materials are readily available, replacement of outmoded equipment with more modern equipment is a very legitimate business practice. During these times, however, there should be little or no change ordered because of obsolescence alone.

Reports have come to the Department of Agriculture and to the War Production Board from a number of places where inspectors have ordered the replacement of serviceable dairy machinery with other machinery having some new gadget or device. This is not the time to require such changes. The machinery now in use has been capable of producing and processing milk satisfactorily for your communities. Such apparatus should be kept in use by repair and reclamation.

I think the general trend of opinion in public health circles and in agriculture is quite similar. The following quotation is from an article by Dr. J. W. Mountin, Assistant Surgeon General, United States Public Health Service, which appeared in the October issue of the *American Journal of Public Health:*

"We had sanitation before many of our modern improvements came into being. Until the new and improved products are available again, we will have to make the old ones do. I will even venture the possibility that before this war is over some of our sewage may again have to be carried in open ditches."

Furthermore, it is often possible to purchase second-hand equipment which can be made perfectly serviceable by reconditioning.

Importance of Educational Efforts

The dairyman at this time is beset by many difficulties. He is unable to buy all of the labor-saving equipment that he might want. Farm labor is being drained from the country into the armed forces and into industrial operations. Industries pay much higher wages than the farmer can afford to pay. The inspector's job, in my opinion, is to devote most of his energy to methods rather than equipment. In other words, let us come back to the A B C's of dairy sanitation. First of all, the consumer must be protected from milk-borne diseases. Milk inspectors should give special attention to the purity of water supplies, to the proper disposal of sewage and waste, to the removal of transmissable diseases from the herd and from among the attendants, and to the elimination of flies that may come in contact with milk or milk utensils. Then if the milk is drawn into sterilized utensils and promptly cooled, the milk inspector will have gone most of the way in seeing that milk will be safe for human consumption, provided it is subsequently properly pasteurized.

This may seem rather rudimentary to you who are so well-versed in dairy sanitation, but I have knowledge that some inspectors are still rather far afield in the realm of theory rather than actual practice and it would be well for us to re-evaluate our positions. No milk that is not produced under adequate sanitary conditions should be placed on the market. There is no argument about this, but there is room for discussion as to just how far we can go during this emergency beyond the point of reasonable safety. This whole thesis presupposes the pasteurization of milk, and efforts should be intensified to keep a more complete check and control on the pasteurization process, which in the final analysis is the last step in the protection of public health.

This is an especially favorable time for the sanitarian to help the farmer. The farmer can be helped to conserve the equipment he already has. For instance, he can be taught that the prompt cleaning and the thorough drying of equipment, especially milk cans, will prolong their useful life. The situation is so acute that everything that can be done to help farmers to prolong the life of equipment is a very definite step toward reducing the need for additional metals. Frequently the control authorities can be useful by helping to move idle equipment to a place where it is needed. The War Production Board has urged that, in view of the shortage of many types of dairy equipment, efforts be made to locate any such unused or idle equipment so that it might possibly be sold or transferred to other areas where there is urgent need for it. Any information you can get along this line should be furnished directly to the Dairy Products Section, Food Division, War Production Board, Washington, D. C.

Perhaps this may not appear to you as being one of the duties of the sanitarian. If it is not one of his duties, it is certainly one of his privileges at a time like this. Now, if ever, is the time for an inspector to be an instructor and a helper. To put it plainly, an inspector's usefulness can be measured by how little rather than how much trouble he finds. I mean by this that if he has done his job as an instructor carefully and conscientiously, his producers and distributors will be so well trained that they will operate efficiently in the production of sanitary milk. If there is constant friction with dairymen and constant trouble with the milk supply, it is pretty fair evidence that the inspector has been negligent in his particular field.

It is perhaps easy enough to demand that a particular result shall be accomplished, but can each one of you do the job that you expect to be done by the farmer or plant operator? You may criticize the cleanliness of a milking machine, separator, or some other piece of equipment, but can you actually take that machine apart and show the operator how it should be efficiently cleaned? It is as much a part of your job to teach and demonstrate as it is to condemn.

I am especially impressed with the opportunity to educate the younger generation along sanitary lines. What are you doing in your community to stimulate the interest of the boys and girls who will some day be the milk producers in your territory? I know that such work has been done very successfully in some localities and I believe the effort is well worth the while in the results it will produce. Many of you may be able to point to similar achievements, but I have been very much impressed with the reports from the Baltimore City Health Department on its training course in sanitary milk production for high-school vocational students in its milk shed. This training work was begun, I believe, some ten years ago and consists of lectures and demonstrations, followed by a study of sanitary milk production in routine class work. When the students have received sufficient instruction, the health department demonstrates in each locality exactly how methods should be carried out to meet the essential provisions of the city ordinance. May I quote a very striking sentence from the report given of this work: "Many of the high-school pupils who participated in the contest are now milk producers in the Baltimore milk shed and have found the contest training high-school days to be of value in their occupation."

Objectives

Of course this seems like a long-time objective, but really our work has two aims. One is immediate results and the other long-time results. Immediate results are secured sometimes only by disciplinary action and are necessary in many cases. A long-time job may not be so important in this particular emergency but it is an integral part of any health department program. There is an old Chinese proverb which runs as follows: "If you are planning for one year—sow rice; if you are planning for 10 years—plant trees; if you are planning for 100 years—grow men." We may have to sow a lot of rice for the next year or two but at the same time we should not neglect the growing of girls and boys into men and women who will be useful in our long-term program.

There is no question but that the country as a whole needs more good milk. If we are to reach the goals set for our armed forces, for lease-lend requirements, and for a reasonable nutritional program for our civilian population, not only will milk production have to be maintained but it will have to be increased. This makes it vitally important that not a single quart of milk fit for human consumption be shut out of any market. Any arbitrary methods used to decrease the milk supply will nullify the efforts of the agricultural agencies to increase the supply to the necessary volume. Our national automobile speed limit has been slowed down to 35 miles an hour. This may seem rather revolutionary to those who have been riding the roads at much higher rates of speed, but in the national interest such a program has been deemed necessary. It may be that we shall have to slow some of our other programs to a commensurate speed limit for the national good.

I want to close with an earnest plea to everyone present to help in our national effort for the conservation of materials and man-power. The government is eyeing not only each ton but literally each pound of metal and other materials that are being used for civilian supply. Every ounce of new material and every hour of labor that can be saved contributes directly to ammunition, guns, planes, ships, and supporting labor for our fighting forces. It is not too much to ask everyone of you to eliminate from his schedule every unnecessary demand. I have the utmost confidence that you will do this. You are used to meeting emergencies and I know that you will wholeheartedly join in aiding the war effort wisely, efficiently, and energetically.

The Rapid Determination of Arsenic in Foodstuffs Contaminated with Lewisite. W. J. Stainsby and A. M. Taylor. *Analyst*, 1941, 66, 233; *Sum. Current Lit.*, 14, 112 (Apr., 1941); *P. H. Eng. Abs.*, xxii: Mi: 13.

"A rapid method for the determination of arsenic in foodstuffs contaminated by lewisite, but not by other arsenical gases, is described. The foodstuff is boiled with a strong aqueous solution of alkali to break down the food material and to hydrolyse the liberated lewisite. It is then acidified with stannated hydrochloric acid, and potassium iodide is added to reduce any quinquevalent arsenic to the trivalent form. After reduction of the arsenious acid to arsenic by means of zinc the normal Gutzeit procedure is used. Comparative determinations were made by this method and by a modification of the wet oxidation-distillation procedure in which the arsenic trichloride was distilled into ice-cold distilled water instead of into nitric acid. In general the results of the two methods agreed but with certain foods anomalous results were obtained.

"Various modified methods for determining arsenic were suggested in the discussion of this paper and of the paper by Williams, H. A. (see previous abstract)."

D. M. M.

Problems in Milk Sanitation Due to the War*

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No discussion of the impact of the war on milk sanitation would be complete without some mention of the safeguards surrounding the milk supplies consumed by our military forces and by the workers in our war industries.

Army Specifications

For several years before the present emergency, Army and Civilian Conservation Corps camps purchased milk under Federal Specification C-M-381b for fresh milk, applicable to all government departments and agencies. The Army specifications required the purchase of Type II pasteurized milk wherever available, otherwise Type III was to be obtained. Type II was milk conforming to the specifications for grade A pasteurized milk as defined in the current edition of the U. S. Public Health Service Milk Ordinance and Code. Type III was milk pasteurized in plants conforming to the pasteurization plant specifications of the current Public Health Service Ordinance and Code, but which had a bacterial count limit of 50,000 per c.c. after pasteurization, and for which the producing farm standards were rather meager.

In certain sections of the country where grade A pasteurized milk conforming to the Public Health Service specifications was not obtainable, the Army had no alternative but to purchase Type III milk, even where a higher quality milk was locally available. To correct this situation, circular letter 134 issued by the Quartermaster General, July 5, 1941, defined two classes of Type II pasteurized milk. Type II No. 1 was grade A pasteurized conforming to the Public Health Service standards and produced in an area which had formally adopted this ordinance. Type II No. 2 was the highest quality pasteurized milk as defined in the local milk ordinance and used by a majority of the population in areas not using the Public Health Service Milk Ordinance. This order also provided that Type II No. 1 should be purchased whenever this grade was available in adequate quantity and provided the cost was not greatly in excess of the cost of Type II No. 2, otherwise the latter was to be purchased. Type III was purchased when neither Type II No. 1 nor Type II No. 2 was available.

As serious shortages in the supply of approved milk available to the Army have developed or are imminent in some sections of the country, the specifications for fluid milk for the Army have been amended by the Quartermaster General's Circular Letter 377 dated October 5, 1942, so as to permit the purchase of Type III pasteurized milk whenever Type II No. 1 or Type II No. 2 pasteurized milk is not available in adequate quantity. Specifications have also been added on the production of Type III milk, including farm and bacterial standards before pasteurization. Milk diverted from manufacturing to fluid channels will have to meet the following standards in order to qualify for Type III:

"Raw milk for the production of Type III pasteurized milk shall, upon delivery to the

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* Read at the Thirty-first Annual Meeting of the International Association of Milk Sanitarians at St. Louis, Missouri, October 30, 1942.

pasteurization plant, have an average bacterial plate count of not to exceed 1,000,000 per c.c., or a comparable direct microscopic count, or an average reduction time of not less than 3½ hours. It shall be produced on premises on which buildings, installations, equipment, water supply, facilities, methods and procedures incident to the production, handling, storage and transportation of raw milk are such as to assure that there is delivered to the pasteurizing plant a wholesome milk."

DEVELOPMENT OF U.S.P.H.S. MILK CONTROL PROGRAM

It may be of interest to compare the extent of the sanitary control of milk supplies now used by military forces and war industries with that in the first World War. In 1917 milk control was almost entirely limited to the larger cities. Except in the latter, practically no pasteurized milk was available. The milk sanitation program of the Public Health Service had not yet been developed, and no uniform milk sanitation standards were in general use. Instead, milk control was in a chaotic condition, with practically no two areas recognizing the same standards for the same grade. Local health services and qualified personnel experienced in milk sanitation were virtually unknown except in the larger centers of population. Under these conditions, adequate supplies of fresh milk of high sanitary quality were out of the question for most of the training camps, and many had to resort to canned milk.

Great progress in milk sanitation has been made since those days. The government program for the eradication of bovine tuberculosis, begun about that time, has reached the stage where every county in the United States is a modified accredited tuberculosis-free area. Considerable work has been done in recent years in the control of Bang's disease. The use of pasteurized milk has steadily increased until today probably 80 percent of the fluid market milk is pasteurized. And last, but by no means least, official recognition of the importance of milk sanitation has led to the wider adoption of modern milk-control legislation and the organization of milk-control divisions not only in state health departments and in large cities but also in many smaller communities and rural counties.

With the last development the work of the U. S. Public Health Service is intimately related. Milk sanitation became a definite activity of the Public Health Service in 1923 when the preparation of a model milk ordinance was begun. Voluntary adoptions of the recommended ordinance have steadily increased; at present it is in effect in communities ranging in population from less than 1,000 to about 3,500,000 in 36 states. It has been adopted statewide in 1 state, and by 109 counties and 897 municipalities having a total population of over 23,000,000. It has also been adopted as state regulations by 18 states, but in these enforcement is usually left to the local communities.

Of even greater value than mere adoption of the ordinance were the measures instituted for promoting good enforcement. These include, first, the preparation of an interpretative code to standardize interpretation and enforcement. Next came the development of a uniform milk-sanitation rating program whereby states can measure the extent to which city milksheds comply with the requirements of the ordinance. The communities which are awarded a milk-sanitation rating of 90 percent or more by the states are published semiannually in *Public Health Reports*. This list is useful in acquainting areas experiencing a milk shortage with sources from which satisfactory supplies can be obtained, and is offered as a means for overcoming existing multiple inspections and trade barriers. Thirdly, the Public Health Service undertook to promote the organization of milk sanitation activities in state health departments. In recent years many states have been able to employ qualified milk sanitarians through funds made available by Title VI of the Social Security Act. The state milk sanitarians are offered training and technical assistance through the Washington office and through the Public Health Service district milk specialists. The state milk sanitarians, in turn, train local inspectors, provide consultation service to communities, and make milk-sanitation ratings. Finally, the Public Health Service has conducted many regional milk-sanitation seminars in collaboration with the states, at which state and local milk inspectors devote 5 days to an intensive study and discussion of the recommended program.

When construction of Army camps for selectees was begun in 1940, reconnaissance surveys of the public health organization and needs of each of the camp areas and of the war industry areas were made by the Public Health Service. In many of the areas in need of such organizations they have been established by the states with the help of personnel employed by the Public Health Service from Emergency Health and Sanitation funds appropriated by Congress. Mobile trailer laboratories of the Public Health Service stationed in some of the Army maneuver areas are rendering valuable service in examining milk and water samples where laboratory facilities are lacking. In addition, a bacteriologist of the Public Health Service is surveying milk laboratories in defense areas throughout the country with a view to obtaining closer compliance with the *Standard Methods for the Examination of Dairy Products* of the American Public Health Association.

AVAILABILITY OF MILK

As a result of these efforts many sections of the country where military camps and war industries are located have available supplies of fresh milk meeting the Type II No. 1 specifications. The Army milk inspectors obtain excellent and valuable cooperation from the local health units in the defense areas, from most state health departments, and from the district staffs of the Public Health Service. In fact, the Army depends largely on civilian milk control officials to determine compliance with its milk specifications, with occasional check inspections and samples by Army veterinary officers. It prefers to assume full control only where there is no alternative.

While present conditions are much more satisfactory than during the first World War, many problems still confront us in supplying adequate and safe milk supplies to military forces and war industry workers. The most serious problems are those related to the shortage of milk in certain areas, the difficulty of maintaining sanitary quality and control, and the shortage of critical materials for equipment and deliveries.

Never before has milk been more widely used in this country than it is today. The newer knowledge of nutrition has firmly elevated this most nearly perfect food to a stellar role in the national diet. Recognition of its value by our military authorities and by the rank and file of the armed forces has resulted in a greater per capita as well as a greater total consumption of milk and its products by our troops than at any other time in our history. At the same time improved economic conditions in centers of war industries have been accompanied by unprecedented increases in the demand for milk. Last, but not least, there must be taken into account the large shipments of milk in concentrated forms to our allies overseas. It is not to be wondered, then, that some sections of this country are experiencing a shortage of graded fluid market milk. The shortage is most serious in several southern states where concentration of troops is heaviest.

