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(Association Organized 1911)

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California Association of Dairy and Milk Inspectors
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Connecticut Association of Dairy and Milk Inspectors
Indianapolis Dairy Technology Club
Kansas Association of Milk Sanitarians
Massachusetts Milk Inspectors' Association
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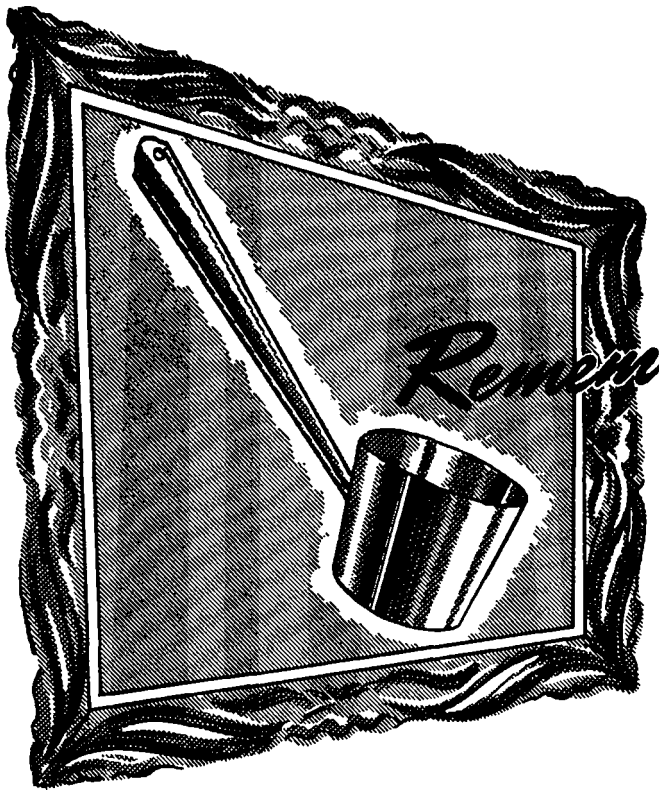

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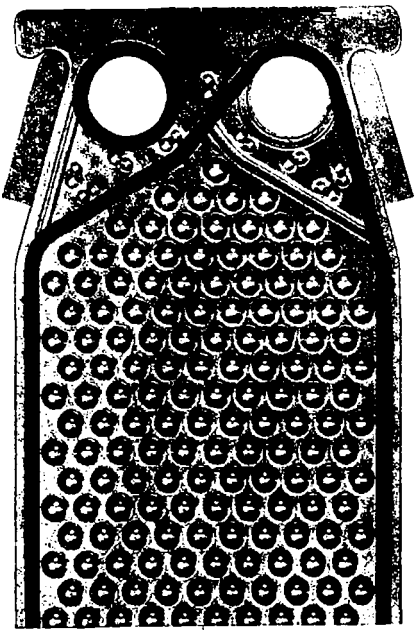

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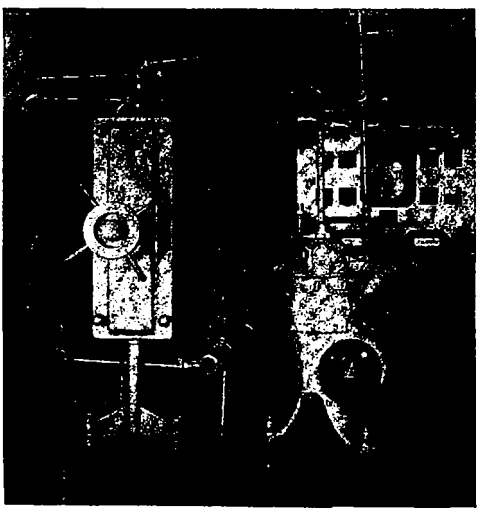

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JOURNAL OF MILK TECHNOLOGY

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(Association Organized 1911)

and Other Dairy Products Organizations

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JOURNAL
of
MILK TECHNOLOGY

Volume 4 November-December, 1941 Number 6

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 its transactions.

Leslie C. Frank *

I have been asked, as a close associate of his, to say a few words to honor the memory of the late President of this Association, Leslie Carl Frank, who died September 4, 1941. To the many of you who have received inspiration from personal contact with him, his passing leaves a sense of great loss. Even those of you who knew him only through his written and spoken work must realize that an outstanding leader in milk sanitation is no longer with us.

In pursuit of his ideal of a safe milk supply for the entire nation, he worked without stint for the last several years under the handicap of a weak heart and high blood pressure. It was not until two years ago, when a board of medical officers of the Public Health Service ordered him to reduce the tempo of his work, that even his close associates became aware of his condition. As was to be expected from one of his enthusiasm and nervous energy, the warning went unheeded, so that in his own interest he was compelled to relinquish his post as Chief of the Sanitarian Section, and was assigned to light part-time duties which would not overtax his energies. But it was impossible for him to restrain his mind and his efforts. Consequently, the Service had no alternative but to retire him from active duty in March, 1941. The end came in Toronto, where he went with his family shortly after attending his son's wedding in Michigan. He died of cerebral hemorrhage at the age of 55. He is survived by his widow, a daughter, and a son, both married.

Leslie Frank was born in Baltimore, October 13, 1886. In his youth he was far from robust, and never enjoyed the benefits of a formal high school education. He studied sanitary engineering at Cornell, then spent a year with Imhoff in Germany. Upon his return he was engaged in designing the Imhoff tanks to treat Baltimore's sewage. In 1914 he entered the U. S. Public Health Service, where in his early years he developed a woodlath sewage filter. During the World War he was in charge of the Gulf Coast Sanitary District with headquarters at Gulfport, Mississippi. Then

* Address by A. W. Fuchs at the Tulsa meeting of International Association of Milk Sanitarians, October 28, 1941.

for a few years he left the Service to become health officer of Dallas, from which position he was ousted for refusing to lower his standards and ideals when the Ku Klux Klan came into power. As health officer he developed a grading type of milk ordinance for the City of Dallas. The ex-health officer accepted the vice-presidency of a large Dallas dairy, but soon resigned because he was unable to condone the unethical practices which he encountered. For a brief period he engaged in the business of producing Certified Milk, then rejoined the Public Health Service.

From that day on, milk sanitation became his chosen field. At the request of Dr. Welch, then State Health officer of Alabama, Mr. Frank was assigned to that State in 1922 to assist in formulating a model milk ordinance to be recommended for adoption by local communities. Throughout this program, he consulted leaders in the milk industry and in milk sanitation and accepted modifications when convinced of their merit. Within one year, seven cities in Alabama adopted the model ordinance. It soon attracted the attention of health officers in Texas, North Carolina, Mississippi, and other nearby states, and adoptions grew apace. At the time of his death, the program which he had fathered was in effect in over 2300 communities located in 34 states. This was undoubtedly one of the most fruitful public health programs ever undertaken.