Different measures for remedying the shortage are being attempted. A milk production goal of 125 billion pounds (7 percent above 1941) has been recommended by the Secretary of

Agriculture for 1942, but actual production will fall 5 billion pounds short of this goal because of shortages of farm labor, trucks, and tires. For individual areas where present graded fluid milk supplies are inadequate, measures for relieving shortages include the promotion of increased production by existing market milk producers, the geographic expansion of existing milk sheds, the importation of surpluses from outside milk sheds operating under equivalent standards, the diversion of high grade milk now used for buttermilk, chocolate milk, and cream to fluid milk channels, and the elimination of returns from stores.

In some areas, however, Army and civilian fluid milk shortages can be relieved only by accepting for pasteurization milk that does not qualify for approval under rigid peacetime standards, as, for example, by diverting supplies from the better manufacturing producers or by importing surpluses from outside milk sheds not operating under similar regulations. Where shortages of graded milk are not severe, they may be overcome by issuing temporary permits to a few of the better manufacturing producers who may be able to qualify for grade A by improving their methods and without the use of substantial quantities of critical materials. Under present conditions a more lenient interpretation of construction and equipment standards and the acceptance of substitute materials are justified. For example, certain barn construction requirements might be waived for temporary grade A permits, or small milking parlors could be substituted for large milking barns, to conserve critical materials; wash vats in milk houses could be made of wood or cement slabs like those used for laundry tubs, instead of galvanized iron; and mechanical refrigeration should not be insisted upon.

Where shortages are severe, it will be impossible to obtain priorities for the large quantities of critical material that would be necessary to qualify hundreds of manufacturing producers for grade A permits. Even the temporary mislabeling of low grade milk as grade A would be repugnant to most health officers because it would destroy the work of many years in building up consumer respect for milk grading and milk control. They will insist that this milk after pasteurization be labeled as grade B or grade C or ungraded. To compensate for the use of lower grade milk it will be necessary to maintain safety and wholesomeness by careful control of the pasteurization process and through more sanitary methods on the farm. As long as such milk is available its use seems preferable to a program of milk rationing. Where a civilian milk shortage exists, or where the local Army authorities are willing to accept Type III milk, the shortage can be relieved in this manner without disturbing existing grading and grade labeling requirements. In some cases it may be necessary, however, to amend the local regulations for the duration of the war, so as to permit the sale of lower grades in the community and the processing of lower grades in grade A plants.

Certain Army authorities believe that the Army would be criticized if it procured for troops milk of lower grade than that available to the majority of the consumers in the nearby civilian community. Some post commanders refuse to accept Type III milk where there is a shortage of Type II, even though authorized to do so by the Quartermaster General's Circular Letter No. 377 of October 5, 1942. This matter was discussed at a conference called by Surgeon General Parran on October 5, with representatives of the Army Quartermaster Corps, Army Medical Department, War Production Board, Office of Price Administration, Agricultural Marketing Administration, and the Public Health Service. Following this conference Dr. Parran addressed a letter on October 10, 1942, to the state health officers of 17 states urging that steps be taken to relieve Army milk shortages. It is my understanding that the Association of State and Territorial Health Officers meeting here a few days ago adopted a resolution that such steps be taken without eliminating existing grading and labeling requirements.

Sanitary Quality

Another problem demanding attention is the difficulty of maintaining sanitary quality and sanitary control of milk supplies under war-time conditions. The unprecedented migration of many thousands of persons from their homes to new and sudden concentrations in military camps and war industry areas has created public health hazards of serious proportions. In many areas milk supplies for populations of a few hundred are being rapidly expanded to serve many thousands. Under such circumstances sanitary production and supervision become extremely difficult, and pasteurization becomes doubly important, Fortunately, the Army authorities are giving a strong impetus to pasteurization by purchasing only pasteurized milk for camp use. Many boys from raw-milk areas are learning to drink pasteurized milk in the Army and may insist on its use when they return to their homes. Shortages of labor, trucks, and tires will force many raw milk distributors to sell to pasteurization plants.

But pasteurization alone cannot be relied upon for ultimate protection when many experienced pasteurizer operators are being inducted into military service and are being replaced by inexperienced men and women who may have little or no background of milk sanitation. It is of utmost importance that the superintendent or chief operator of a pasteurization plant be familiar with pasteurization laws and regulations, with the operation of pasteurization equipment, and with the diseases that may be transmitted through milk. The 1942 report of the Committee on Milk of the Conference of State and Provincial Health Authorities indicates that only 3 states and about 10 cities require the licensing of plant operators, and that even in these places training facilities are usually not provided. The present rapid turnover in plant employees makes licensing more difficult but, by the same token, more necessary. State and city milk control officials are therefore urged to survey their educational facilities for the purpose of developing a training program for pasteurization plant operators with a view to future licensing of such operators.

A similar difficulty confronts us in maintaining sanitary milk production on the farm. Experienced milkers are being drafted for military duty or are enticed by the higher pay of war industries. Draft deferment of skilled dairy hands and freezing of jobs may become necessary. Even when replacements can be found, new milk handlers have little knowledge of sanitary production. The same situation obtains among the manufacturing producers who have switched to fluid milk markets, many of whom are concerned primarily with quantity rather than quality production. The problem has become acute in some areas where high competitive prices for lease-lend milk products have attracted producers away from the fluid milk market rather than make the necessary sanitary improvements. More than ever before concerted educational campaigns should be undertaken by all interested agencies to promote clean milk production. The Office of Price Administration will undoubtedly have to increase the price differentials between manufacturing milk and fluid milk, either through subsidies or by lifting price ceilings, in order to encourage greater diversion to fluid milk channels. Similar differentials will be necessary between grades in order to promote high quality production. Differences in price between neighboring communities will also re-

quire adjustment to eliminate pirating of supplies.

Milk control staffs, too, are being depleted by the Army, and their replacement with qualified inspectors is becoming increasingly difficult. Thus, at a time when public health supervision is needed most, it threatens to become least effective. The Public Health Service reconnaissance surveys of public health needs in defense areas in 46 states indicate that 70 percent of such communities need more adequate milk inspection and control. Here is an unparalleled opportunity for our schools and colleges to make real contributions to the national welfare. Courses of study for public health personnel could be expanded to comprise more milk sanitation, including details of pasteurization equipment. Conversely, courses in dairying given at agricultural colleges might well devote more attention to the public health aspects of dairy technology, so that graduates may be better qualified to fill both inspectional and manufacturing positions.

EQUIPMENT AND SUPPLIES

The third major milk supply problem posed by the war is the need for conserving critical materials for war purposes. The goals of greater milk production and maintenance of sanitary quality must be achieved in the face of a shortage of certain critical materials used in the manufacture of dairy equipment and in the transportation of milk. Unless satisfactory substitute materials are developed, it seems likely that equipment for expansion will not be available except for plants serving the military forces. Consequently, the proper maintenance of existing equipment becomes of paramount importance. This need has been recognized by the War Production Board in assigning an A-1-j preference rating to dairy equipment required for maintenance or repair, and an A-3 rating for operation and replacement materials, under order P-118. This order has been extended to December 31, 1942.* Equipment manufacturers are contributing toward the maintenance program by issuing maintenance manuals to their customers.

The War Production Board has sought the advice of the Public Health Service and of the International Association of Milk Sanitarians on matters related to the public health. In turn, the Public Health Service has urged health officers and milk inspectors to cooperate with the dairy industry and the War Production Board in the conservation of essential materials and in the acceptance of satisfactory substitutes. Milk control officials will have to relax their peacetime standards for dairy equipment during the emergency. Without question our primary goal must be to win the war. Nevertheless, as Surgeon General Parran has pointed out, "This is total war, the civilian is at the front with the soldier. Civilian health and strength are . . . essential to victory . . . Public health takes on a new urgency." As adequate and safe milk supplies are essential to the proper nutrition of the armed forces and civilian war workers, health officers will strive more than ever to improve the sanitary quality of these supplies. They cannot accept certain practices, suggested through selfish motives, that would jeopardize the essential safety of the milk supply but in which no critical materials are involved and for which no real need has yet been demonstrated.

The truck and rubber shortages have become quite critical and are seriously affecting retail milk deliveries. On April 20, 1942, the Director of Defense Transportation issued General Order No. 6 forbidding special deliveries and callbacks after May 15, and requiring after June 1 additional reduction in monthly delivery vehicle mileage of at least 25 percent of the corresponding 1941 mileage. Some dealers may be able to effect the required saving by resorting to horse and cart delivery, but this solution is obviously impracticable for the industry as a whole. It is not likely that dealers in many cities will voluntarily agree on consolidation of routes, combined deliveries, or zoning programs. Most cities seem to be headed toward every-other-day deliveries, although some health officers would prefer other methods of conservation. Every-other-day deliveries may result in increasing the age of milk, in some spoilage due to inadequate refrigeration, and in throwing an added burden on the already inadequate refrigeration facilities of stores; but these would be lesser evils than the complete suspension of home deliveries which would significantly lower milk consumption. With clean milk supplies and modern refrigeration, milk can be kept for many days, even weeks, without danger. Where the family does not have adequate refrigeration facilities for a two-day supply, milk for the second day can be purchased at the store. If necessary, stores can provide the increased refrigeration facilities required for handling their larger milk trade by improvising homemade wooden ice-boxes.

The O.D.T. order prohibiting callbacks forbids the deliveryman from returning to the same premises on the same day to pick up empty bottles, to collect accounts, or to solicit business. All of these functions must be performed at one visit, which must therefore be made during daylight hours. Customers who cannot arrange to have their milk placed in a refrigerator within a reasonable time after delivery should purchase their milk at the store.

Dating of milk is not provided for in the Public Health Service Milk Ordinance because the improved efficiency of pasteurization and refrigeration have reduced its value. In those cities which still enforce a dating requirement, compliance with the tire conservation order may be seriously impeded, particularly in the case of every-other-day deliveries. With special deliveries eliminated, stores retailing dated milk will either run short or have left-overs involving losses. Left-overs mean returns to the milk plant amounting to between 5 and 10 percent of store sales and cannot be reused for fluid milk, thus representing a financial loss and a possible loss of some of the milk constituents. During the present emergency such wastage is particularly undesirable. However, the most serious objection to dating is the temptation to surreptitious changing of bottle caps by delivery men and storekeepers. Hand capping under such conditions may contaminate the milk and must be considered a serious public health hazard. This practice cannot always be detected by even the most efficient inspection. Some markets employ a code system of some kind on the bottle cap which enables control officials to determine the age of the milk if that should become necessary for the purpose of tracing milk-borne disease. A code system has all of the advantages of dating without its disadvantages.

SUMMARY

To summarize, then, there has been a marked improvement in the sanitary quality of the milk supplies available to our armed forces and to workers in war industries since the first World War. Nevertheless, a number of problems still demand the concerted efforts of all agencies interested in milk quality. Among the important ones are the shortage of high grade fluid milk in certain areas, the difficulty of maintaining sanitary production and control, and the shortage of critical materials for equipment and deliveries.

* Order P-118, as amended November 12, 1942, assigns higher ratings, as follows: AA-2X for emergency maintenance or repair, AA-5 for normal maintenance or repair and for operating supplies, and AA-3 for replacements.

War-Time Ice Cream Problems*

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Our major production problems today might be classified as:

1. Labor;
2. Equipment;
3. Simplification of Production Schedule;
4. Ingredients and Supplies.

Labor

The labor situation, brought about by the Draft and the demand for labor at high wage levels in war industries, has become a serious problem in many communities. Other plants, more remotely located from war industries, have not as yet felt the impact of the situation. Many suggestions have been offered to alleviate the labor shortage; i.e., the hiring and training of women for plant work, the hiring of older men beyond the draft age, and part-time use of high school and college students. There can be no universal solution to the problem. In each instance, local conditions must be studied and the most made from the material available.

In discussing this problem with a plant manager recently, he stated that he had contacted every local organization with the exception of the jail and the insane asylum, and had not yet solved his problem.

On one point there is general agreement; i.e., versatile workers are more important today than ever before. The plant is in a precarious position indeed when it is dependent upon one particular worker for any specific job. The better plan is to train each individual for several jobs, thereby making him interchangeable throughout the plant. This, of course, may often be difficult in small plants, yet it appears to be the only safe course to follow.

With the keen competition for manpower, it is probably more important than ever to keep employees satisfied and happy in their work. A sound industrial relations program appears to be the only logical answer to the problem.

Equipment

The plant operator who is careless with his machine will soon have no machine to operate. Dairy equipment is now practically impossible to replace. Repair parts, for the most part, have been available, but the routine involved and the delays thereby necessitated make parts replacement burdensome, and particularly so when in flush production. With labor shortages, high labor rates, and high-priced ingredients, breakdowns are very costly. All effort expended to keep equipment running at maximum efficiency and to prevent breakdowns is money well spent.

The old adage, "An ounce of prevention is worth a pound of cure," was never more apropos than today. A capable engineer or mechanic, with an adequate staff in large plants, should be assigned to the job of maintaining equipment, making periodic check-ups, and handling greasing and oiling on a regular schedule. At the 1942 rate of production, much equipment will not last for the duration unless it is given the best possible care.

Any discussion of equipment, however brief, would not be complete without reference being made to sanitation. With the scarcity and heavy turn-over of help, proper clean-up often presents a real problem. With all the advancement that has occurred in dairy equipment improvement and design, it seems that nothing much has been done to help the clean-up crew. It is true that modern machines can now be completely disassembled, but the number of parts to be cleaned is tremendous. Nothing can be done about machine design at this time, but this is a subject which merits the consideration of our best dairy engineering brains.

Because of the nature of the clean-up job, it usually falls to the lot of the newest and least experienced employee to do this work. Whether or not this is sound can, of course, be argued pro and con. There would be little inducement for an employee to work up from a freezer man to a clean-up man. Possibly, we should glorify the job and give it a title; i.e., "Plant Sanitarian."

Regardless of our "wishful thinking" about simplified design and titles, with conditions as they are, many plants will have to depend upon relatively inexperienced help for clean-up. This places an extra responsibility on supervision. It is very important that these individuals be provided with the necessary equipment and supplies and be taught how to do the job. Then after they are taught, they should be followed to see that the work is properly executed.

The proper care of sanitary pipe and fittings was never more important than today. Hammering and carelessly dropping pipes and fittings will surely lead to their ruination. Nothing is more unsightly, or inexcusable, than cans placed under fittings to catch the drip.

Simplification of Production Schedule

The industry as a whole appears to have fallen in line with the suggestion to reduce flavors, eliminating from their line the slow-moving items. A general policy of carrying seven to ten flavors at a given time has been adopted.

While this policy appears to be generally sound, and certainly should assist in relieving the labor and supply situation, it may serve as a boomerang so far as some of the flavoring ingredients are concerned. Items such as chocolate and strawberries, which will be discussed later, may be called upon to flavor an abnormally high percentage of the ice cream produced. Since the stocks of these items are short, this may result in an early depletion of these flavoring ingredients. The strawberry pack now appears to be in the hands of the users; so there will probably be no more available before the new crop. Chocolate appears to be getting scarcer daily.

Thus, while operating on a schedule of reduced flavor varieties, it will probably be necessary to change the assortment often, probably removing some of the usual staples from the market altogether from time to time.

The limiting of novelties and specialty items, wherein the man-hour production is quite small as compared with bulk and package production, appears to be sound at this time. Many manufacturers have reduced the novelty assortment to one, and have discontinued specialty items; i.e., cakes, rolls, tarts, etc., altogether.

Ingredients and Supplies

Dairy Ingredients. Reported shortages of dairy products for ice cream manufacture have been "spotty" and temporary in nature. In some territories, especially those close to large army cantonments, the unprecedented demand for fluid milk has necessitated the drawing of supplies for ice cream manufacture from a considerable distance. The milk flow has, however, been heavy, generally providing for all requirements. The principal problem has been that of distribution.

* Presented at Michigan Dairy Manufacturers' Conference, East Lansing, Michigan.

There are now several factors pointing toward possible restrictions on or shortages of dairy products. The labor problem is becoming acute in many dairy regions, causing some dairy farmers to go out of business. Further, there is a growing demand for skim milk powder for lend lease and other governmental agencies. The surpluses of butter and cheese are rapidly disappearing. We are also faced with the probability that prices of dairy products will be controlled by ceilings and the possibility that butter fat will be rationed. It would seem, therefore, that the dairy ingredient problem in 1943 will probably assume enormous proportions.

Sugar. The allotment of sugar at the varying percentages based on 1941 usage has fostered much sugar research and changes in ice cream formulation. Out of this work has come the realization that corn sugar, corn syrups, and corn syrup solids can be used in considerably greater quantities than had heretofore been considered good practice. The corn sugar industry has been able to fill most of the gap between the allotted cane and beet sugar and production requirements.

Invert sugar has been quite successfully used by some manufacturers, in combination with cane or beet and some of the corn sugar products. The actual gain in sweetness effected through the acid inversion of cane or beet sugars continues to be a controversial point. Gains ranging between 4 percent and 40 percent have been reported. We have found that when sugar is 95 to 100 percent inverted, as can be effected practically in plant operations, and is used in the mix in combination with cane or beet sugar and corn syrup or corn syrup solids, an increase in sweetness of 23 to 25 percent results.

The inversion of sugar is not the formidable task it might seem. When stainless steel or glass pasteurizing vats are available, sugar can readily be inverted using either tartaric, citric, phosphoric, or C.P. hydrochloric acids. It is necessary to acidulate the sugar syrup to approximately pH 2.0 to 2.5 and heat for 1 to 1¼ hours at 190 to 200° F.

As reported by Dr. P. H. Tracy,[1] most manufacturers have reduced the sweetness of their ice cream to about 13 percent (sucrose basis). This has further assisted in spreading the available sugar over a greater gallonage.

Another means of coping with sugar scarcity has been suggested by Leighton and Williams[2] of the Bureau of Dairy Industry, U. S. Department of Agriculture. They report a definite correlation between sweetness and the sugar-water ratio in the mix. They have found that a satisfactory sweetness can be maintained with one part sugar to five parts water in the mix. Thus, by reducing the moisture content of the mix, which must be compensated for by increasing the solid constituents and the air in the drawn ice cream, and by maintaining the 5 to 1 water-sugar ratio, the sugar content may be decreased considerably and the ice cream still taste satisfactorily sweet. As an example, cited by the authors, an ice cream frozen from a properly balanced mix of 83.75 lbs. containing 9.75 parts sugar, drawn at 139 percent overrun, will taste as sweet as a product frozen from a 100 lb. mix of similar composition, containing 13 parts sugar and drawn at 100 percent overrun. Furthermore, since air is being substituted for water, the food value per gallon of finished product will be the same. Such a practice would be prohibited in those states having weight laws for ice cream. This idea is new, and to my knowledge, has not been practiced commercially to any extent. However, it does merit consideration in case of acute sugar shortages.

Chocolate. The current allotment of 60 percent of the 1941 usage of chocolate products to the ice cream industry is being felt in both chocolate ice cream and bar production. Unfortunately, a substitute for chocolate has not been found. There are, however, ways of spreading the use of the available chocolate over a greater volume of product.

In chocolate ice cream, the chocolate flavor intensity is dependent upon the chocolate to sugar ratio in the mix. The trend over the past few years has been to produce chocolate ice cream with a sugar content four to six percent higher than that of plain mix. A saving of 25 percent to 30 percent of the chocolate or cocoa flavoring products can often be effected by adjusting the sugar content of the mix downward, and without materially changing the character or flavor intensity of the chocolate ice cream.

Flavor boosters are also being used to a limited extent to intensify the chocolate flavor.

The coverage of chocolate coating for ice cream bar production is being increased in a number of ways. Domestic oils, specifically processed for the particular purpose are successfully replacing cocoanut oil as a chocolate thinner, and are making it possible to increase bar coverage. These oils are being used to thin down slab chocolate, both the regular dipping chocolate and enrober types, and also to thin further the prepared liquid coatings.

Butterscotch, caramel, and peanut flavored, as well as unflavored coatings, are successfully replacing a sizeable part of the chocolate coating deficiency. Every conceivable means of spreading the usage so as to take care of current volume is being employed.

Indications are that the chocolate situation may become worse. Reports indicate that 1942 bean imports total only approximately 20 percent of importations of 1941. Under our 60 percent allotment, we are rapidly using the available product.

Fruits and Nuts. The fruits and nuts of domestic origin seem destined to assume a more important role as flavoring ingredients. These flavors will probably largely replace many of the imported flavors.

The heavy demand for fruits and the comparatively light crop in many localities has resulted in a light pack. Government restriction on sugar in the pack, reducing most fruit packs to a four plus one basis, has also made it necessary to revise many formulas.

The heavy demand for and scarcity of the popular fruits will undoubtedly encourage many manufacturers to use the less commonly used fruits in greater abundance.

Stabilizers. With the less frequent delivery of ice cream, and in many localities, the increased use of common carriers for transportation, adequate stabilization of the mix is more important than ever. It is fortunate that ample stocks of the common stabilizers have been available and manufacturers appear to be in a good position to take care of future demands. While there has been an unprecedented demand for gelatin by many branches of the food industry, production has been expanded. Shortages reported have been of only a temporary and local nature. According to government reports recently released, gelatin production in 1941 was 106 percent over 1932. The first six months of 1942 show an increase of 15 percent over the corresponding period of 1941.

The stock of locust bean gum, which has been widely used as an ingredient of stabilizers used in sherbets, ices, and marbleizing syrups has been practically depleted. Other gums of vegetable and marine origin have been found to adequately replace locust bean gum.

Vanilla. The vanilla flavor situation does not appear to be improving, due to the scarcity of vanilla beans and vanillin. Coumarin has now been withdrawn from the market.

The current Mexican bean crop is reported as short, while few other beans are entering this country. The need for chemicals used in the normal production of the fortifying and syn-

thetic ingredients is eliminating some products from the market altogether and limiting the production of others. There is, therefore, a very real threat of shortage of all types of vanillas.

The trend over the past year appears to have been toward an increase in the use of powdered vanillas and fortified vanillas of all kinds. Apparently, two motives are behind this trend; namely, (1) the desire to extend the use of the available vanilla beans over a broader gallonage, and (2) the need for a higher-flavored vanilla to cover up the flatness or syrupy flavor that often results from the excessive use of corn sugar products. This latter problem is one that has been quite general, due to the widespread and heavy use of corn sugar products.

There was never a time when research was more important in the conduct of an ice cream business than now, for certainly, changes of a major magnitude should not be made until thoroughly proven by test. We can make many modifications with the materials and supplies at hand, but this usually entails a very delicate balancing of the mix. Such changes are much too important to be left to chance or guesswork.

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1. Tracy, P. H. Wartime Production Problems. *Ice Cream Trade Journal*, Aug., 1942, p. 33.
2. Leighton, Alan, and O. E. Williams. A Method for Saving Sugar in Ice Cream Manufacture. *The Ice Cream Review*, Sept., 1942.

HARDNESS OF TIN-BASE ALLOYS

Methods are announced for obtaining new and stronger tin-base alloys suitable for use as bearing metals.

The effect on hardness, produced by quenching from the highest practicable temperature followed by prolonged tempering at 100° C. and 140° C., has been examined for 80 tin-base alloys containing 4 to 14 percent antimony and 0 to 10 percent cadmium. The results of the hardness tests are recorded in a paper by W. T. Pell-Walpole, B.Sc., Ph.D., in the *Journal of the Institute of Metals*, Vol. 68, October 1942.

It is shown that these alloys can be hardened by heat treatment and maintain a useful degree of improvement for at least 1,000 hours at 100° to 140° C. The best alloys in this respect are those in the range antimony 9 to 10 percent, cadmium 1 to 1½ percent, balance tin. The degree of improvement is indicated by Vickers diamond pyramid hardness tests. Values of 33 to 34 are obtained, compared with values of 26 to 30 in the normal non-heat-treated condition.

Conservation of Power Through Efficient Operation of Refrigerating Equipment*

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IN order to understand efficiency in operation of refrigerating equipment, a knowledge of a few basic definitions are necessary.

(1) A ton of refrigeration is equivalent to the melting of one ton of ice in 24 hours. Numerically this may be stated as 288000 Btu of heat absorption in 24 hours or at the rate of 200 Btu per minute. The following operating conditions have been set up by the American Society of Refrigerating Engineers to complete the definition:

(a) A 5° F. inlet or suction temperature for saturated vapor
(b) An 86° F. outlet or discharge temperature for saturated vapor
(c) A subcooling of the liquid entering the expansion valve of 9° F. or a temperature of the liquid at the expansion valve of 77° F.
(d) A superheating of the vapor entering the compressor of 9° F., or a temperature of gas to the compressor of 14° F.

While parts c and d of this definition are technically correct, they nevertheless tend to complicate somewhat an application of the definition to commercial operations. It is easier for the layman to ignore the effects of subcooling of the liquid entering the expansion valve and the superheating of the vapor entering the compressor. Disregarding these items will have the general result of lowering the refrigerating effect of a pound of ammonia from approximately 490 Btu to 474.4 Btu. The net result will be a somewhat higher capacity than the theoretical calculation. There is no harm in this because it is always best to err on the side of safety.

(2) The rated capacity of a compressor in a refrigeration system may be determined by means of the following general formula:

$$\frac{\pi r^2 \times L \times C \times N \times E}{D}$$

Where $\pi = 3.1416$
r=radius of cylinders expressed in feet
L=length of stroke in feet
C=number of cylinders in compressor
N=number of strokes per minute
E=volumetric efficiency of compressor expressed decimally
D=cubic feet of saturated refrigerant which must be displaced per minute per ton of refrigeration at standard conditions.

In the above formula the factor "D" is capable of greatest variation in the operation of any given machine. The value of "D" can be derived from the equation in the following manner:

$$D = \frac{200 \times \text{Specific volume of refrigerant at the operating suction pressure}}{\text{Heat of vapor at the operating suction pressure} - \text{Heat of liquid at the operating discharge pressure}}$$

"D" represents the per minute volumetric displacement of the pistons in cubic feet per minute.

For an ammonia machine operating at standard conditions "D" will have the following value:

$$\frac{200 \times 8.15}{613.3 - 138.9} = 3.43 \text{ cubic feet per minute}$$

* Condensation of paper presented at Michigan State College Dairy Manufacturers Conference, East Lansing, Nov. 5, 1942.

For a Freon machine operating at standard conditions the value of "D" becomes

$$\frac{200 \times 1.49}{78.8 - 27.7} = 5.83 \text{ cubic feet per minute}$$

A practical application of the last illustration indicates that *any given machine should be operated at the maximum possible suction temperature* (pressure) *which will still give the desired temperature to the product to be refrigerated.* The relationship of suction pressure to output and to power consumption is expressed graphically for ammonia in Figure 1. The figures for cubic feet of ammonia to be pumped per minute have been corrected for volumetric efficiency, and are therefore greater than the theoretical value for "D." The horsepower per ton, on the other hand, is theoretical and will have to be multiplied by a figure which will vary from 1.2 to 1.5 in order to estimate the actual horsepower. A careful study of Figure 1 indicates how much more it will cost for power if the compressor is operated at a lower suction pressure than necessary. A machine rated at 10 tons and operating about 10.0 hours at 35 lbs. gauge (suction) pressure will have a power cost of approximately $1.00 per day at 2 cents per K.W. If the same machine were operated at 15 lbs. gauge (suction) pressure it would have to operate about 17 hours. The cost would then amount to $2.50 per day. Over a period of one year the saving would amount to roughly $550.00.

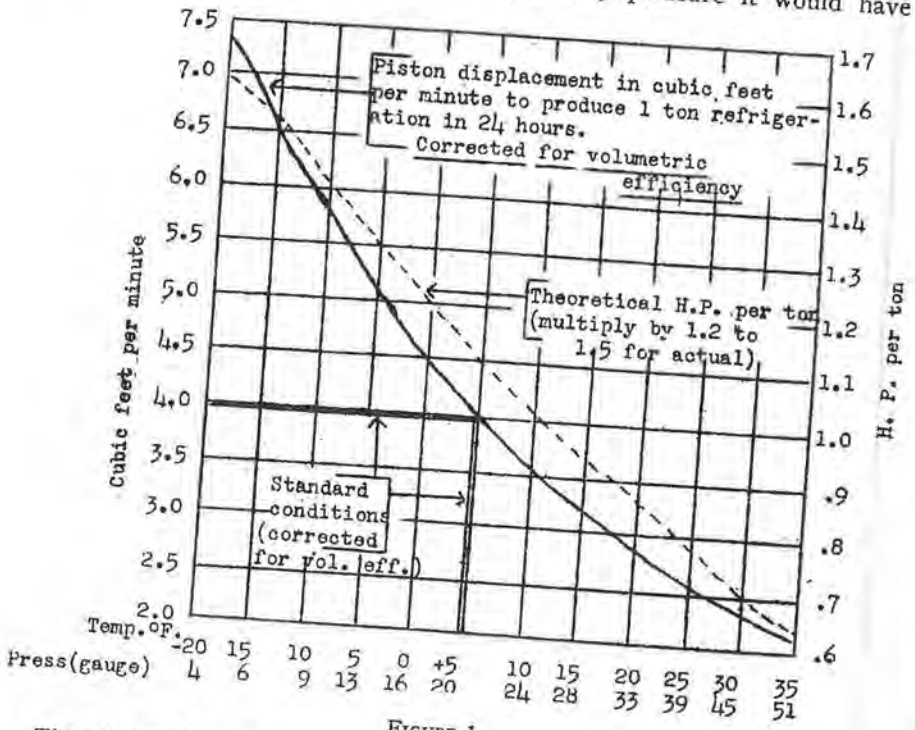

FIGURE 1

The relationship of suction pressure to output and to power consumption for ammonia compressors.

Discharge pressure in all cases 155 lbs. gauge (86° F.).

Sometimes a machine can not be operated at its optimum suction pressure because the surface area of the expansion unit is too small, or the velocity of the air, the water, the brine, or the dairy product over the expansion surface are too low, or the refrigerant within the expansion unit is moving too slowly, or the condition of the heat exchanging surface may be unsatisfactory because of oil, scale, or frost which may be present.

Where any of the conditions mentioned are capable of being remedied, the necessary corrective measures should be taken at once.

Discharge pressures may be higher than warranted as a result of the presence of non-condensable gases in the system, oil coatings on condensing surfaces, scale or sludge on the water side of the condenser, location of condenser in a very warm room, condensing water too warm, an insufficient supply of condensing water, or a condenser that is too small.

Figure 2 was prepared from selected tables in order to indicate the effect of discharge pressures on power required per ton of developed refrigeration, if the suction pressure remains constant. In this case a suction pressure of 20 lbs. gauge was used. Similar graphs might be prepared for any number of other conditions.