Volumes could be written on the battles he fought, on the researches he directed, on the papers he wrote, on his outstanding contributions to modern pasteurization practice in the interest of milk sanitation. In 1927 he prepared the first draft of the interpretative code to accompany the milk ordinance, a work which later became known throughout the country. This code has been revised through many editions with the advice of the Public Health Service Milk Sanitation Advisory Board, appointed in 1932. His educational pamphlet, "What Every Person Should Know About Milk," has been an outstanding "best seller"; since its publication in 1934, several hundred thousand copies have been printed.

Two years ago the Surgeon General gave recognition to Mr. Frank's ability by appointing him Chief of the new Sanitation Section of the Domestic Quarantine Division, formed by combining the Sanitation Section of the National Institute of Health with the Engineering Section of the Domestic Quarantine Division. This position, with its wider responsibilities and activities, he held until his retirement.

Leslie Frank possessed an enthusiasm which was contagious and inspiring to all who knew him. He was an optimist whose optimism was justified by results achieved through his untiring energy. His keen mind and ready wit made him an interesting companion. His hobbies included photography and music. He was fond of relating how his father, who had been an orchestra conductor, refused to let him play any musical instrument for fear the boy might become a penniless musician. It was not until later years that Frank was able to indulge his desire by learning to play the cello.

In his death we mourn the loss of a good friend and a great leader.

Facing the Facts

"You people talk too much about milkborne infection!" Many probably would agree with this remark made to a state health official by a dairyman who happens, also, to be a physician and local health officer. His point was that we were "hurting the milk business." A surprisingly different viewpoint was reflected when a very serious milkborne epidemic of septic sore throat in a village in the same state, dealers in pasteurized milk in a nearby city joined in a series of full-page newspaper advertisements calling attention to the epidemic and urging the use of pasteurized milk. The purpose of their publicity was to stimulate action–which it did, to their advantage.

That the prevention of the spread of infection through milk is the primary and principal purpose of our work in the field of milk sanitation is too often overlooked. We have made little more than a beginning in this direction. This is largely due to failure of the public to understand the need for protection and the practical and fairly simple means of attaining it. The corollary is a very general lack of the public sentiment needed to support competent official activity, to stimulate the lethargic, and to eliminate the incompetent. The remedy indicated for immediate administration is publicity in concentrated and repeated doses.

In the meantime the most urgent need at the official "level" (with apologies for the use of this now hackneyed term) is for better organized and more efficient epidemiological work. Recognition of communicable disease outbreaks, when they occur, depends chiefly on getting cases reported by physicians, and by systematic and intelligent study of case reports at the central health agency. It requires organization, cooperation, and watchfulness. To determine whether milk is responsible for an outbreak and, if so, how it happened, specialized skill, training, and experience are required. It is not a job for the average health officer or milk sanitarian any more than running down a murderer is a job for a traffic cop. If outbreaks are to be prevented and controlled, causes must be accurately determined. Guessing and jumping to a conclusion defeats the purpose of investigation, misleads others who accept the conclusion, may do an injustice to an innocent party, and contributes to public confusion. Accuracy is essential to good epidemiology.

Much has been said about "missed" milkborne epidemics. Discovery and investigation, however, are not enough. We owe it to the public, the milk industry, and ourselves to assure that our determinations be dependable. When milk is charged with responsibility for an outbreak, we should be prepared to prove it. Hope of improvement lies in facing the facts.

P. B. B.

Kansas Joins the Journal Family

At the twelfth annual meeting of the Kansas Association of Milk Sanitarians, this Journal was designated to be their official organ, and much interest was expressed in becoming associated with the growing list of dairy organizations which constitute the Journal family. We welcome this fine group of milk sanitarians into our number. Such a closer tie to kindred organizations should redound to the benefit of all and each. Good for you, Kansas! We have the green light.

J. H. S.

Annual Report of the Secretary of the International Association of Milk Sanitarians - 1941

The record of the Association during the past year indicates that there has been growth in membership but more significant, growth in activities and influence.

The membership is now 1146, of which 255 are new members. The active and associate members number 318 and 828 respectively. Our membership is drawn from 43 states, the District of Columbia, Hawaii, Alaska, Canada, Mexico, Colombia, (South America), British West Indies, Ireland, England, and Thailand. Three members died during the year.

In the death of our President, Leslie C. Frank, we have lost a member who through his knowledge, industry, personality, and high ideals rightly became a leader.

From correspondence and observation, there is no doubt but that the JOURNAL OF MILK TECHNOLOGY has reached and is maintaining an enviable position in the dairy industry. Circulation is over 2300. The untiring effort of the managing editor and editor is responsible to a great degree for the successes achieved. It is believed that a policy may soon be adopted whereby the association may recompense the editors to a greater extent than has been possible heretofore.

The cooperative work of our Association with the International Association of Milk Dealers and the Dairy Industries Supply Association is outstanding, yet it is not receiving the recognition which it deserves. Equipment which has been approved by the committees of the three association has received careful, thorough, scientific, and practical consideration. Health officers and milk control officials can, with confidence, and should accept any such approved equipment, knowing that it will meet rigid specifications as to design, construction, materials, and sanitation. All control officials should recognize the "Three A" approval.

This Association has an important part to play in our national defense program. Each member is concerned, each can personally assist. Reports from all sections of the country make this fact plain, viz: that we are faced with a condition which makes it imperative that all milk control officials take a common sense attitude of the policies of the Priorities Board of the Office of Production Management. No one person or agency has the slightest desire to hinder or retard any effort which is being made to promote public health or to diminish the gains already made. However, we have been depending up until now upon materials and labor which are now essential for national defense. Starting now, we will be using material which is new to us, yet which will do the job we desire. We will have to get along with used equipment which in times past we would have called "obsolete" or "worn out." There is much of this equipment which, with proper repairs, renovating and operation, could continue to function properly. Government agencies, manufacturers, and plant operators are bending every effort to find or develop substitutes for those materials now so vital to the defense industry. All health officers should recognize these facts and approve those substitutes which will be available and which will in no way endanger the safety of our milk supplies. The same line of reasoning and action should be followed when a decision must be made regarding used equipment. Cooperation with the O. P. M. will not result in lowering the standards which have been set for a safe milk supply. The dairy industry has been classed as an essential food industry and so is entitled to an A10 priority rating.

To the individuals, committees, organizations, the officers of the association, and to the editors of the Journal who have cooperated with the association in its work, your Secretary is deeply indebted. Any successes which have been attained are due to this splendid team work.