We should avoid hasty conclusions when interpreting the graph in Figure 2 because an unusually high discharge pressure may be the result of a deliberate attempt to economize on water. When that is the case the saving on water costs may offset increased power costs. On the other hand, when high pressures are the result of faulty operating conditions which might be remedied, then we are guilty of wasting

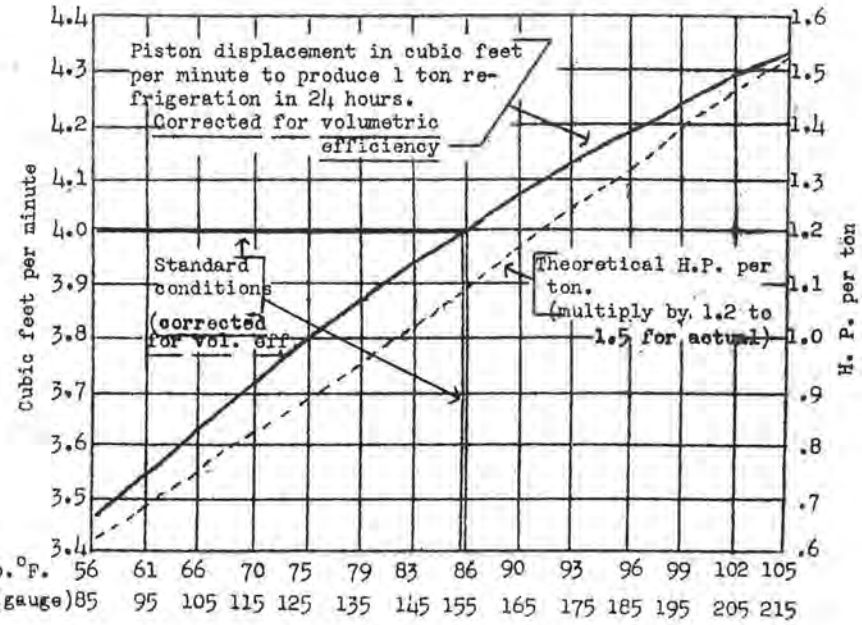

FIGURE 2

The relationship of discharge pressures to output and to power consumption for ammonia compressors.

Suction pressure in all cases 20 lbs. gauge (5° F.).

power, at a time when such waste cannot be condoned.

If a machine rated at 10 tons were operated at 145 lbs. gauge discharge pressure and 20 lbs. gauge suction pressure for approximately 10 hours daily, that same machine would have to operate about 11 hours daily at 195 lbs. gauge discharge pressure and 20 lbs. gauge suction pressure to produce an equivalent amout of refrigeration. At 2 cents per K.W., the power cost in the first case would amount to about $1.20 per day, whereas at the higher pressure and longer operating period the cost would be approximately $1.80 per day. If this increased discharge pressure were due to correctible operating conditions the saving in power over a period of one year might amount to $220.00.

Further operating economies may be effected by properly belanced operating conditions, and by checking insulation, brine, carelessness in the use of refrigerating rooms, etc.

A Hospital Epidemic of Flexner Dysentery Caused by Contaminated Ice. E. J. Gofrey and M. A. Pond. Jour. of the A. M. A., *114*, 1151–4 (Mar. 30, 1940). *Pub. Health Eng. Abs.* xxi, W, 64.

An outbreak of 60 cases of Flexner dysentery among hospital personnel is discussed. The epidemiological and sanitary surveys traced the epidemic to careless handling of ice by 1 woman who had contracted the infection. This woman was the first of the 60 patients in the outbreak.

C. L. CAMPBELL

Papers Presented at the First Annual Air Conditioning Short Course. Bul. of the Agri. and Mechan. College of Texas, *10*, Bul. No. 49, 72 pp. (Dec. 1, 1940). *Pub. Health Eng. Abs.* xxi, IH, 13.

A series of 8 papers on comfort, research, controls equipment, air flow, heat gains, and trouble shooting by engineers in the manufacture, installation, maintenance, and operation of air-conditioning equipment.

P. J. A. ZELLER

Washing Facilities for Food Handlers on Ships. G. C. Sherrard. Public Health Reports, 55, 2319–2323 (Dec. 13, 1940). *Pub. Health Eng. Abs.* xxi, Mi, 19.

Epidemiological investigations of frequent cases of intestinal disturbances among passengers and crews on vessels arriving at the port of New York have directed suspicion to food handlers as the possible source of infection. Of 240 American vessels surveyed, 97 or 40 percent had hot and cold running water in pantries for the use of food handlers. The percentage of vessels having like facilities in the galleys and quarters is only slightly less. Nineteen percent of 394 foreign vessels surveyed had both hot and cold running water in the pantries. In addition to the lack of cold and hot running water approximately 25 percent of American and 50 percent of foreign vessels had no running water available in at least one of their food handling compartments, it being necessary to carry water from an outside source into the galley or pantry. Hand towels were found to be lacking in galleys or pantries of slightly over one-half of both American and foreign vessels. Where towels were not provided, the food handlers used either the dish cloth, their aprons, or trousers. Soap was found present in more instances than were the other facilities. Because of the absence of sanitary facilities and instruction of personnel in hygiene, it must be assumed that the path between ship's toilets and table food is frequently lacking in sanitary barriers. For correction of this defect 3 general measures are suggested.

(1) The installation of adequate and conveniently located washing facilities in galleys, pantries, anl food handlers' quarters on new ships during construction.

(2) The installation of like facilities, especially in the galley and pantry, on ships already in operation but which do not now provide such facilities, due consideration being given to the economic aspects, especially as regards the type of vessel, and trade in which it is engaged.

(3) The education of owners, operators, officers, and crews of vessels relative to sanitary precautions to be taken by food handlers, and the hazards to health when such precautions are neglected. Special emphasis should be placed on the esthetic aspects of the subject.

A. J. KRANASKAS

The Importance of Cooperation Between the Milking Machine Industry and the Milk Sanitarian in Milking Machine Sanitation*

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AT the present time there are over 20,000,000 dairy cows that must be milked night and morning. The milk must be removed or secured from the cow through tiny ducts in the teats by some unnatural method either by hand or the mechanical milker. Regardless of which method you use, so many squeezes have to be made to remove the milk from this highly developed mammary gland of the present-day dairy cow. A few years ago at Cornell University it was found that it required an average of 1,235 flexes or hand squeezes to milk an average cow. Let us say it takes 1,000; therefore to milk 10 to 15 cows night and morning, it would require the average milker to make 30,000 flexes or squeezes. No wonder a person's hands get tired and that people get tired of hand milking. A milker who becomes discouraged or whose hands become crippled will not milk a cow properly. A mechanical milker never becomes tired but will milk the same way every day, twice a day, 365 times a year which is very important in proper milking.

From the recent works of Petersen, Ely, Miller, Turner, and others we have learned that milk secretion and milk ejection are not synonymous, but both are very important in harvesting this vital crop of milk. Ely and Petersen in their work on "Factors Involved in the Ejection of Milk," suggest that the positive act of "letting down" milk may best be explained as a conditional reflex and directly due to a high intraglandular pressure caused by the presence of active oxytocin in the blood stream which causes the musculature of the alveoli to contract. If this principle is true, the milking operation should not take longer than five minutes. If a longer period is taken to milk, the tiny muscle cells surrounding the alveoli will tire and thus will prevent the squeezing out of the milk droplets from the small alveoli into the larger cisterns of the udder.

Proof has been furnished that rapid milking is conductive to larger milk flow while a prolonged milking process, change of milkers, or irregularities in milking time are causes of lowered production. A tremendous sum of money is lost each year due directly to poor milking practices which result in lower production, unhealthy udders, and low quality milk. This is a fact that is seldom recognized by the dairyman himself and occasionally not recognized by those promoting better milking practices.

It can be plainly seen that the harvesting of this valuable crop is a great problem of the present dairy farm. It is not the ambition of the young men interested in agriculture today to become adept in the art of good hand milking. It is becoming a lost art. The young man on the farm is more interested in operating mechanical equipment as this is the age of mechanized farming. Hand milking requires more man hours than any other one

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* Presented at the 15th annual meeting of the New York State Association of Milk Sanitarians, Buffalo, September 24, 25, and 26, 1941.

job on the farm and is one of the last to become mechanized.

Why has it taken so long? First, the mechanical milker is the only machine that is attached to a living animal and required to perform a very delicate operation twice a day every day. Engineers have been able to solve many problems and accomplish things that once seemed impossible, but when they had to consider the delicate physiological secretion and ejection of milk they had problems to consider other than the sanitary construction of the machine. Second, the dairy industry, sanitarians, and manufacturers were not unanimous in their opinions that it was the best way to milk a cow. Milk sanitarians have been reticent about endorsing milking machines as they are an added piece of equipment to keep clean and may be a serious source of contamination if not properly cared for. Others have believed that milking machines were the cause of mastitis. They may act as mechanical carriers of infection the same as the milker's hands, if adequate precautions are not taken.

Milking machine dealers or their representatives should instruct the user on the importance of using the strip cup to determine the physical condition of the milk of each cow before the machine is applied. All animals secreting abnormal milk should be milked last, and the machines sterilized before being used for the next milking. Dipping of the teat cups in clean water to rinse off the droplets of milk and in a chlorine solution of 250 parts per million to sanitize them between cows is just as important as for the hand milker to wash his hands. As soon as the cows have been stripped the teats should be immersed in a chlorine solution of 250 p.p.m. to rinse off the moistened end of all milk. If the milk is allowed to remain on the teats, it might act as food for bacterial growth. If these suggestions are made conscientiously by the milking machine dealer, it will aid the dairyman in producing a higher quality milk and maintain healthy udders.

The general attitude toward milkers today is much more favorable. Everyone is beginning to see that milking machines can and will take over the huge task of milking the dairy cows. Recent work by investigators has shown that production will be maintained throughout the lactation period when the cows are milked by machines in four or five minutes. There is a tremendous task awaiting us to instruct the farmer properly on the correct methods to milk the modern dairy cow. The consuming public is eager to believe that their daily quart of milk has been produced under the most sanitary conditions.

Even today milking machines are considered a standard piece of equipment on both the large and small dairy farms. They have made it possible for farmers to have larger herds without additional help and also for the small farmer to milk his cows when help is not available or is too costly. They are receiving the endorsement of the milk sanitarians who realize the importance of better milking practice in relation to healthy udders and clean milk of low bacteria count when properly handled and cared for.

Today the country is confronted with a great shortage of labor, and for this reason many mechanical milkers are being sold. In some instances dairymen have purchased them from necessity and may therefore be said not to be milking-machine minded. It will require considerable time and patience to educate them to handle properly and care for their machines. During the last war emergency there were thousands of milkers sold, and some were not designed to milk adequately or to be cleaned properly. In most instances the dairymen did not receive proper instructions as to their care and use. As a result, many of these machines were discarded as soon as hand milkers were available. The unsatisfactory results experienced by these dairymen

proved to be a real sales obstacle when machines of proper construction were first put on the market.

Today the question which is uppermost in the minds of the dairymen, sanitarians, and milking-machine dealers is milking-machine sanitation. For the past twenty years many bulletins have appeared on how to care for milkers. All methods may be used successfully as has been proved by experiment and by actual use on the farm. Some methods have been severely condemned by inspectors and health departments due to misinterpretation by the dairymen or by their accepting incorrect advice from unscrupulous milking-machine agents.

Many efforts have been made to make and enforce uniform rules but all have met with failure due to climatic conditions, lack of uniform facilities, and the wide variation in the human element. However, there is uniformity of opinion that all milkers should be kept clean. It is necessary that general rules and regulations should be set up to act as a guide for the sanitarian and dairyman but neither should be criticized if favorable results are obtained by modification or slight changes in methods. The efficiency of a sanitarian is many times measured by his ability to interpret regulations and gain his objective without creating an unfavorable situation.

The sanitarian and milker agent or dealer should work together and have closer cooperation. Their interests are closely related and they should work as a team in meeting this problem. In the past there has been practically no cooperation between the sanitarian and the dealer, except in isolated cases. A complete change of attitude on the part of the inspector and dealer is what is most needed. At recent meetings in New York of representatives from the dairy industry, health departments, and milking machine manufacturers, a great deal was accomplished in creating a more favorable attitude toward our common problem of milking-machine sanitation. A set of rules was set up which was agreed to by everyone. These will serve as a guide for dealer and sanitarian to instruct the dairyman on how to keep his milker clean. This is the first time the industry, health departments and manufacturers have ever had a meeting to discuss problems of paramount importance to all three.

The first responsibility rests with the dealer who should know the sanitary requirements in that section so as to include all regulations pertaining to that market. The methods used should actually be demonstrated to the farmer by the dealer. He should be so efficient in his demonstration that he leaves no doubt in the mind of his new user on how to care for his equipment. Several routine check-ups at definite intervals should be made as a service until the new user has become correctly trained in caring for his machine. The successful milker agent will make a careful survey of the facilities for keeping the milkers clean and make his recommendations for purchasing wash vats and hot water heaters if necessary. The purchase of these conveniences is not positive assurance that the dairyman's equipment will be kept clean and it again reverts back to the dairyman being taught how to use his cleaning equipment to advantage. In some instances it may not be practical for the dairyman to use hot water for sterilization if the heater is not capable of heating the water to near the boiling point. Many are not large enough to heat a sufficient volume for both washing and sterilizing. These are important factors which should be brought to the dairyman's attention. The milking-machine dealer today is cognizant of the fact that it is important to please the fair-minded inspector as well as the dairyman in order to have happy and satisfied users.

The next important step is the first visit made by the inspector after the milker is installed. If the milker is found clean naturally the sanitarian is pleased. If the inspector finds the

milker in an unsatisfactory condition, he will warn the dairyman that the machine must be kept in a better condition or he will have to stop using it or the milk from his dairy will be excluded. Every milkman knows that this sort of threat is necessary in certain cases and it may be the only language that shiftless dairymen can understand. To the majority of dairymen, however, it is distasteful and puts them on the defensive. Many dairymen have complained that the inspectors discourage them by telling how they can expect their bacteria counts to be much higher and how difficult it will be to keep them clean. This would not happen if the inspector would say, "If you will give the milker a fair chance and give it immediate attention after each milking, it will not be a cause of high bacteria counts."

Milking-machine users must be worked with individually rather than collectively when correcting objectionable methods relative to their washing procedure. Ninety-nine percent of the inspections of dairy farms are made during the day between milking times. The sanitary condition of the utensils can be seen but the methods used can not be determined unless the inspector is present at the time of cleaning. One inspection at the time the utensils are being cleaned is worth a thousand at any other time. The old method or routine of inspecting dairies is being replaced by new or more modern ways of inspection, to determine how many unsatisfactory dairies can be made passable.

There are three important steps in keeping a mechanical milker clean. The first step is the most simple, but the most difficult to get the dairyman to carry out; that is, the immediate rinsing of each unit with a pailful of clean cold water as soon as it has been removed from the last cow and the milk dumped. For every minute that elapses between the time the pail is emptied and rinsed, it is a hundredfold harder to remove the remaining milk film. If the cold water rinse is used correctly the job of keeping the milker clean is practically completed. Some investigators are advocating the use of a detergent in the cold water rinse with encouraging results. Most farmers rinse the milker out after the cows have been fed or after other small chores have been completed, and call this immediate rinsing. The efficiency of the cold water rinse has been lost as the milk residue has already hardened on the milk surfaces of the equipment.