Respectfully submitted,

C. S. LEETE, *Secretary*,
International Association of Milk Sanitarians.

The U. S. Public Health Service Restaurant Sanitation Program *

A. W. Fuchs
Senior Sanitary Engineer, U. S. Public Health Service, Washington, D. C.

NEED FOR PUBLIC HEALTH CONTROL OF EATING AND DRINKING ESTABLISHMENTS

According to the Public Health Service compilation of disease outbreaks conveyed through various vehicles in 1939, the number of outbreaks reported by state and city health departments from foods other than milk was greater than for all other vehicles combined. Water supplies were responsible for 43 outbreaks, milk and milk products for 41, other foods for 148, and unidentified vehicles for 17. Of the 148 food-borne outbreaks, 88 involved food poisoning, 37, gastro-enteritis and dysentery, 9, botulism, 5, typhoid fever, 4, trichinosis, 2, paratyphoid fever, 1, scarlet fever, and for the remaining 2 the disease was not given.

Of the 47 food-borne outbreaks for which the type of establishment was reported, all but 4 were traced to establishments regularly serving public or semi-public meals, including restaurants, clubs, hotels, camps, schools, and public institutions. The number of public eating and drinking establishments responsible for outbreaks cannot be definitely determined from these reports, but there is every indication that it is significant, and that greater attention to restaurant sanitation is warranted.

While it is impossible to estimate the amount of disease actually spread through public eating and drinking establishments, there is no doubt that food and utensils may be infected by organisms from the saliva and other body discharges. The organisms may be transmitted by direct or indirect contact from a case or carrier among the customers or the employees. They may be coughed or sneezed on food, dishes, or utensils. They may be left on glasses, cups, spoons, and forks by mouthing. They may reach the dishwater from washers or indirectly from customers. Or cleaned dishes may be exposed to contamination by handling or droplet infection.

DEVELOPMENT OF RECOMMENDED ORDINANCE AND CODE

The Public Health Service first became actively interested in the sanitation of eating and drinking establishments in 1934. In that year minimum restaurant sanitation regulations were proposed by the Committee of the Conference of State and Territorial Health Authorities, the Committee of the National Restaurant Code Authority, and the U. S. Public Health Service, for approval by the National Recovery Administrator in connection with Section IV, Article VIII of the Code of Fair Competition for the Restaurant Industry. So far as is known, these regulations were never put into effect, as the National Recovery Act was declared unconstitutional by the Supreme Court not long afterwards.

Next, at the request of some health officers for a suggested form of ordinance for local use, the Public Health Service prepared the December 1935 draft of An Ordinance Regulating Food and Drink Establishments. This draft was mimeographed, but was not circulated except on request.

As a result of successful experience with the Standard Milk Ordinance, an increasing demand arose on the part of

* Read before meeting of the International Association of Milk Sanitarians at Tulsa, Oklahoma, October 27, 1941.

health officers for an ordinance and interpretative code on restaurant sanitation. In 1937 the Office of Milk Investigations became the Sanitation Section of the Division of Public Health Methods in the National Institute of Health, and was no longer confined to milk activities. Accordingly, after a detailed study of 18 existing municipal ordinances and state regulations, a tentative Ordinance and Code Regulating Eating and Drinking Establishments was issued in mimeographed form in March 1938. This edition was designated as "tentative" because it had not yet been reviewed by the Public Health Service Sanitation Advisory Board. In spite of its tentative nature there were many requests for copies, and it was adopted as a local ordinance or as state regulations in many areas.

It was not until 1940 that the Public Health Service Sanitation Advisory Board had an opportunity to review the tentative edition and consider proposed amendments. Following this meeting, the first non-tentative edition of the recommended Ordinance and Code Regulating Eating and Drinking Establishments was issued in mimeographed form in June 1940.

The latest edition is, therefore, the culmination of six years' effort represented by four different drafts. It embodies the best information at present available on restaurant sanitation, but like the other codes recommended by the Public Health Service, it should be considered subject to change as improvements are developed through research and experience. It is recommended for voluntary adoption by states, counties, health districts, and municipalities in order to encourage a greater uniformity and a higher level of excellence in the sanitary control of eating and drinking establishments. This edition has been incorporated in both the 1940 and the 1941 editions of the Sanitation Code suggested by the Public Health Service for State or local adoption in national defense areas.

Inspection forms were prepared to accompany both the 1938 and the 1940 editions. These were multilithed and have been available for distribution in limited quantities only. However, the demand for supplies of the 1940 inspection form for local use has become so great that it is being printed by the Government Printing Office and will be available in the near future for quantity purchases by health officers. It is planned to prepare and print office ledger record forms for posting inspection and laboratory results, and sanitation rating forms for use by the states in measuring the effectiveness of local control programs.

PHYSICAL EXAMINATION OF EMPLOYEES

Naturally, many diverse viewpoints had to be coordinated in drafting an ordinance that would be generally applicable. Among the questions at issue was whether to require physical examination of food handlers in restaurants. Such a requirement was included in the 1935 draft but has been deleted from both the 1938 and the 1940 editions. During its consideration of these Codes the Public Health Service Sanitation Advisory Board debated the advisability of including a provision for health examinations but concluded that the conflicting opinions of health officers on the value of routine medical examinations for food handlers did not warrant such a requirement. For example, the experience of New York City as reported by Dr. Best [*A.J.P.H.*, **27**, 1003-6, (1937)] indicated that examinations made by private physicians were not considered reliable, and that the cost of adequate examinations by the health department was not commensurate with the public health benefits obtained. New York City has therefore discontinued annual examinations of food handlers.

Admitting that periodic examinations are unwarranted, it may be asked whether examinations made only before or at the time of employment are worth while in the case of food handlers. This is the procedure suggested in the current milk ordinance recommended by the Public Health Service, but even in that case examination of milk handlers on farms producing milk for pasteurization is not recommended because of the large numbers involved. Employees of eating and

drinking places are even more numerous, and the turnover is greater. The Advisory Board therefore concluded that even initial health examinations should not be required in a restaurant ordinance that is recommended for general adoption. However, health officers who inquire are informed that they may include such a requirement at the time of adoption if they prefer to do so, and if their official facilities for making examinations are adequate for the task.

Lest it be inferred that the recommended ordinance makes no provision for the control of communicable disease, attention is called to section 10, which makes the manager and the employee jointly responsible for the prompt reporting to the health officer of all cases of communicable disease, and to section 11, which authorizes the health officer to make adequate medical examinations of employees when infection is suspected, and to exclude infected employees from all eating and drinking establishments.

GRADING

Another question that arose was that of grading. Should the ordinance provide for grading, or should it merely specify the minimum requirements to be met by all eating and drinking establishments? This question was settled by offering two different forms of the 1940 ordinance, one a grading type which permits enforcement by degrading or permit revocation or both, the other a non-grading minimum-requirements type enforceable by permit revocation only. Many health officers will prefer the grading type of restaurant ordinance because it offers them a choice of enforcement devices, and because experience with a grading type of milk ordinance indicates the advantage of being able to degrade for minor violations which the health officer would hesitate to punish with so severe a penalty as suspension of permit. Nevertheless, some health officers will prefer the non-grading form. Attention is called to the fact that the sanitation requirements for Grade A restaurants in the grading form of the ordinance are identical with the minimum requirements in the non-grading form.