The second important step which has been sadly neglected in the past and which must be given more attention and perhaps to the detriment of the magic word "sterilization" is the proper removal of the thin film of butter fat, albumen, and casein which adheres to the surface of milk utensils. One of the most common objections found in milking machines has been the formation or collection of calcium phosphate or milkstone on the milk surfaces of the pails and rubber tubing. This condition has been encountered, regardless of the method used to clean milkers. Milkstone is generally accepted as an indication of improper cleaning due to a combination of milk film incorporated with lime deposits from the use of calcium hypochlorite and salts from hard water. Discoloration or deposits may occur and develop more readily in some machines due to water in that locality containing a higher proportion of mineral matter. Milkstone causes the surface of the utensils to become rough. This makes it difficult to sterilize the utensils properly with chlorine as the bacteria are embedded in the suspended material. Detergents which are composed of trisodium phosphate, sodium hydroxide, sodium carbonate, or sodium metasilicate may cause discoloration when used under certain conditions.

Mallman and Bryan report that when sodium metaphosphate is used in a detergent mixture it prevents the formation of milkstone on both the metal and rubber parts of milking machines. The sodium metaphosphate acts as a water normalizer thus preventing the formation of insoluble alkaline salts and soaps.

The frequent replacement of brushes is also very important and necessary. There is nothing better than the combination of a good brush, dairy powder, and brushing after each time the machine is used. A milker not properly taken care of after each milking becomes a dirty milker. Already evidence is building up to show that a physically clean milker will produce a low count milk if the rubber and metal surfaces are smooth and free from all deposits. This also holds true with thermoduric bacteria as they are not a source of trouble in a physically clean machine.

The third important step is the rinse or sterilization of equipment after washing. In the past, dairymen have been led to believe that many of the chemical sterilizers would work like magic in destroying all living organisms whereas actually the efficiency of all chemical sterilizers is directly in proportion to the efficiency of the first two steps. Hot water, if available in large enough quantities so that at least two gallons of 180° F. water can be sucked through each unit, is satisfactory to produce a commercially sterile machine. The same water should not be used for more than one unit. The hot water method of sterilization has several advantages; it not only sterilizes but also dries the equipment and keeps it bright, particularly so when tinned steel pails are used, and due to wartime emergency many tinned steel pails will be used in the future. The units may then be hung up dry as bacteria do not grow on a dry surface.

The solution rack provides the most efficient and economical means of using chemical sterilization. It should always be borne in mind that the solution rack is not a substitute for proper cleaning. The units must be absolutely clean before chemical sterilizers are effective. Chlorine is an excellent sterilizer if used on clean equipment. Its efficiency is in direct relation to thoroughness of the first two steps of rinsing and brushing the equipment. Chlorine should be used to flush out the rubber parts when lye is used in the solution rack.

Lye solutions are recommended as they have the following advantages:

Lye is more readily obtainable.

It retains its strength better both in solid form and in solution.

Lye solution does not deteriorate as rapidly when in contact with rubber or other organic matter.

A solution of the correct strength is more readily obtained.

Lye is cheaper (soak solution costs less than 1.25 cents per gallon).

Lye dissolves casein and saponifies or emulsifies fat, leaving the tubes free from grease and slime.

It avoids the granular deposit reported by Parfitt when chlorine compounds are used with hard water.

It has a beneficial effect on the rubber parts.

Lye is much more effective than chlorine compounds in the destruction of coliform organisms.

It is not a difficult task to draw up rules and regulations on how dairy equipment should be cared for and cleaned. The real task is in selling the producer or in training him to carry out these instructions. His knowledge of bacteriology is limited, and what he can not see is difficult for him to understand. An efficient sanitarian is capable of doing this, for it was once said that an inspector was judged by the number of clean milkers in his territory and it might be likewise said that the successful milking machine dealer or manufacturer is not determined by the number of machines sold but by the number of satisfied users.

At a meeting held in New York City on July 16, representatives of the New York City Department of Health, the milk industry, and milking machine manufacturers decided on the following uniform rules to be used as a guide for the proper instruction on the care of milking machines.

It was suggested, in those cases where the industry inspector finds a

producer having trouble in keeping his milking machine clean, that the inspector contact the district representative of the manufacturer of that particular milking machine so that the representative may call on the producer and instruct him as to its proper care. All of the representatives of the milking machine manufacturers present agreed to the following procedure:

1. Rinsing and brushing of milking machines *immediately* after the last cow has been milked; rinsing and brushing the milking parts and pails with clean, cold water, using one twelve-quart pailful for each unit.

2. Disassembling of milking machines. The milking machines should be disassembled sufficiently to wash and brush thoroughly with hot water all parts coming in contact with the milk immediately after the rinsing and brushing with clean, cold water process.

3. Reassemble and rinse with clean, hot water using one-half a pail or six to eight quarts, for each unit.

4. STERILIZATION: All milking machine pails and metal and rubber parts coming in contact with the milk must be sterilized by one of the following methods:

(a) Hot water of a minimum temperature of 180° F., using six to eight quarts per unit.

(b) Chemical sterilization — chlorine — 200 parts per million.

(c) Lye, using 0.4 or slightly less than one-half of one percent.

Dissolve one can (13 oz.) of lye into one gallon of water to make the STOCK solution.

Then, use one-half teacupful, or six ounces, of the above STOCK solution to one gallon of water.

The solution contained in teat cups and milking tubes to be discarded after each use.

Chlorine Sterilization

The proper strength of the chlorine solution should be 200 parts per million and should be prepared according to the directions of the manufacturer. This solution contained in the teat cups and milking machine tubes to be discarded after each use.

5. STORAGE: The use of crocks or earthenware jars for storage of teat cups and milking machine tubes shall be discontinued. Certain types of milking machines do not require storage racks. Dry storage is recommended at all times. However, during the spring, summer, and fall months, wet storage (use of solution racks with the proper strength lye or chlorine solution) can be substituted.

Definition: Dry Storage. All parts shall be drained and stored dry in the milk house in a sanitary manner.

6. The milking machine shall be rinsed or flushed out immediately prior to use.

It was agreed that the representatives of the milking machine manufacturers and the industry carry on an educational campaign among producers using milking machines to install hot water heating facilities in the milk house.

7. All rubber parts should be examined regularly to determine if they are porous, cracked, or deteriorated. If parts are found to be in poor condition, they are to be immediately replaced with new rubber parts.

8. REPLACEMENT OF PARTS FOR MILKING MACHINES: Burrs, Brushes, Milking Rods and Rubber Parts. It was agreed by the manufacturers that their local dealers will carry on hand a sufficient supply of the above materials to service all of the machines in use locally.

It was suggested that the manufacturers, at regular intervals, send to the users of their milking machines a card calling their attention to the fact that they can buy replacements of worn rubber parts, brushes, rods, burrs, etc., at their local dealer's place of business.

The manufacturers agreed that if the industry or a public health official found one of their dealers or representatives selling a milking machine to a producer without giving him instructions on the proper care and sanitation of the machine, or if they found this dealer without a sufficient stock of milking machine parts on hand, the manufacturer would, on being notified of this condition, correct it.

It was suggested that the manufacturers use the local newspapers and other producer's papers to disseminate articles on the care and sanitation of milking machines.

It was further suggested that the cooperation of the various State Farm Bureau Associations be obtained in order to have their county agents assist in this educational program.

Legal Aspects

Milk Ordinance Inspection Fees Upheld *

(Kentucky Court of Appeals; *City of Newport et al. v. Hiland Dairy Company et al.;* decided June 16, 1942.) A city milk control ordinance provided, among other things, for the payment of a monthly inspection fee by the owner or operator of a milk plant whose milk and milk products were sold in the city. Such fee was based upon the weight of all milk and milk products received or produced at the milk plant and entitled the owner or operator of such plant to regular inspections, which included systematic and regular inspections of the premises and equipment of all milk producers who supplied milk or milk products to such plant for determination of grade. The fee paid to the city was deemed to be consistent with the actual value of the services rendered by the city.

In considering certain questions involving the above-mentioned provisions the Court of Appeals of Kentucky said that the purpose back of the ordinance was the sale of pure milk in the city and that the ordinance was directed primarily at those who sought to distribute milk. The distributors, according to the court, were the ones benefited mainly by the ordinance because, if they were unwilling to obtain a license and to sell the character of milk called for, they would be denied the privilege of doing business in the city. This disposed of the question of the city's right to impose an inspection fee upon the distributors which would be adequate to inspect their plants, as well as the plants of the producers from whom they purchased milk.

Relative to the basing of the fee upon the volume of milk coming into the distributor's plant rather than upon the volume of milk sold in the city, the conclusion was reached that this was not an unreasonable or arbitrary act on the city's part. It was said that at first blush this might seem unfair but the necessity for inspecting all the milk handled by a distributor was apparent when it was considered that the milk, whether gathered in the distributor's own vehicles or purchased at his doors from producers, was so mixed and commingled that it was impossible to trace the product of any one producer. Should impure milk from only one herd reach a distributor's plant it could contaminate his whole supply. Furthermore, the inspector's duties would be the same regardless of the amount of milk a distributor might sell within the city. For example, said the court, if a distributor gathered milk from 20 farms but sold only 10 percent of it in the city, it would still be the inspector's duty to inspect all of the 20 producing plants, as well as the distributor's plant. "Unless proper facilities were established, there would be no way of segregating milk going to consumers in the city."

The next question considered was whether the levying of the inspection fees was unreasonable and arbitrary as between distributors, the example being cited of a small distributor paying a very small fee while a large distributor would be required to pay a much larger fee even though the major part of his milk might be sold outside the city. The levy, said the court, was upon a class and involved the volume of business done or, at least, the possibilities for business. "Such a plan seems reasonable to us. Because of the unusual character of the commodity under consideration and the possibility of a very small amount of impure milk contaminating a large amount of it, we fail to see how one can seriously contend that the levying of the fee on the basis of the volume of milk coming into the plant is arbitrary." It was pointed out that the large distributor who sold the major portion of his milk outside the city could, if he so desired, arrange his facilities for handling separately that part of his milk sold in the city.

With respect to the remaining question as to whether the fees would produce an amount in excess of that necessary to carry out the purposes of the ordinance, it was stated that this condition, if it should arise, could be readily adjusted, since the ordinance clearly set forth that it was the city's intent to collect only an amount sufficient to effectuate the ordinance.

Prohibition of Digging Hard Clams Upheld * [1]

(New York Supreme Court; *Matter of De Roche;* decided 1942.) In March 1942 the New York State Conservation Commission by an order and the New York City Board of Health by a resolution prohibited the digging of hard clams in Raritan Bay. By statute authority was vested (a) in the

* *Pub. Health Repts.*, Nov. 6, 1942.

* *Pub. Health Repts.*, Oct. 16, 1942.

[1] This is believed to be the first court decision recognizing the coliform scoring of waters as a criterion of shellfish safety.

conservation commission to certify those lands from which shellfish could be taken for use as food and (b) in the board of health to regulate all matters affecting health in the city. The petitioner sought to have the order and resolution rescinded and to have the commission and board (a) directed to reopen the bay for clam digging, (b) restrained from enforcing the order and resolution, and (c) directed to fix and determine on a scientific, fair, accurate, and reasonable basis a standard of purity and sanitary condition for hard clams to be taken or sold and for the waters overlying such hard clams. The power of the commission or the board to act was not challenged by the petitioner but he contended that their action treating a scientific subject had been unscientific and, as a result, was arbitrary, capricious, and unreasonable and, consequently, illegal.

The returns filed by the respondent commission and board showed that the waters were made available for removal of hard clams on January 1, 1940, and continued as an operating area for clammers until the above-mentioned order and resolution were made. When the waters were opened to the clam industry the two respondents made tests and came to certain conclusions based upon standards of safety accepted by the various authorities then vested with control. In making these tests the respondents had collaborated with a bacteriologist affiliated with those business men interested in the clam industry and at that time (autumn, 1939) the unanimous opinion was that "where tested waters showed a score of 70 coliforms per 100 milliliters that degree of pollution indicated an absence of pathogenic organisms or at least that condition could be assumed with safety." Later there was an unaccountable rise in the coliform scores in the bay and the authorities of the States of New York and New Jersey and of the city of New York requested the United States Public Health Service to make a comprehensive investigation of the waters of Raritan Bay with relation to the harvesting for human consumption of hard clams found therein. A report was made by the Public Health Service on the public health aspects of clamming in Raritan Bay and the Supreme Court of New York said that an examination of the report "reveals a carefully prepared document and reflects most deliberate planned action wherein the utmost care was exercised in making the tests and performing experiments to the end that an accurate, fair, convincing result would be obtained. The report shows the bay waters to be dangerously polluted with sewage exposing the public to typhoid fever." This report, together with experiments, tests, and reports made by the respondents themselves, formed the basis for the prohibitory action attacked by the petitioner. The petitioner argued that the report failed to show a single contaminated clam taken from the bay but, in the court's view, that was an unimpressive criticism. The action of the respondents was upheld, the court stating in part as follows: "The presence of polluted waters is sufficient. Authorities should not wait until contamination becomes real. The only point before the court is whether respondents in adopting the resolution and making the order acted arbitrarily, capriciously or unreasonably, which is the charge of petitioner. Respondents have acted. The law authorized their acts. Their competence is not questioned. They have decided after investigation and careful consideration. In their returns they set forth the sources of information which prompted them to act. I find that these sources are unassailable. On the merits this court approves of the prohibitory action, but if it did not, on the showing herein presented, it would be unwarranted in substituting its judgment for that of the administrative authorities charged with the responsibility."

Milkshed Construed *

(Connecticut Supreme Court of Errors; *Bryant & Chapman Co. v. Lowell, Dairy and Food Com'r*, 27 A.2d 637; decided July 16, 1942.) A statute defined the natural milkshed of Connecticut as embracing the State itself and "that area or areas adjacent to the State in which fresh milk for daily use in Connecticut is produced, or may be produced, and which gradually expands or contracts over a contiguous milk producing area in accordance with the operation of the law of supply and demand." By the statute dairy farms located in the natural milkshed and outside the boundaries of the State, and producing fresh milk for daily use in the State, were subject to the same registration, inspection, and approval as dairy farms in the State and producing milk for sale in the State. The State dairy and food commissioner was forbidden to inspect dairy farms for the production of milk which were located beyond the natural milkshed of the State except in the event of (a) a milk shortage in the State milkshed or (b) an emergency. Certain dairies in New York in an area adjacent to the New York-Connecticut State line had registered with the defendant dairy and food commissioner and had been inspected by the defendant at State expense pursuant to the provisions of the above-mentioned statute. These dairies, whose location was such that they could supply fresh milk for daily use in Connecticut, were found upon inspection to comply with the Connecticut standards of sanitation and public health, but the defendant refused to approve them as a source of milk supply for daily use as fresh milk in Connecticut because he found that there was no shortage of milk in the State milkshed, that no emergency existed, and that the "dairies were beyond the natural milkshed."