PROVISIONS OF THE ORDINANCE

The restaurant ordinance and code follows the same general form as the Standard Milk Ordinance which has had such wide acceptance. Part I is the short enabling form of the ordinance suggested for use wherever adoption by reference is considered legal. The short form greatly reduces the cost of publication, and is more readily kept up to date because it is so easily amended. Two short forms are presented, one a grading type, the other a non-grading type. Part II is the unabridged ordinance recommended for adoption only where the short enabling form is not legal. All words referring to grading are enclosed in parentheses, so that the grading form of the unabridged ordinance is obtained by omitting the parentheses signs only, while the non-grading form is obtained by deleting both the parentheses signs and the words included therein. Part III is the interpretative code, which gives the public health reason for each requirement of the ordinance and explains in detail what constitutes satisfactory compliance.

A brief outline of the provisions of the recommended restaurant ordinance may be of value in this discussion.

Section 1 deals exclusively with definitions of restaurant, itinerant restaurant, utensils, health officer, etc.

Section 2 deals with the issuing, suspension, and revocation of permits.

Section 3 requires the public display of a grade notice in all restaurants where the grading form of the ordinance is in effect. The grade display is the means whereby the competitive effect of grading tends to improve restaurant sanitation.

Section 4 authorizes the examination and condemnation of unwholesome or adulterated food or drink.

Section 5 requires the inspection of all restaurants at least once every 6 months. A restaurant found violating any item of sanitation must be notified in writing and must be given a reasonable time to correct the defect. If the same violation is again found on the next inspection, the restaurant is subject to degrading or suspension of permit. In the next edition of the Code it is planned to insert the

following explanatory material under section 5:

"Whenever a violation is discovered, the inspector should point out to the management the requirement that has been violated, should explain the public health reason for the requirement, and should suggest methods for correcting the defect. An educational rather than a policeman type of approach is recommended.

"The punishment devices of degrading or suspension of permit are provided in order to prevent continued violation of the provisions of the ordinance, but the wording is designed to protect the industry against unreasonable or dictatorial action. An establishment found violating any item of sanitation must first be notified in writing, and must be given a reasonable period of time in which to correct the defect before a second inspection is made. After receipt of the notice of violation, but before the allotted time has elapsed, the management has an opportunity to appeal to the health officer or the board of health from the inspector's interpretation or for an extension of the time allowed for correction. Not until the second inspection has revealed failure to correct the defect is the restaurant subject to degrading or suspension of permit. Even then the management still has the legal right to refuse to display the lower grade notice or to continue operating after the permit has been suspended, and to rely for vindication on court action instituted by the health officer. It is only fair to state, however, that the courts usually sustain the health officer unless the ordinance requirement or interpretation is demonstrated to be unreasonable."

Section 6, the longest and most important of the sections, lists the sanitation standards for grade A restaurants, which are identical with the minimum requirements where the non-grading form is adopted. These cover construction and cleanliness of floors, walls and ceilings, doors and windows, lighting and ventilation, toilet, water supply, handwashing facilities, disposal of wastes, the construction, cleaning, bactericidal treatment, storage, and handling of containers and equipment, refrigeration of readily perishable foods, wholesomeness of food and drink, including milk, milk products, and shellfish from approved sources, storage and display of food and drink to avoid contamination, cleanliness of employees, and miscellaneous requirements. These items of sanitation are conveniently summarized in the inspection form prepared for use with this ordinance.

Perhaps the most important item of this section is item 10, on cleaning and bactericidal treatment of utensils and equipment.

In the grading form of the Ordinance, the remainder of section 6 is concerned with specifications for grade B, grade C, and itinerant restaurants. Grade B restaurants are those which fail to meet certain grade A requirements that are not of major public health significance. In communities which are not yet in position to limit operations to restaurants of the highest grade only, the grade B definition serves as the specifications for the second grade. In municipalities which under section 7 permit none but grade A restaurants to operate, except during temporary degrading periods, grade B serves a useful role as a penalty grade to which grade A restaurants may be temporarily degraded for minor violations which the health officer would hesitate to punish with so severe a penalty as suspension of permit.

Grade C restaurants are those which violate any of the requirements for grade B restaurants. Where the grading ordinance is in effect, grade C serves as a temporary penalty grade for those restaurants which fail to satisfy the grade A or the grade B requirements. If any restaurant which has been degraded to grade C fails to qualify for a higher grade within the 30 day period specified in section 7, its permit is suspended.

Itinerant restaurants (i.e., those operating for temporary periods in connection with a fair, carnival, circus, public exhibition, or similar gathering) are required to comply with certain reasonable minimum requirements which are listed.

Section 7 provides that after 12 months

following adoption, no restaurant may continue in business unless it complies with the minimum requirements, or (in case the grading form is in effect) unless it qualifies for grade A or grade B. Communities in position to do so may restrict operations to grade A restaurants only, except during temporary degrading periods not exceeding 30 days.

Section 8 outlines the procedure for reissuing of the permit or for regrading upward any restaurant whose permit has been suspended or which has been degraded.

Section 9 prohibits the use of any polish containing cyanide preparations for the cleansing or polishing of utensils.

Section 10 requires the restaurant manager to notify the health officer of any communicable disease among his employees, and section 11 confers on the health officer broad powers of control when infection is suspected.

Section 12 specifies that enforcement shall be in accordance with interpretations contained in the Code. In section 13, on penalties, the exact wording is left to the community. The last two sections deal with the usual provisions regarding repeal, date of effect, and unconstitutionality.

EXTENT OF ADOPTION

The Public Health Service urges states not already doing so to launch a restaurant sanitation program along the same lines as the milk control program. A satisfactory state program would include the appointment of a restaurant sanitarian where necessary, promotion of the local adoption of the ordinance by municipalities, counties, and health districts, the training of local inspectors, provision for consultant service to local health departments on technical problems, and the measurement of the effectiveness of local control programs by means of sanitation ratings. The promulgation of this ordinance as state regulations may serve to encourage its local adoption by cities and counties within the state. Most states will prefer to delegate the enforcement of such state regulations to local health units where these are functioning.

In response to inquiries from many health officers the Public Health Service recently circularized all state health departments to determine the extent of adoption of the recommended restaurant sanitation ordinance. Although no replies have to date been received from 3 of the states, the incomplete returns indicate that the ordinance or state regulations based thereon is legally in effect in communities located in 24 states and 1 territory.

In 6 of the states, the State Board of Health regulations, based on or similar to the restaurant ordinance recommended by the Public Health Service, are enforced state-wide; in 3 of these (Nevada, Oklahoma, South Carolina) by the state health department, and in 3 (Kentucky, Mississippi, North Carolina) by both state and local health agencies. In 5 other states (Arkansas, Florida, Georgia, Indiana, Missouri) which have adopted such regulations, enforcement is not state-wide but is left to local health officials. Six of the state regulations are based on the 1938 edition, 5 on the 1940 edition.

This ordinance, or similar ordinances or regulations based thereon, has in addition been legally adopted by 74 counties and by 123 municipalities, located in 19 states. Of these, 38 located in 4 states (Arkansas, Florida, Kentucky, Ohio) adopted the state board of health regulations, 74 located in 3 states (Alaska, Illinois, Virginia) adopted the state health department's model ordinance based on that of the Public Health Service, and 85 located in 15 states (Arkansas, Georgia, Idaho, Illinois, Iowa, Maryland, Michigan, Minnesota, New Mexico, North Dakota, Ohio, Oklahoma, Tennessee, Texas, Washington) adopted the Public Health Service ordinance. Approximately two-thirds of the ordinances adopted locally correspond to the 1938 edition, the remainder to the 1940 edition.

A voluntary local program of restaurant sanitation with the Public Health Service ordinance used as a guide but without legal adoption is reported under way in communities in 4 states (Idaho, Indiana, Maryland, Washington).

That additional adoptions are being

considered is indicated by the reports from a number of States. Eight States and territories (Alaska, Arizona, Louisiana, Montana, Rhode Island, Utah, Washington, West Virginia) are planning to adopt State Board of Health regulations based on the recommended restaurant ordinance, and 53 counties and municipalities located in 15 states are considering its adoption as a local ordinance.

It is evident, therefore, that the restaurant sanitation ordinance recommended by the Public Health Service is proving very popular with health officers. It is suitable for adoption by states, counties, and municipalities both large and small, and by areas which advocate grading as well as those which prefer minimum requirements. It is particularly useful at this time in connection with the sanitation of national defense areas, in many of which the ordinance is already in effect.

Sewage Treatment. Karl Imhoff and Gordon M. Fair. Book Review. John Wiley & Sons, Inc., 1940, 370 pp. *Pub. Health Eng. Abs.* xx, S, 94.

This is a joint effort of the authors to present briefly and simply the considerations and calculations which enter into the design and operation of modern sewage-treatment plants, the disposal of industrial wastes, and the disposal of effluents in streams. The table of contents gives:

(1) General considerations.
(2) Composition of sewage.
(3) Screening and skimming.
(4) Chemical precipitation and rapid filtration.
(5) Sedimentation.
(6) Principles of biological treatment.
(7) Treatment on natural soil.
(8) Treatment on coarse-grained beds.
(9) The activated-sludge process.
(10) Chlorination.
(11) Sewage sludge.
(12) Sludge digestion.
(13) Sludge gas and its utilization.
(14) Sludge treatment, disposal, and utilization.
(15) Water-carried wastes from unsewered habitations and industrial establishments.
(16) Origin and treatment of common industrial wastes.
(17) Self-purification of receiving waters.
(18) Disposal of sewage in receiving waters.
(19) Sample calculations.

The book is an interesting attempt to give a world-wide viewpoint on procedure and practice in concise form. It is of value to readers who are experienced enough to recognize the differences in German, British, and American practice, and for those who wish to supplement a general knowledge of sewage disposal and stream pollution by special studies of design or, for instance, oxygen relations in stream studies.

The experienced sanitary engineer, familiar with the care and discrimination of the authors in the selection of design and research data, will derive helpful stimulation and enjoyment from a careful study of this book, including the design problems and oxygen balance computations, which provide excellent mental discipline. In short, it is a "different" book.

LANGDON PEARSE.

Staphylococcus Aureus Contamination of a Grade "A" Raw Milk Supply *

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Food poisoning due to staphylococcal contamination of foods is recognized as being clinically different from other types of food poisoning. Many foods are incriminated in this type of food poisoning outbreak, chief among these being bakery goods (Haynes and Hucker) (1). Staphylococcal contamination of milk and milk products is now recognized as a potential cause of food poisoning outbreaks.

Minnet (2) reported in 1936 that hemolytic staphylococci found in the udder of cows were capable of setting up food poisoning in man. Gwatkin (3) in 1937 reported 30 cases of staphylococcic mastitis, 20 of which occurred in two herds in which no other pathogenic organisms were isolated. In the experience of Shaughnessy and Grubb (4), outbreaks due to milk were found only when one or more of the cows producing the milk had staphylococcic mastitis. They also reported, as did Plastridge (5) in 1938, that milk consumed by the victims of food poisoning appeared normal to them in appearance, odor, and flavor despite the fact that the animals supplying the milk had a staphylococcic mastitis.

Seven outbreaks of food poisoning in a small southern college were reported by Crabtree and Litterer (6) in 1934. Enterotoxin production in improperly refrigerated milk was found to be responsible for the outbreaks which affected over 50 percent of the student body. A portion of the milk was properly refrigerated in the residences of the school principal and the farm manager, and its use during the time of the seven outbreaks caused no symptoms in the members of either household. *Staphylococcus aureus* strains recovered from the vomitus, throats of the food handlers, and the milk were identical to strains drawn aseptically from the udders of two of the thirteen cows supplying milk for the school.

Staphylococci have appeared irregularly, in the past, in control plates from raw market milk samples examined in the Bacteriological and Serological Laboratories of the City of Louisville Department of Health. In November 1940 staphylococcus colonies of varying degrees of chromogenicity began to appear with marked regularity in the routine agar plates from samples of raw market milk. Because of the importance of this finding, from the public health standpoint, it was deemed necessary to classify them into pathogenic and non-pathogenic strains.

In a report on the "Pathogenic Staphylococci", Blair (7) in 1939 reviewed the work of many authors: Thompson and Khorazo (10), Cruickshank (9), Gwatkin (3), Plastridge (5), Chapman (8) and Haynes and Hucker (1). These investigators concluded that a high degree of correlation existed between the formation of coagulase from human or rabbit blood plasma and the pathogenicity of the staphylococcus strain. Likewise nearly all mannitol-fermenting strains of staphylococci have etiological importance, i. e. produce enterotoxin. The formation of yellow pigment and the ability to hemolyse red blood cells can no longer be assumed to indicate pathogenicity of the staphylococci. However, it is undoubtedly true that the majority of pathogenic

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TABLE 1

Milk Samples from Individual Members of Ten Herds

Herd No.	No. of samples	Samples showing agar plate counts over 1000 per cc.	Samples showing strains of *Staphylococcus* *aureus*	*albus*	Strains coagulase positive *Staphlyococcus* *aureus*	*albus*	Strains mannitol positive *Staphylococcus* *aureus*	*albus*	Samples showing leucocyte count over 500,000 per cc.	Samples showing *Streptococcus agalaciate*
1	37	25	20	9	12	6	18	3	11	4
2	20	7	7	4	6	1	5	3	2	2
3	83	68	32	10	27	5	26	5	39	3
4	34	20	12	5	5	2	6	5	6	0
5	28	16	10	6	7	2	6	3	11	0
6	4	3	4	0	2	0	2	0	1	0
7	50	35	27	9	8	4	12	6	15	1
8	31	20	12	7	10	5	5	4	7	0
9	48	42	29	8	17	4	9	3	25	0
10	52	25	35	6	25	3	21	5	18	1

staphylococci are of *Staphylococcus aureus* type and no sharp line of demarkation exists between the pale yellow *aureus* strains and the borderline cream-colored *albus* strains.