In a mandamus action against the commissioner the Connecticut Supreme Court of Errors was of the view that the part of the statutory definition of the natural milkshed of the State which referred to an area adjacent to the State "in which fresh milk for daily use in Connecticut is produced, or may be produced" presented a comparatively simple question of fact. "Can the milk be preserved and transported to Connecticut in time to be usable as fresh milk?" With respect to the additional qualification that such area "gradually expands or contracts over a contiguous milk producing area in accordance with the operation of the law of supply and demand," the court said that the qualification was merely descriptive, that it added nothing to and subtracted nothing from the definition, and that it could be disregarded. "The apparent purpose of the clause under consideration was to make it clear that the area of the natural milkshed was not one which was fixed as of any particular time but was one which would fluctuate from time to time in accordance with the law of supply and demand." According to the court the facts stipulated brought the dairies involved in the instant case squarely within the statutory definition of the natural milkshed as interpreted above.

The court also rejected the defendant's claim that it was the legislature's intention to delegate to him the authority to define the boundary of the natural milkshed in accordance with the operation of the law of supply and demand and that before he could find out-of-State dairies within the natural milkshed he first had to find that a shortage or emergency existed in Connecticut. That intention, said the court, was not expressed and could not be implied from the vague qualification of the definition of the natural milkshed. It was pointed out that the defendant commissioner, under his own construction of the statutory definition, had found that the dairies in the instant case were in the natural milkshed because he, although finding that there was no shortage and no emergency, had inspected the dairies at State expense. The court said that it could not be assumed that he would act in direct contravention of the expressed direction of the statute that he "shall not inspect dairy farms for the production of milk which are located beyond the natural milkshed of this State except in the event of a milk shortage in such State milkshed, or in the event of an emergency."

Milk Pasteurized from Outside of City *

Milk—prohibition of sale in city when pasteurized outside of county in which city is located.—(Texas Court of Civil Appeals; *Prescott* v. *City of Borger et al.*, 158 S.W.2d 578; decided January 12, 1942, rehearing denied February 9, 1942.) In 1940 the commission of the city of Borger enacted an ordinance which in substance provided that no milk or cream should be sold in the city that had been pasteurized outside of Hutchinson County, in which the city was located, except as might be authorized by the city health officer. When the ordinance was passed the plaintiff was engaged in the business of selling and distributing grade A pasteurized milk in Borger. He neither produced nor pasteurized the milk he sold but procured it at wholesale prices from a creamery located in Potter County and sold it to his customers in Borger in the bottles in which it had been placed by the creamery. The plaintiff brought suit against the city and its mayor and other officials for an injunction against the enforcement of the ordinance, alleging that the ordinance was invalid and unenforceable.

The Court of Civil Appeals of Texas, after reviewing a 1937 enactment of the State legislature regulating the pasteurization, handling, and sale of milk and its products, said that from such review it would be seen that the legislature had entered the field of legislation covered by the city ordinance and that it was well-established law in Texas that, generally, the governing authorities of cities were prohibited by the constitution and the statutes from entering a field of legislation that was occupied by general legislative enactments. Therefore, a city could not legally enact an ordinance which conflicted or was inconsistent with either the constitution or statutes, but the limitation placed upon local bodies did not extend, of course, to those ordinances which were permitted by or were in harmony with constitutional and statutory provisions. According to the court, the defendants had authority, under specified provisions of the milk statute abovementioned, to enact an ordinance regulating the pasteurization of milk and the handling and sale of pasteurized milk in the city but they could not go beyond the limits of the authority given them in the statute. "We do not think the requirements of the ordinance come within the limitation of such enactments as, under the statute, the city's governing body had authority to adopt. The power to provide facilities by which the grades of milk may be determined does not include the power to dictate the location of the plants in which the milk is pasteurized." The court held that the ordinance was un-

* *Pub. Health Repts.*, Oct. 23, 1942.

* *Pub. Health Repts.*, July 24, 1942, p. 1113.

constitutional and void since it transcended the general statutes of the State and went beyond those specific powers extended to city authorities by the milk statute above referred to.

The injunction prayed for by the plaintiff was granted.

Pasteurized Milk from Outside of City*

Pasteurized milk—prohibition of sale in city unless pasteurized therein.—(California District Court of Appeal, Fourth District; *Van Gammeren et al.* v. *City of Fresno et al.*, 124 P.2d 621; decided April 13, 1942.) Included in an ordinance of the city of Fresno regulating the sale of milk was a provision making it unlawful to sell or deliver in the city any pasteurized milk or cream for drinking purposes unless it had been pasteurized within the city and under the inspection required by the ordinance. The plaintiffs were processors and deliverers of milk for human consumption and each operated a pasteurizing plant outside of Fresno, the farthest plant being 4 miles distant from the city limits. The plaintiffs' dairies were regularly inspected by the milk inspection service of the city of Fresno acting as the inspection service of Fresno county. An action was brought by plaintiffs to enjoin the city and certain of its officials from preventing plaintiffs from delivering their milk in Fresno for the sole reason that their pasteurization plants were outside the limits of Fresno.

The question presented to the California District Court of Appeal was the validity of the above-mentioned portion of the city milk ordinance, and the court's holding was that such portion of the ordinance was void. In its opinion the court quoted from a prior decision of the California Supreme Court in which the conclusion had been reached that a portion of another city ordinance, in every respect similar to the portion of the Fresno ordinance in question in the instant case, was discriminatory, unreasonable, and void. In the case quoted from, the supreme court had said that it had been held quite generally that the city limits as the boundary line outside of which plants could not be located if the milk was to be sold within the city did not have a reasonable relationship to a proper legislative object and that, therefore, ordinances fixing such a boundary were invalid.

* *Pub. Health Repts.*, Aug. 7, 1942, p. 1192.

State Legislative Power Not Delegated*

New York City Sanitary Code—State legislative power not delegated.—(New York Court of Appeals; *People, on Complaint of Yonofsky* v. *Blanchard*, 42 N.E.2d 7; decided April 30, 1942.) The sanitary code of the city of New York was formulated by the city board of health pursuant to authority conferred by the city charter. It was provided in the charter that any violation of the sanitary code should be treated and punished as a misdemeanor, and the penal law contained a like provision that a person who wilfully violated or refused or omitted to comply with any lawful order or regulation prescribed by any local board of health or local health officer was guilty of a misdemeanor. The defendant, who had been convicted of violating the said sanitary code, contended that these enactments delegated to a local health board the legislative power to define criminal offenses and to prescribe penal discipline therefor, thereby violating the State constitutional provision that the legislative power of the State should be vested in the legislature.

The Court of Appeals of New York said that, within limits that were to be measured by tradition, the State could commit to local governments the power to regulate local affairs and that on that basis the main business of safeguarding the public health had always of necessity been done by local boards or officers through sanitary by-laws or ordinances which had been accorded the force of law. "Consequently the sanitary code is to be taken to be a body of administrative provisions sanctioned by a time-honored exception to the principle that there is to be no transfer of the authority of the legislature." It was true, according to the court, that the substantive law making power of the people was vested by the constitution in the legislature and could not be delegated and that the definition of criminal offenses and the prescription of punishment therefor were part of that legislative power. "So, the legislature has declared that no act or omission is a crime except as prescribed by statute." But the court took the view that there had been no infringement of these standards in the instant case. The city board of health had not been licensed to define any criminal offense. It was the city charter and the penal law that made any violation of the sanitary code a misdemeanor. "On that score, the sanitary code merely says that any violation thereof shall be punished in the manner prescribed by the charter and by the penal law."

* *Ibid.*, Aug. 7, 1942, p. 1193.

New Books and Other Publications

State Milk and Dairy Legislation, prepared by The Marketing Laws Survey, U. S. Department of Commerce, 595 pp. Vol. III in Marketing Laws Survey Series, published by Government Printing Office, Washington, D. C., $1.50.

This is the third in a series of volumes published by the Marketing Laws Survey which for three years has been compiling and analyzing state marketing laws and depicting their impact upon various phases of business and economic activity which have been subjected to some degree of state regulation or control. The Survey which began its work under the Work Projects Administration has since November, 1941, been operated by the Bureau of Foreign and Domestic Commerce, Department of Commerce.

The State Milk and Dairy Legislation volume is divided into three parts, each directed to a separate kind of regulation to which the milk industry and its members have been subjected. Primary consideration is given to the relatively recent surge of state legislation affecting control over the price at which milk may be sold at various steps in its distribution to the ultimate consumer. This kind of legislation, unknown to the milk industry 10 years ago, had its beginning generally as a temporary measure during the depression of the early 30's and has now spread to 21 states. The wide diversity in the scope of the Acts, in the methods and procedures of price establishment and determinations of price levels, and in the provisions relating to administration and enforcement, as set forth in this section, lend validity to the conclusion that, "Milk control legislation to become more successful in operation will need the support of closer cooperation between the several States and also between the States and the Federal Government" (p. 88).

In Part II is presented a comparative analysis of state legislation relative to the licensing of persons engaged in various phases of the milk and dairy industry and to the administration of such licensing requirements. Part III deals with regulations and restrictions on the entry into the market of milk and milk products as commodities, as distinguished from the entry of persons.

Emphasis has been placed, in all parts of the study, on regulation by the States rather than by local authority; the latter has been treated only incidentally in relation to State-enabling legislation. The textual discussion and analysis throughout the volume is amply supported by comparative charts and tabular presentations of the diverse statutory provisions and requirements by which the various States seek to accomplish their generally common goals whether the particular goal be the control of the conditions under which milk may be produced or processed and the standards of quality it must meet, or the regulation of the price at which it may be sold, or the imposition of conditions precedent on persons for the privilege of dealing in milk or milk products. The procedural and substantive limitations upon the powers of the States as to permissive areas and extents of control permitted by the Constitution are traced by reference to judicial decisions throughout the book.

While the subject of the volume is laws and legislation, statutes and cases, the writing is in the style and spirit of the layman, and its object is accomplished in its graphic portrayal of the impact of these multiple laws on the industry regulated. The materials have

been organized and presented in a manner to make the compilations useful as a ready source of reference in a field of current interest and significance to the business executive, the research worker, and the student, as well as to Federal and State regulatory agencies.

WILLIAM H. EDMONDS

Microbiology of Meats, by L. B. Jensen. Published by the Garrard Press, Champaign, Illinois. 1942. 252 pages. $4.00.

The microbiology of meat foods, as presented in this book, emphasizes its practical application to industrial meat operations. No pretense to completeness on any subject is made, although the author succeeds very well in presenting a comprehensive discussion of the literature, personal and industrial research findings, and useful summaries of existing knowledge in the subjects that he takes up. These are particularly the effects of sodium nitrate on meat, gaseous fermentation by the genus *Bacillus,* green discoloration, microorganic action on fats, ham souring, microbiology of beef, bacteriology of sausage, control of microorganisms, and bacteriology of spices, salt, sugar, paper, and wood. He gives a good summary of food poisoning of bacterial origin, including the procedure to be followed in handling and examining samples suspected of being implicated in food poisoning. He speaks out strongly against non-specific animal inoculation, and concludes by summarizing briefly the position in food-poisoning outbreaks of Staphylococci, Salmonella, *Cl. botulinum,* and Streptococci, and the alleged role of several other types whose etiological relationship to food poisoning has not been clearly shown. His personal studies on the bacterial content of animal tissues and their infection in slaughter procedure is illuminating in a controversial field. Also his outline of cleanup directions for meat packing houses is useful.

Forensic Chemistry, by Henry T. F. Rhodes. Published by Chemical Publishing Co., Inc., Brooklyn, N. Y. 1940. 214 pages. $5.00.

Forensic chemistry is a subject that is usually left to specialists in the field, such as criminologists, and others connected with the detection of crime. The information is widely scattered and much is available only in forms accessible and interpretable to specialists. However, occasion often arises in the professional duties of the chemist when knowledge of the ways and means of finding his way around in the field of "detective" chemistry comes in handy, to say the least. The author has collected many useful methods, and presented them briefly from both the theoretical and the practical standpoints. Much of the material reflects the experience of the author.

The chapter headings are: The direct identification of the person, The indirect identification of the person, Stains, Firearms and Explosives, The Chemical Examination of Questioned Documents, The Chemical Examination of Counterfeit Money, The Examination of Toxic Agents, and References (146). Although it does not deal with the prosecution of food cases, it should be available and read by chemists in the employ of municipal and state governments as well as those engaged in any regulatory work, whether official or industrial.

Food Manufacturing, by Saul Blumenthal. Published by the Chemical Publishing Co., Inc., Brooklyn, N. Y. 1942. 664 pages. $7.50.

The subtitle of this book is "A Compendium of Food Information with Factory-tested Commercial Formulae for the Food Manufacturer, Chemist, Technologist, in the Canning, Flavoring, Beverage, Confectionery, Essence, Condiment, Dairy Products, Meat and Fish, and Allied Industries."

The book contains a vast amount of information useful to food manufacturers who seek formulae, recipes, trade names and practices, and names and properties of wide varieties of foods and products used in the manufacture or preparation of foods. These products are discussed from the standpoints of their sources, organoleptic properties, and methods of handling.

Among the useful tables in the Appendix is one that converts from one system of weights and volumes to another by giving the respective factors to multiply by.

Very little space is given to food technology as such—only enough to acquaint the reader in an elementary way with the practices in the respective industries. The emphasis is placed on the ingredients and the products. This is a very useful service. It does for the food industry what several books do for the chemical industry. A food technologist will often find this book useful, and will take it down when he wants to get some technical information quickly about a formula or ingredient.

JOURNAL OF MILK TECHNOLOGY

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THIRTY-FIRST ANNUAL BUSINESS MEETING INTERNATIONAL ASSOCIATION OF MILK SANITARIANS

The thirty-first annual business session of the International Association of Milk Sanitarians was held on October 31, 1942, at the Hotel Jefferson, St. Louis, Missouri.

Order of Business

Reading of the minutes of the thirtieth annual meeting. Approved.

Treasurer's report. Approved.

Secretary's report. Approved. (A complete text of this report appears in Journal of Milk Technology, Vol. 5, p. 378.)

Auditor's report. Approved.

Resolutions Committee report. Approved:

One of the resolutions adopted is herewith given in full:

"Whereas, existing Federal law pertaining to the sanitary inspection of process or renovated butter factories and to the kind and character of the ingredients from which process or renovated butter may be made does not provide for adequate control of plant sanitation nor of the ingredients entering into the manufacture of the finished product to an extent sufficient to assure a clean product to the consumer; therefore

Be it resolved, that the International Association of Milk Sanitarians heartily endorses the efforts to strengthen this control and go on record as in favor of the enactment of Senate Bill S. 2079 and House Bill H.R. 6098, which provide for a more effective control of the manufacture and sale of process or renovated butter; and

Be it further resolved, that the Secretary send a copy of this resolution to the Senate and Congressional Committees and various governmental agencies concerned."

New Business

By resolution from the floor, the Executive Board was requested to study the matter of the establishment by the Association of a scholarship or fellowship in some educational institution designed particularly to train personnel in the field of milk sanitation.

The following motion was made and carried:

"That the President appoint a committee of from five to seven members of the Association, to study milk ordinances and regulations which it considers fairly representative of those in effect throughout the United States, and to formulate a set of standards and requirements covering production and handling of raw milk for sale and use in its raw state; raw milk for pasteurization and the process of pasteurization, including in such standards and requirements only those which the committee considers essential and necessary to ensure a safe product of acceptable quality."

There was considerable discussion before the adoption of the motion relative to the membership of the committee and to the method to be used in accepting or rejecting the proposed report. The original wording of the motion was left unchanged, as it relates to appointment of members. By motion, the report will be submitted to the entire membership, and subsequent action will depend upon a vote of the members.

During the past year the Executive Board studied the 1941 report of the Committee on Affiliations. This report, with modifications believed desirable by the Executive Board, was presented in the form of a motion. This was adopted. The complete text of this motion follows this summary. In brief, this action by the Association will permit the affiliation of a local association with the International. The local associations will not lose. in any way, their present identity but will be able to receive certain privileges which otherwise would not be available. By the same action it will be possible for members of the Association to form regional chapters of the International, similar to those which, for some time, have been recognized and authorized by the American Public Health Association and the American Society of Bacteriologists.

As a result of the above action, there will be established an Advisory Committee, appointed by the President. The purpose of this Committee will be to advise the Executive Board on matters of policy, programs, and relationships between the affiliated organizations and the International. Its membership will consist of a representative of each affiliated organization.

The Executive Board was instructed to bring to the attention of the military forces the fact that there is no place in the organizations for trained milk sanitarians, and that their services might well be utilized in the control of Army and Navy milk supplies. The New York State Association of Milk Sanitarians is to take similar action. Committees of the International and New York State Associations will confer relative to joint action.

The Executive Board was instructed to study the present relative status of milk sanitarians, veterinarians, and sanitary engineers employed in various health departments and other similar organizations.

The following officers were elected:

President—C. A. Abele, Chicago, Ill.

First Vice-President—R. R. Palmer, Detroit, Mich.

Second Vice-President—R. G. Ross, Tulsa, Okla.

Third Vice-President—W. D. Tiedeman, Albany, N. Y.

Secretary-Treasurer — C. S. Leete, Albany, N. Y.

Auditors—J. W. Yates, Philadelphia, Pa.; F. D. Holford, New York, N. Y.; M. A. Heinzman, Ventura, Calif.

AFFILIATIONS AND REGIONAL CHAPTERS

With the continued growth and expansion of the INTERNATIONAL ASSOCIATION OF MILK SANITARIANS there has developed a need and desire for a means whereby local organizations of milk sanitarians could associate themselves more closely with the International and whereby a group of present members could form a regional chapter. For the past several years a committee of the International has studied this matter, and at the 1942 annual meeting in St. Louis the Association adopted a definite plan, based primarily upon the committee's report, which makes possible the organization of both affiliate organizations and regional chapters. The plan in detail is as follows:

Affiliation Plan

I. Any association of milk inspectors, sanitarians, or technologists desiring affiliation with the INTERNATIONAL ASSOCIATION OF MILK SANITARIANS, or any local area group of members of this Association desiring to form a regional chapter, shall make application in writing to the Secretary of the INTERNATIONAL ASSOCIATION OF MILK SANITARIANS, as follows:

A. *To secure affiliation of existing organizations*

1. The secretary or duly authorized officer of the applicant organization will make written request for affiiliation status, stating the name under which the applicant organization desires to be known;

2. Supply names and addresses of officers;

3. State names, addresses, and employment of all members divided into

inspectional (official), educational, and industrial groups;

4. Furnish copy of constitution and by-laws and a copy of the minutes authorizing the filing of the application.

5. State area covered by existing organization, and also the area which it intends to embrace;

6. State estimated percentage of total membership which will affiliate as Associate members in the INTERNATIONAL ASSOCIATION OF MILK SANITARIANS. (See paragraph 3.)

7. Agree to designate the *Journal of Milk Technology* as its official organ.

B. *To organize a regional chapter of present members of International Association of Milk Sanitarians*

1. A group of at least five active members of the INTERNATIONAL ASSOCIATION OF MILK SANITARIANS shall sign the application for organization of a regional chapter.

2. Supply names of those members of the INTERNATIONAL ASSOCIATION OF MILK SANITARIANS suggested by the applicants for allocation of their group.

3. State area desired to be embraced by the chapter.

II. When the application of an existing association for affiliation or of a group for regional chapter organization has been received by the Secretary of the INTERNATIONAL ASSOCIATION OF MILK SANITARIANS, he will inform the members of the Executive Board concerning the above application, together with any additional information he considers useful. A majority vote of this Board either in meeting assembled or by correspondence, will determine whether the application be granted.

III. Upon completion of this vote, the Secretary of the INTERNATIONAL ASSOCIATION OF MILK SANITARIANS shall notify the applicant secretary or the applicant members, as the case may be, under Paragraph A or Paragraph B above, respectively, of the action of the Executive Board. In case of acceptance of the applicant association, its secretary shall then mail to the secretary of the INTERNATIONAL ASSOCIATION OF MILK SANITARIANS remittances to cover the amount of their membership dues, in accordance with the status they desire to establish or maintain in the I.A.M.S., namely $2.00 per associate member and $3.00 per active member.

IV. The Executive Board is authorized to refund to any local affiliate or regional chapter of the INTERNATIONAL ASSOCIATION OF MILK SANITARIANS 50¢ per member for use of the promotion of their activities upon the receipt of the aggregate membership dues and a report covering items requested.

V. Any affiliated organization may use the expression "affiliated with the INTERNATIONAL ASSOCIATION OF MILK SANITARIANS," or an equivalent legend, approved by the Executive Board of the INTERNATIONAL ASSOCIATION OF MILK SANITARIANS.

VI. The Executive Board of the INTERNATIONAL ASSOCIATION OF MILK SANITARIANS may revoke an affiliation or dissolve a regional chapter for just cause after affording such organization to make such presentation as it wishes to the Executive Board. In no instance shall such action be taken without three months' written notice, thereof.

One of the major advantages to be gained by the organization of either an affiliate or regional chapter is that of bringing local activities and local problems into a closer association with the International, and in turn enabling the International to become better acquainted with the problems of milk sanitation from the viewpoint of the local sanitarian.

Local meetings will, in a sense, supplement the annual Association meeting. It is hoped that eventually a delegated representative of the International will be able to attend local meetings, if so desired.

In order to assist both the local organizations and the International in achieving a better understanding of their individual and mutual problems, it is contemplated that an advisory committee will be established. Such committee would consist of one representative from each affiliate or regional chapter. The duties of this committee would be to advise the Executive Board of the International on matters of policy, programs, meetings and related activities.

The provisions of Sections III and IV of the plan regulate the financial responsibilities of an affiliate or regional chapter. By taking advantage of these provisions yearly, membership may be obtained for $1.50 for associate, and $2.50 for active members, which includes in both instances, subscription to the *Journal of Milk Technology*. It is desirable that all members of a local organization become members of the International, although this is not a prerequisite.

Those organizations which are interested in affiliation with the International, or those members of the International who desire to form a regional chapter, should write to the *Secretary-Treasurer*, C. S. Leete, State Department of Health, Albany, N. Y.

New Members

INTERNATIONAL ASSOCIATION OF MILK SANITARIANS

ACTIVE MEMBERS

Becker, Louis R., D.V.M., Dairy Farm Inspector, St. Louis Milk Control Board, 209 Broad St., Jacksonville, Fla.

Black, Luther A., Bacteriologist, U.S.P.H.S., Sanitation Section, Washington, D. C.

Courtney, Private James L., Private in Medical Detachment, Air Corps, Army of the U. S., c/o Mr. J. F. Courtney, Russellville, Tenn.

Frank, George A., Supervisor, St. Louis Health Dept., 5456 Enright Ave., St. Louis, Mo.

Goslee, H. Clifford, Supervising Inspector of Dairies, State Dairy and Food Commission, 256 Palm St., Hartford, Conn.

Henderson, J. F., Dairy Inspector, Bureau of Food and Dairy Inspection, Jefferson County Board of Health, Box 2591, Birmingham, Ala.

Huffer, Enos G., Asst. Milk Sanitarian, Department of Public Health, Springfield, Ill.

Kowelk, Henry, Director, Div. of Milk and Lab., Dept. of Public Health, Flint, Mich.

Miller, John H., Asst. State Sanitary Engr., State Health Department, Charleston, W. Va.

Larsen, Tom, Chief, Milk Sanitation, State Board of Health, Topeka, Kansas.

Lopez, Aurelio Antonio, Chief of Laboratory, Amador Guerrero Hospital, P. O. Box 552, Colon, Republic of Panama.

Olson, H. C., Professor of Dairy Mfg., Oklahoma A. & M. College, Stillwater, Okla.

Peterson, Oliver H., First Lieut., Sn.C., Station Hospital, Fort Riley, Kansas.

Pilgrim, Dr. S. L., Chief, Bureau of Food and Sanitation, Health Department, Milwaukee, Wis.

Riley, P. Edward, Asst. Milk Sanitarian, Illinois Dept. of Health, 1800 W. Fillmore St., Chicago, Ill.

Rowland, J. L., Chief Sanitarian, Health Dept., Oak Park, Ill.

Rowles, L. W., Chief, Milk Section, City Bldg., Topeka, Kan.

Shook, Lowell C., Public Health Sanitarian, Indiana State Board of Health, 5140 Ralston Ave., Indianapolis, Ind.

Starkey, Charles T., Principal Sanitarian, Washington County Health Department, 907 Buffalo St., Johnson City, Tenn.

ASSOCIATE MEMBERS

Ackerman, Lyle M., Dairy Sanitation, Dairymen's League, R.D. 2, Homer, N. Y.
Ahrens, Alfred H., Dairy Chemist, Dairymen's League, 542 East 19th St., New York City.
Anderson, R. L., Sheffield Farms, Inc., Canton, N. Y.
Baker, Glen, Manager, Fairmont Creamery Co., Quaker Bridge, N. Y.
Banner, E. B., Salesman, Kendall Mills, Hillside Road, E. Gloucester, Mass.
Bernstein, Dr. Leo, Board of Health Lihue, Kauai, Hawaii.
Brown, Kenneth G., Milk Inspector, Borden's, Pine Plains, N. Y.
Brown, Levi H., Dist. Superintendent, Sheffield Farms, Vergennes, Vt.
Carasso, Daniel, President, Dannon Milk Products, Inc., 17 E. 96th St., New York, N. Y.
Carlson, Roy E., Manager, Wichita Natural Milk Products Cooperative Association, 311 North Washington St., Wichita, Kansas.
Combs, R. P., Treasurer, Long-Bell Lumber Co., 813 R. A. Long Bldg., Kansas City, Mo.
Converse, Fred C., Field Man, Hinman Farms Products, Inc., Deansboro, N. Y.
Cook, Stanley G., Sanitary Inspector, Cattaraugus County Dept. of Health, Box 286, Otto, N. Y.
Cotton, R. E., Superintendent, Pennsylvania Blue Ridge Creamery Corp., Galeton, Pa.
Creath, Mead P., Junior Milk Sanitarian, N. Y. State Dept. of Health, Gouverneur, N. Y.
Davisson, D. B., Partner, Seminole Dairy Products Co., Box 1332, Seminole, Okla.
Dey, Marcus, Golden State Company, Ltd., 1120 Towne Ave., Los Angeles, Cal.
Donoh, John J., Milk Inspector, Borden's, Millerton, N. Y.
Dye, Harold, Buffalo Milk Producers Coop., 1275 Jefferson Ave., Buffalo, N. Y.
Evans, W. Mouton, Salesman, Hinman Milking Machine Co., 83 Genesee St., New Hartford, N. Y.
Finley, Roy D., Jr., Bacteriologist, Pet Milk Co., New Glarus, Wis.
France, Raymond, Inspector, Sheffield Farms Co., 159 Prospect Ave., Walton, N. Y.
Frank, Wm. S., Plant Superintendent, Sheffield Farms, 50 West St., Walton, N. Y.
Fritz, J. A., Superintendent, Sheffield Farms, Chateaugay, N. Y.
Fuller, L. L., Salesman, DeLaval Separator Co., 25 Nathaniel Blvd., Delmar, N. Y.
Garthe, Edmund C., Passed Assistant Sanitary Engineer, U.S.P.H. Service, Sub-Treasury Bldg., Pine, Nassau and Wall Sts., New York City.
Gearhart, W. J., Milk Inspector, City Hall, Atchison, Kansas.
Geiss, Michael J., Manager, Brookfield Dairy, 718 Otisco St., Syracuse, N. Y.
Gerhard, E. P., Superintendent, DeLaval Separator Co., House Springs, Mo.
Gilyard, Richard T., Capt., 808 Commonwealth Ave., Boston, Mass.
Grossman, Harvey, Health Dept. (N. Y. C.), 2215 E. 19th St., Brooklyn, N. Y.
Hargrave, E. R., District Superintendent, Sheffield Farms Co., 114 Erwin St., Bronxville, N. Y.
Hawkins, James Vernon, Jr., Sanitarian, Texas State Dept. of Health, Box 271, Odessa, Texas.
Hoard, W. D., Jr., President, Hoard's Dairyman, Fort Atkinson, Wis.
Holmes, Wesley S., Assist. Secretary, Philadelphia Interstate Dairy Council, 158 North 20th St., Philadelphia, Pa.
Ireland, Winsor D., Sanitary Inspector, Monroe County Sanitation Dept., 48 Laurelton Road, Rochester, N. Y.
Jackson, Richard, Jr., Food and Drugs Inspector, 719 De Graw Ave., Newark, N. J.
Kalisch, A. H., Supervising Repr., DeLaval Separator Co., 940 W. Lafayette St., P. O. Box 364, Jacksonville, Ill.
Karsten, Alfred D., Secretary-Treasurer, Karsten Dairies, Inc., 2338 Hermany Ave., Bronx, New York City.
Kaing, T. H., Sales and Service, American Seal-Kap Corp., West Nyack, N. Y.
Laufer, Stephen, Dr., Director of Laboratories, Schwarz Laboratories, Inc., 202 E. 44th St., New York, N. Y.
Lombard, Dr. F. A., 414 Grand St., Troy, N. Y.
Lounsberry, Dr. L. M., Assistant Veterinarian, New Jersey State Dept. of Health, 38 Wilber St., Belleville, N. J.
Lucas, George L., Division Superintendent, Sheffield Farms, Pawling, N. Y.
Madan, Nathan J., Health Inspector, N. Y. C. Health Dept., 1854 Ocean Ave., Brooklyn, N. Y.
Manning, John J., Food and Drug Inspector, Newark Dept. of Health, 44 Salem St., Newark, N. J.
Maxwell, L. C., Dairy Sanitarian, Dairymen's League, Akron, N. Y.
Melhuish, Vern P., Assistant General Field Representative, Carnation Co., Oconomowoc, Wis.
Millenky, Abraham, Junior Milk Sanitarian, State Health Dept., 199 Lexington Ave., Buffalo, N. Y.
Miller, Alan B., Assistant Production Manager, Abbotts Dairies, Inc., Locust St. Oxford, Pa.
Miller, Carl, Buffalo Milk Producers Coop., Arcade, N. Y.