The kitten test of Dolman (11) has been used extensively in recent years for the determination of the enterotoxin formation by staphylococci. Vomiting and general weakness in the kitten are said to follow, within an hour, the intraperitoneal injection of a filtered staphylococcus culture containing the enterotoxin. Singer and Hagan (12) claim that in a study of a series of staphylococci isolated from pathological processes their results were at variance with those of Dolman (11). They reported vomiting in about 25 percent of the tests where uninoculated filtrates were used, and claimed that filtrates presumed to contain enterotoxin failed to cause vomiting in nearly half of the cases. Because of the adverse findings of Singer and Hagan (12) in the use of the Dolman kitten test (11) we decided to rely on the fermentation of mannitol and the coagulation of blood plasma by the staphylococci in order to establish them as pathogenic and therefore potential food poisoning strains.

Staphylococcus colonies, some of them in pure culture, appeared on the agar plates of all ten of the raw market milk supplies under examination. Many of these colonies were of the *aureus* type while a few of them were the white *albus* type. Most of the strains when streaked on rabbit blood agar produced hemolysin, and a majority of them fermented mannitol and produced coagulase in rabbit blood plasma, thus classifying them as potential pathogenic strains.

The examination of samples, milked aseptically from individual cows in each of the raw milk herds, revealed that over 50 percent of the animals were shedders of staphylococci. The results of the examination of these individual cow samples for staphylococcus colonies, leucocytes, mannitol fermentation, coagulase formation, and *Streptococcus agalactiae* are shown in Table 1. Samples were examined from 387 animals in the ten

herds. Two hundred and sixty-one or 67 percent of the samples gave agar plate counts above 1000 per ml.; 48 percent of the samples showed *Staphylococcus aureus* colonies, and 16 percent *Staphylococcus albus* colonies on agar plates.

Of the 183 *aureus* strains, 119 or 65 percent were coagulase positive, and 110 or 58 percent were mannitol positive. Of the 64 *albus* strains, 32 or 50 percent were coagulase positive and 33 or 51 percent were mannitol positive. The high percentage of coagulase positive and mannitol positive strains found was due probably to the fact that several staphylococcus colonies were isolated and studied from each of the agar plates, inoculated from the individual cow samples. It was unusual that only 11 strains of *Streptococcus agalactiae* were isolated from 387 samples, the major portion of which were from apparently infected udders.

The isolation of pathogenic microorganisms in large numbers combined with other microscopic and clinical findings indicates a pathological condition, and points to the possibility of a milk-borne food poisoning epidemic. This condition, according to the United States Public Health Milk Ordinance and Code (13), warrants the removal of the infected animals from the milking herds.

The laboratory and clinical findings in this investigation indicated the removal of a very large number of animals from the raw milk herds. As this large removal would be unsound economically it was recommended that those animals suffering the most advanced types of mastitis, as indicated by laboratory and clinical findings, be removed from the milking herds and isolated for further observations.

The realization of the seriousness of a possible milk-borne food poisoning epidemic led the raw milk producers to a decision for 100 percent pasteurization of the raw milk supply.

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A Comparison of Microscopic and 32°-T-G-M Agar Plate Counts On Raw Milk

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Ever since the establishment of the standard plate count as a method for the enumeration of bacteria in raw milk, public health officials have established maximum bacterial counts for raw milk whether for consumption as raw or pasteurized milk.

Wherever these regulations went into effect, sellers or buyers of raw milk have looked for a rapid test to determine the bacterial content of their raw milk, because the standard plate count required forty-eight hours before results could be known. Before that time the product would be on the market and subject to milk inspection authorities with resulting legal action if the bacteria counts exceeded the limits set by law. Therefore, a rapid test for the enumeration of bacteria in raw milk was in order.

Chemical tests, using methylene blue and resazurin dyes, were resorted to, but there were no definite correlations between these tests and the standard plate count which would guarantee that the milk would fall within the regulations. Bacteriological methods were tried, the most important of which included the use of the microscope. A microscopic count of bacteria in raw milk, using the Breed smear technique, could be made in twenty minutes. When standard plate counts, made on the same sample employing the old nutrient agar, were compared with microscopic counts, however, the data indicated that the plate count had to be multiplied by two, three, or four to approximate the microscopic count. No one knew just what factor to use.

With the advent of the new tryptone-glucose-skim-milk agar medium and the 32° C. temperature of incubation as an improvement over the standard plate count method, it was noticed that microscopic counts closely paralleled standard plate counts on raw milk. In January of 1939, the Laboratory Staff of New England Dairies began to investigate this close correlation between microscopic counts and standard plate counts, using the improved agar medium, with two objectives in mind: one, to find out whether or not the microscope would give the same results in twenty minutes that the plate count method would give in forty-eight hours; two, to find out whether or not the microscope could supplant the plate count method for the enumeration of bacteria in raw milk when the new culture technique was used. Achievement of the first objective would enable sellers and buyers of raw milk to reject poor quality milk before it was offered for sale and subject to analysis by milk inspection departments. Achievement of the second objective would eliminate the costly standard plate count procedure on raw milk in the laboratory routine.

EXPERIMENTAL PROCEDURE

The entire project was carried out under practical conditions in a commercial dairy laboratory, and the data covered a period of two years. The samples were from mixed herd milk arriving at Boston from Vermont, New Hampshire, and Maine in cans, tank trucks, and tank cars. A microscopic and standard plate count were made on each sample. Grade A milk was plated one to one hundred, Grade B milk one to one thousand dilution.

For the microscopic work a binocular microscope with a factor of 600,000 was used, and twenty fields were counted on each sample. Clumps of the same type of

TABLE 1

Grade A Raw Milk

Microscopic range	0 - 50,000 bacteria per ml.
Number of comparisons	301
Average microscopic count	35,000 bacteria per ml.
Average standard plate count	33,000 bacteria per ml.
Number of standard plate counts over 50,000	28
Percent of standard plate counts over 50,000	9%

NOTE: No samples which gave a microscopic count of 30,000 bacteria per ml. had a plate count above 50,000 bacteria per ml.

bacteria were counted as one. If the clumps showed signs of breaking up, the groups were counted individually. The Breed smear technique was employed using Newman-Lampert methylene blue stain, and a 0.01 ml. standardized loop purchased from the Wilkens-Anderson Company in Chicago, Illinois. The standard plate method was performed as outlined in "Standard Methods of Milk Analysis" of the American Public Health Association using the new tryptone glucose skim milk agar medium at an incubation temperature of 32° C. A Phelan colony counter was used. High count plates were estimated. The sampling, microscopic, and plate work was performed by five members of the Laboratory Staff. The comparisons on the 4,599 samples were based on the microscopic counts arranged in groups so that arithmetical averages could be used. Replicate microscopic or plate counts were not performed, because, as stated heretofore, this work was carried out under conditions existing in a commercial laboratory.