Morrow, Francis W., County Production, Sheffield Farms, 524 W. 57th St., New York City.
Morse, S. B., Director of Research Laboratory, The Borden Co., 600 N. Franklin St., Syracuse, N. Y.
Moulton, Bruce H., Inspector, Sheffield Farms, 11 Lake St., Chateaugay, N. Y.
Muldoon, Dr. N. J., Milk Inspector, Health Department, Oswego, N. Y.
Myers, V. C., Sheffield Farms, Cruxton, N. Y.
Nellis, Walter J., Plant Manager, Syracuse Guernsey Dairy Co., 1606 E. Erie Blvd., Syracuse, N. Y.
Newman, Dr. Alphonso C., Veterinarian, Sussex Milk and Cream Co., 5 Thomas St., Middlebury, Vt.
Oggel, Henry F., Dairy and Food Inspector, City Health Dept., City Hall, Kalamazoo, Mich.
Perry, H. Lynn, Field Man, Arkport Dairies, Inc., Arkport, N. Y.
Pierce, Henry R., Milk Inspector, E. Smithfield Farms, Burlington, Pa.
Roehr, Roy E., Laboratory Technician, Pet Milk Co., 401 North L. St., Sparta, Wis.
Schuman, Bernard K., Inspector, Sheffield Farms, Phelps, N. Y.
Slater, Stewart, Milk Inspector, N. Y. C. Health Department, Mansfield, Pa.
Slentz, Walter, Barn Inspector, Sheffield Farms, Norwich, N. Y.
Smalley, A. K., Manager of Sales, The Carpenter Steel Co., P. O. Box 116, Roselle, N. J.
Smith, Dr. R. E., Margaretville, N. Y.
Snow, R. Milton, Jr., Plant Foreman, Producers Dairy System, 54 Abbott St., Nashua, N. H.
Steckie, Carl, Manager, Sullivan County Dairy Assn., Jeffersonville, N. Y.
Stedman, M. A., Fieldman, Grandview Dairy Co., Walton, N. Y.
Sullivan, F. Robert, Sales Supervisor, Schwartz Mfg. Co., 1842 Kleber St., N.S., Pittsburgh, Pa.
Tatz, Charles, Food and Drug Inspector, Department of Health, 86 Stecher St., Newark, N. J.
Taylor, A. Lloyd, Director of Research, Oakite Products, Inc., 22 Thomas St., New York City.
Tovan, John, Proprietor, Eastwood Dairy, 146 S. Collingwood Ave., Syracuse, N. Y.
Tzall, Bernard, Health Inspector, N. Y. C. Dept. of Health, 165 W. 197th St., Bronx, N. Y.
Ulrich, R. S., Supr. Rep., DeLaval Separator Co., 1208 N. W. 40th St., Oklahoma City, Okla.
Vedder, Dr. C. W., Jr., County Veterinarian, Columbia County Health Dept., 612 Warren St., Hudson, N. Y.
Vogt, Fred L., Veterinary Detachment, Box 96, Fort Warren, Wyoming.
Wainess, Harold, Dairy Bacteriologist, York Ice Machinery Corp., Yorkco Club, York, Pa.
White, Edward A., Veterinarian, Sussex Milk and Cream Co., Sussex, N. J.
White, Leon B., Dairy and Milk Inspector, Borden's, R.F.D. 2, Warwick, N. Y.
Wilson, E. L., Sussex Milk and Cream, Inc., 110 Hudson St., New York City.
Wolford, M. B., Salesman, Whirlflo Corp., Box 231, Downington, Pa.

M. E. PARKER HEADS CHICAGO FOOD TECHNOLOGISTS

M. E. Parker, long a member of the INTERNATIONAL ASSOCIATION OF MILK SANITARIANS, and one of its committee on Sanitary Procedure, has recently been elected Chairman of the Chicago Section of the Institute of Food Technologists.

He also is attending a four weeks orientation course at the Command and General Staff School, Fort Leavenworth, Kansas, beginning early in 1943 "for civilians especially selected from among civic, business, and professional leaders of the country" at the invitation of Lieutenant General Brehon Sommervell, commanding Services of Supply, War Department.

Copies of Correspondence Regarding Commissions for Milk Sanitarians

AN OPEN LETTER TO THE EDITOR

November 12, 1942

Dear Sir:

Since time immemorial it has been man's lot to earn his "daily bread by the sweat of his brow." In this struggle for survival, the complexities of modern society require each and everyone of us to choose that way of life which renders service to our fellow men and offers an inspiration to man to progress to some ultimate goal of attainment. The tools with which one progresses toward that goal are education and experience together with an *opportunity to progress* in the particular field of endeavor which the individual has assumed for his life work. The frustration or partial fulfillment of anyone of these tools lead to despair and disappointment in one's chosen career. Not only in my own behalf, but in behalf of all dairy college graduates who are looking forward to a successful career in public health work, I am humbly addressing this letter to you.

Since public health work in general is a highly specialized field of endeavor, consisting of a number of technical categories such as medicine, chemistry, engineering, dairy science, etc., I decided to make a conscientious attempt to acquire the tools that would equip me to pursue a career in one of these specialized fields—dairy science, as it relates to public health. The first tool was my education which was painstakingly acquired by five years of study in dairy science (B.S. Mass. State College, M.S. Iowa State) under the guidance of men well equipped by education and experience to set one forth in his life's work. Little did these eminent educators suspect that their charges were being deceived and that to be a dairy specialist for a public health career one should study not the intricacies of dairying, but the art of the slide rule, calculus and surveying, or the anatomy of the pig and horse. Oh time, how thou dost change things! After my five years of education in dairying the second tool—experience—was placed in my hands by the opportunity to work in an outstanding health department, the Bureau of Food and Dairy Inspection, of which is under the guidance of a dairy college graduate whose record and experience speak for themselves, a record of achievements which has brought the milk supply of our fair city from disrepute to one which takes its place with the best in the land. And, mind you, this has been done not through a knowledge of surveying and the slide rule, but a down-to-earth knowledge of dairying and all that it implies. Here, sir, is one Bureau of Food and Dairy Inspection which, despite the fact that it also has sanitary engineers (is the Bureau of Sanitation) and veterinarians at its call, has not relegated the dairy graduate to a position of secondary importance but one ranking on an equal footing with its veterinarians and sanitary engineers. For the past seven years under the guiding hand of our capable director of food and dairying, the opportunity to achieve extensive experience in both dairy farm and milk plant inspection has been mine, and greatly have I gained from my experience.

Yet, sir, when I look forward to the future of my career for which I have partially obtained two of the tools to success—education and experience—I find a third tool—opportunity to progress—denied me. This fact has been brought to light very glaringly in the past year when I became aware that perhaps I had the wrong kind of tools to build my career. Amazed and a bit disturbed, I find that as a dairy specialist with an education in dairying, I am a misfit—I should have studied civil engineering or veterinary medicine. What an anomaly! To say "Attorneys at Law beware! Your careers are to be taken over by agronomists," is almost as far fetched. Yet the truth of the matter is evident from the facts. Everywhere we see the dairy graduate relegated to second place—more or less as lay inspectors, while those positions of influence and prestige in the field of dairy science as it applies to public health are falling into the hands of sanitary engineers (a division of civil engineering) and veterinarians.

Sir, it is lamentable that a dairy graduate is losing out in the all important public health field. Not only are we losing out in the United States Public Health Service where, to the best of my knowledge, it is practically impossible for a dairy graduate to hold a commission—a fact that can be attested by several of my colleagues who were refused, about six years ago, employment with the service, when several *sanitary engineers* were hired instead, but also with our armed forces. Five of our *dairy* specialists have entered our Country's armed services as officers—yet not a single one of these men are qualified as dairy specialists. Only the veterinarian is qualified to do this work regardless of the fact that said veterinary may not know a churn from a pasteurizing vat. Consequently, these six men have been relegated to the infantry, sanitary corps, and deck officers in the Navy. Any attempt to even discuss milk by anyone but a veterinarian in the Army is sacrilegious. This rather unique situation in our armed forces is one that should be courageously brought to light and rectified.

And so, sir, you can readily deduct from the above the cause of my pessimism regarding my career and the career of all dairy graduates in public health work. I have addressed this letter to you as one who has a golden opportunity to do something about it and do it now—before it is too late. Tempus Fugit! I should like to propose that the Association appoint a committee to study the matter and rectify the gross injustices being perpetrated against the dairy graduate in that field which it rightly his.

Sincerely yours,

SIDNEY SHEPARD,
Milk Sanitarian,
Jefferson County Board
of Health,
Birmingham, Alabama

Mr. J. H. Shrader, Editor,
Journal of Milk Technology,
Wollaston, Massachusetts

November 14, 1942

Dear Sir:

I found the St. Louis meeting of the International Association of Milk Sanitarians both interesting and enlightening. All of the papers were well written and instructive, yet I left the convention in a rather despondent mood, and can truthfully say that what I have in mind is not pleasant.

To one who has technical training in the field and five years active experience in the field of dairy and food inspection, both in city, county, and state departments of public health, I am at a loss to explain the fact that I am ineligible to do milk and food sanitation work for the armed forces, since I am not a veterinarian or a sanitary engineer. It was stated many times at the convention by representatives of the U. S. Public Health Service that the Army of the United States and the U. S. Public Health Service looked to state and local milk sanitarians to do the routine and basic work necessary to provide adequate and safe milk supplies for the armed forces, and that the only purpose of military personnel checking milk supplies is to satisfy themselves that enforcement is being carried out in a satisfactory manner. The U. S. Public Health Service has seen fit to delegate to state milk sanitarians the authority to make surveys of milk markets, to determine their compliance with the recommended Milk Ordinance and Code sponsored by the U. S. Public Health Service. It seems inconsistent to me that qualified persons, now engaged in this work, are deemed, by the U. S. Public Health Service and the armed forces, to be qualified to appear before local governing officials, secure the adoption of milk ordinances, train local personnel, do the basic field sanitation work necessary to improve the quality of local milk supplies, secure adequate and safe milk supplies for army camps, cantonments, and personnel, and still we are not qualified to do this very same work in the uniform of the United States Army.

So far as I have been able to determine, there is absolutely no place in any branch of the army forces, either as an officer or enlisted man for persons qualified to do food and milk sanitation, unless they are a veterinarian or sanitary engineer. It seems to me that the International Association of Milk Sanitarians owes it to the younger members of the organization to present these facts to the authorities in charge of such personnel in the United States Army advising them that there are qualified individuals available whose services are not being utilized.

I can truthfully say that I have nothing to gain, personally, through this plea to you due to the fact that my military training and experience have been in the field artillery branch of the Army of the United States, and I am, at present, awaiting call in this branch. I do make this plea for those qualified individuals, now active in milk and food sanitation work, who will soon be inducted into the army, not to enter service where their qualifications and experience will aid in the protection of the health of the armed forces, but whose training and experience will be utterly disregarded.

Trusting that you will not let this plea go unheeded, I remain,

Very truly yours,
THOMAS G. MAYNARD,
Assistant Milk Sanitarian
Illinois Public Health
Department

Resolution adopted by New York Association of Milk Sanitarians for presentation to the Surgeon-General of the U. S. Army, the Secretary of War, and the Chairman of the Senate and House Committees on Military Affairs

At the annual conference of the New York State Association of Milk Sanitarians held at Albany, New York, on September 25, 1942, the program being followed by the army for the sanitary control of its fluid milk supply was considered. It was stated that this work is being performed exclusively by veterinarians commissioned in the veterinary corps who, in many instances, do not have adequate training and experience in modern milk sanitation. The discussion revealed a number of instances in which this lack of experience has led to placing emphasis on relatively insignificant phases of milk production and processing and at the same time to an oversight of factors directly affecting the safety and sanitary quality of milk supplies for the armed forces.

Milk sanitation is generally recognized today as being a highly specialized field. Trained milk sanitarians having had long experience in the sanitary control of milk supplies for large civilian populations are available and anxious to serve. Such persons, however, except for a very small percentage who happen to have veterinary degrees, are barred from serving their country in a capacity in which they could be most useful.

There are 691 persons enrolled in this Association representing official, state, and municipal milk control agencies, the quality control divisions of the milk industry, agricultural colleges, and experiment stations.

After due consideration of a report submitted by a Committee appointed to study this problem, the Executive Committee of this Association respectfully recommends (1) that persons, including veterinarians, not specially trained and experienced in the field of milk sanitation should not be assigned to the sanitary supervision and quality control of milk supplies, and (2) that consideration should be given to utilizing in the armed forces the services of trained and qualified milk sanitarians who are not necessarily veterinarians.

G. W. Molyneux, *Chairman*
Samuel Abraham
W. D. Tiedeman
George W. West

Resolution Re Milk Control Procedure

WESTERN UNION

1942 OCT 28 AM 1 15

DR. F W FABIAN=PRES

INTL ASSN OF MILK SANITARIANS HOTEL JEFFERSON ST L=
THE MASSACHUSETTS MILK INSPECTORS ASSOCIATIONS URGENTLY REQUEST THE INTERNATIONAL ASSOCIATION OF MILK SANITARIANS TO WORK OUT A PLAN FOR THE PROCUREMENT OF SAFE MILK SUPPLIES FOR CONGESTED AREAS WITHOUT DEROGATORY LABELLING DOWN OF SAFE MILK SUPPLIES FROM REMOTE PROPERLY INSPECTED AREAS AND THAT STRONG PRESENTATION BE MADE TO THE WASHINGTON AUTHORITIES THAT ALL NEW REGULATORY PROCEDURE IN THE HANDLING OF MILK BE WORKED OUT IN COLLABORATION WITH THE INTERNATIONAL ASSOCIATION OF MILK SANITARIANS=

JOHN T MANNING PRES MASS MILK INSPECTORS ASSN . .

KANSAS ASSOCIATION OF MILK SANITARIANS

The Thirteenth Annual Meeting of the Kansas Association of Milk Sanitarians held at Kansas State College, Manhattan, Kansas, on November 19 and 20 was one of the most successful in the history of the Association. The registered attendance was over 75 and every session of the scheduled day and a half meeting, including one evening session, was well attended.

The program covered a variety of timely subjects which were presented by able speakers. Each speaker demonstrated remarkable ability in selecting material which has a direct application in the field of milk sanitation under present day conditions.

Members of the Association expressed the thought that meetings of this nature are more important than ever before in helping to solve the many difficult problems confronting the milk sanitarians in the present emergency.

A similar meeting is planned for next year if circumstances will permit.

W. J. Caulfield,
Secretary.

"Dr. Jones" Says—*

SOME ideas I've got about this milk sanitation business: I ain't sure the Department up there't Albany'd agree with me but, for one thing, I'd like to see them take over the farm and plant inspection in these rural sections—that is except where they're organized on a county basis. All you've got to do is look at the record of milk-borne outbreaks (practically all of 'em in small places) to be reminded that they're the weak links in the chain—these rural towns and villages are.

Of course here in our place all the milk's pasteurized and I've got a fellow part-time to handle the farm and plant inspections and so on for me. So we manage to get along after a fashion. But, from what I hear, the majority of these town health officers, if there's any inspecting done they do it themselves—and the smaller villages. I know if I had to do that—well, I'm a doctor and not a milk sanitarian. If I took their milking machine apart I probably couldn't get it together again and I wouldn't swear I could tell a pump-stop from a stop-light. And, of course, these fellows that're selling milk—I've doctored all of 'em one time or another. Even as well as we're fixed here it's kind of a headache at times. I've been talking county health department here for a long time. If we had that it'd take care of it. But there don't seem to be anything stirring in that direction right now.

Of course the State—they claim they haven't got the force to handle it. Maybe so—but they've got more'n us fellows. The milk sanitarians they've got are fulltime and experts at it. Even if they are shorthanded the change'd be liable to be for the better.

Another thing (of course this is what you might call kind of controversial)—that's this matter of state and local milk regulations. Most of the lack of uniformity we hear about comes from local boards enacting regulations *in addition* to those in the state code. One place adds one thing and another something else. I don't see why they don't put all the requirements that're necessary in the state regulations and fix it so that'll be all there is to it—outside of possibly some little administrative provisions.

Anyway, those are something to think about. But I guess maybe this is kind of a poor time to be sticking my neck out. They might get me mixed up with some of these Christmas turkeys.

PAUL B. BROOKS, M.D.

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* *Health News*. New York State Department of Health, Albany, December 14, 1942.