RESULTS

The regulations of the Boston Board of Health will be taken into account in order to explain more fully the results. These regulations set a maximum bacteria count on raw Grade B milk of 400,000 bacteria per ml.; 50,000 bacteria per ml. on raw Grade A milk. Any quick test to enumerate bacteria in raw milk would have to compare reasonably with the standard plate count method because that is the method used by the Board of Health to enumerate bacteria in milk.

The data in Table I show the close correlation between the average microscopic count and the average plate count on 301 samples in the microscopic range 0-50,000 bacteria per ml. Analysis of the 301 individual comparisons indicated that Grade A raw milk with microscopic counts of 30,000 or below fell within the legal limit of 50,000 standard plate count 100 percent. Microscopic counts between 30,000 and 50,000 had a correlating standard plate count which was above the 50,000 limit 9 percent of the time.

In the microscopic range of 51,000 to 100,000 bacteria per ml. (Table II), the average microscopic count was 65,000. The correlating standard plate count averaged 51,000 on 344 samples. 217 of these 344 samples had plate counts below 50,000 per ml. or 63 percent. 219 of the 344 samples had microscopic counts running about 60,000 (average of 2 bacteria in 20 fields). Seventy-eight percent of the 219 microscopic counts gave corresponding plate counts below 50,000.

In the microscopic range groups of Table III and IV the average microscopic counts were lower than the average plate

TABLE 2

Grade A Raw Milk

Microscopic range	51,000 to 100,000 bacteria per ml.
Number of comparisons	344
Average microscopic count	65,000 bacteria per ml.
Average standard plate count	51,000 bacteria per ml.
Number of standard plate counts below 50,000	217
Percent of standard plate counts below 50,000	63%

TABLE 3

Grade B Raw Milk in Tank Trucks

Microscopic range	101,000 to 200,000	201,000 to 300,000	301,000 to 400,000	401,000 to 500,000	501,000 up
Number of comparisons	1,707	903	274	129	56
Average microscopic count	159,000	230,000	339,000	434,000	890,000
Average standard plate count	213,000	260,000	372,000	435,000	795,000

counts in the 101,000 to 400,000 groups, equal in the 401,000 to 500,000 group, and higher in the 501,000 and up group. Taking into account the regulation of the Board of Health covering Grade B milk (maximum of 400,000 bacteria per ml.) analysis of 1,142 comparisons in the microscopic range of 201,000 to 300,000 indicated that none of the corresponding plate counts were above 400,000 bacteria per ml. In the microscopic range of 301,000 to 400,000 the corresponding plate counts were above the 400,000 limit 27 percent of the time (400 comparisons). However, when the microscopic range was between 301,000 and 350,000 the corresponding plate counts were above the 400,000 limit 11 percent of the time. The maximum individual count of this 11 percent above 400,000 was 420,000.

DISCUSSION OF RESULTS

The close correlation between the average microscopic and plate counts on Grade A milk (microscopic range 0-100,000 per ml.) may be due to the fact that low count milk contains very few clumps of bacteria. It was observed in this study that the bacteria occurred for the most part singly and in pairs.

In Tables III and IV it will be observed that microscopic counts in the range groups of 101,000 to 500,000 were lower than the corresponding plate counts. The widest difference is in the 101,000 to 200,000 range, closing to a negligible difference in the 401,000 to 500,000 range. No explanation is offered for this difference other than, possibly, the inability of the technician to judge more accurately how clumps of bacteria will break up during the plating process. As the bacteria count in milk increases, more clumps are observed under the microscope.

As stated under Experimental Procedure, clumps of the same type of bacteria were counted as one. If the clumps showed signs of breaking up, the groups were counted individually. The same procedure was carried out for chains of bacteria.

The difference in the microscopic and plate counts was negligible in the 401,000 to 500,000 range group and this marked the beginning of a reversal—the microscopic count in the 501,000 and up range group becoming higher than the plate count. The reasons for this reversal, in addition to the inability of the technician to judge the break up of clumps, are possibly overcrowding of colonies on high count plates, larger colonies obscuring smaller ones, and diffculty in estimating the count on high count plates.

From the standpoint of meeting the requirements of the Boston Board of

TABLE 4

Grade B Raw Milk in Cans

Microscopic range	101,000	201,000	301,000	401,000	501,000
Average standard plate count	231,000 to 200,000	260,000 to 300,000	369,000 to 400,000	432,000 to 500,000	949,000 up
Number of comparisons	396	239	126	43	81
Average microscopic count	138,000	233,000	333,000	433,000	1,083,000

Health it has been established that microscopic counts ranging from 0-50,000 bacteria per ml. will meet the standard plate count limit of 50,000 bacteria per ml. 91 percent of the time for raw Grade A milk. In order to meet the Grade B limit of 400,000 bacteria per ml. standard plate count, the microscopic count should be no higher than 350,000 bacteria per c.c. This standard holds 89 percent of the time in the range close to the legal limits.

CONCLUSIONS

For all practical purposes the microscopic method of enumerating bacteria in raw milk will give approximately the same results in twenty minutes that the plate method will indicate in forty-eight hours. It will enable laboratory control officials to decide quickly whether the milk will meet requirements, whether the milk is good enough quality to pasteurize and bottle or use for by-products. Further, the results indicate that the microscopic test is accurate enough to eliminate the expensive agar plate method for raw milk in the laboratory routine.

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 dishcloth, 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, and 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.

A Babcock-Test Reading Device

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A very satisfactory and commonly used device to enable the tester to read the fat column in Babcock test bottles is a pair of dividers with sharp points on the end of each arm. In order to use the dividers, it is practically essential that the test bottle be held in the hand. Many persons find it difficult to hold a hot bottle, and also can not manipulate the dividers with ease.

A number of reading devices have been devised but only two of these seem to have attained any wide-spread recognition. The simpler of these devices is the Wagner "Column-Meter." With this instrument, the test bottle is placed on a shelf supported on a stand. The reading is made by moving a pointer and adjusting the shelf until a fixed pointer indicates the zero mark of the bottle graduations. The top pointer then indicates the fat content. The Hortvet "Milk Fat Meter" apparently no longer is being made. With it, the bottle is placed on a stationary shelf, and two pointers fixed to separate movable racks are manipulated to obtain the reading. The Hortvet device has a light placed back of the fat column to enable the reading to be made under constant illumination. This is a desirable feature since different readings may be obtained with the same fat column if the meniscus is read in bright, dull, or other degree of light.

During the last twenty years or so, a number of other devices have been suggested. Some of these are not very practical, others too complicated, and some impossible to use. One instrument, for example, was built on the assumption that all milk test bottles have graduated necks of the same length and diameter. Another device was a combination of levers, pointers, and writing desk.

The instrument to be described was constructed in an endeavor to build one that would not have to be put down and picked up from the work bench every time a test was to be read. Lightness in construction, compactness, and ability to give accurate, reproducible results were necessary features. A number of devices were constructed and the one here described appears best to fulfill these requirements.

It is made of aluminum and brass, and weighs about three and one half ounces. It is fastened to the palm and back of the hand by means of an adjustable clamp into which or from which the hand can be placed or withdrawn. The fingers of the hand are left free. The hand, with apparatus attached, can easily be used to lift bottles from the tempering bath or to place them in a rack. At no time during the reading operation is it necessary to remove the instrument from the hand. It is especially useful when one is troubled by holding hot test bottles.

The construction and method of operation of the apparatus may be understood from an examination of Figures 1 and 2. Figure 3 shows the relative size of the instrument and how it is held to the palm of the hand. The clamp which fastens over the back of the hand is designated by A and B in Figure 1. The adjustment is made by slipping one jaw of the clamp over the other and fastening them together by means of screw C which passes through a slot in the jaws. Housing E serves as a guide for rack F which is moved up or down by means of the gear and pinion housed at G. At H a pointer is clamped firmly to F by means of the set screw K. H may be

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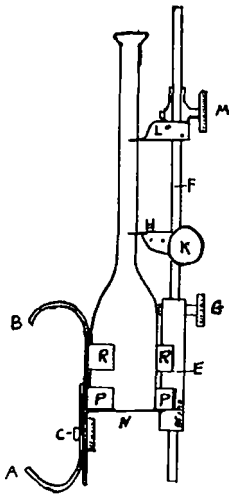

FIGURE 1.

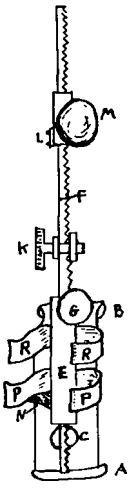

FIGURE 2.

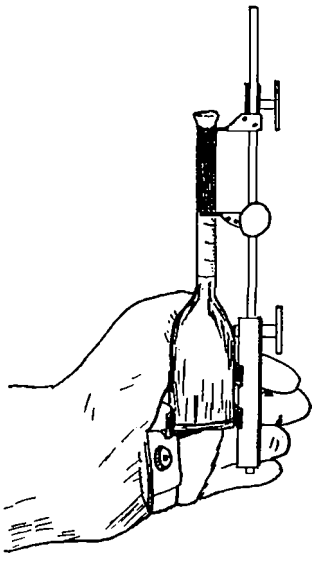

FIGURE 3.

placed at any point on rack F so that pointer H may be used conveniently for either milk or cream test bottles. At L another pointer is movable up or down rack F by means of gear and pinion M. A shelf N is fastened to housing E and to the bottom of the spring clamp P. At R another spring clamp is placed at a convenient height so as to hold securely the test bottle while it is read. The bottle is very easily slipped in and out of the bottle-holding assembly made up of shelf N and clamps P and R.

To use the apparatus, the test bottle is placed in the holder. Rack F is lowered by means of pinion G until pointer H is at the lower meniscus of the fat column. Then pointer L is moved by means of pinion M until it is even with the upper meniscus of the fat column. The pointers are then left in this position and the entire rack F is moved by means of pinion G until H is even with the zero graduation of the bottle. Pointer L then indicates the percentage of fat on the graduation of the bottle.

Acknowledgment with thanks is due to Mr. J. H. Brandon for doing some of the machine work on the instrument.

Technology Takes a Hand in Improved Milk Production

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EFFORTS TO REDUCE PRODUCTION COSTS

The dairy industry has been engaged perseveringly to reduce the cost of milk production. One direction that these efforts have taken has been to increase the size of the dairy farms in order to secure the financial advantage of spreading the overhead over a greater volume of milk.

Then there is the plan of systematically improving the productivity of dairy cows. Dairymen are organized into Dairy Herd Improvement Associations which collaboratively engage the services of trained personnel for determining the quality and quantity of milk produced by each cow, so as to eliminate the unprofitable or "boarder" cows. The beneficial results of this work are clear: in 1939 the association cows produced 7,979 pounds of milk and 323 pounds of milk fat per cow on the average, whereas estimates show that the average of all cows milked in the United States produced only 4,538 pounds of milk and 179 pounds of milk fat per cow. Even this general average has improved: it was only 4,074 in 1924. Each of the association cows consumed only 79 cents worth of feed for every 100 pounds of milk it produced, whereas the average cow consumed $1.06 worth of feed per 100 pounds of milk. In addition, these low-producing cows required as much stall space and almost as many man-hours of work as the association cows. These dairy herd-improvement associations have doubled in number in the last few years.

In addition, there is the new development in the breeding program. Within the last year, approximately 138 selected sires have been artificially "mated" to about 34,000 cows, or nearly 8 times as many as they would have served otherwise.

Mechanical milking was introduced to lower the cost of milking and to improve the quality of the milk. Only the large dairy farms could afford the cost of the necessary machinery, as well as the type of help necessary to operate it.

One of the most recent innovations is the development of a machine for speeding up the milking operations. This is the so-called rotolactor (1)*, first installed at the Walker-Gordon Laboratories, Plainsboro, New Jersey. A new one, operated for display at the World's Fair, has been bought by the United Farmers' Cooperative Creamery of Vermont, Inc., and installed at their Charles River Village plant near Boston—the original Walker-Gordon Laboratory, now being operated as the Walker-Gordon Laboratories of New England. (See Figure 1.) The machine is illustrated in Figures 2 and 3, and the operations are described in some detail in the reference article.

So-called milking parlors are also a recent development for publicizing the degree of sanitation practiced in the milking of cows. This display is usually confined to the production of certified milk. In this operation, the cow is driven to a sanitary stanchion which can be viewed through the plate glass window of a public reception room. The milker stays at the one station and the cows come to him, one after the other.

IMPROVEMENTS IN SANITATION

Even before systematic efforts were inaugurated to reduce the cost of milk

* Briefly, the rotolactor is a rotary milking machine or slow motion merry-go-round—a circular platform with stanchions around the circumference for cows while they are being milked. The animals step on and off the slowly moving platform at the rate of one every 15 seconds. By the time the platform has made almost a complete rotation, the cow has been milked and then steps off.

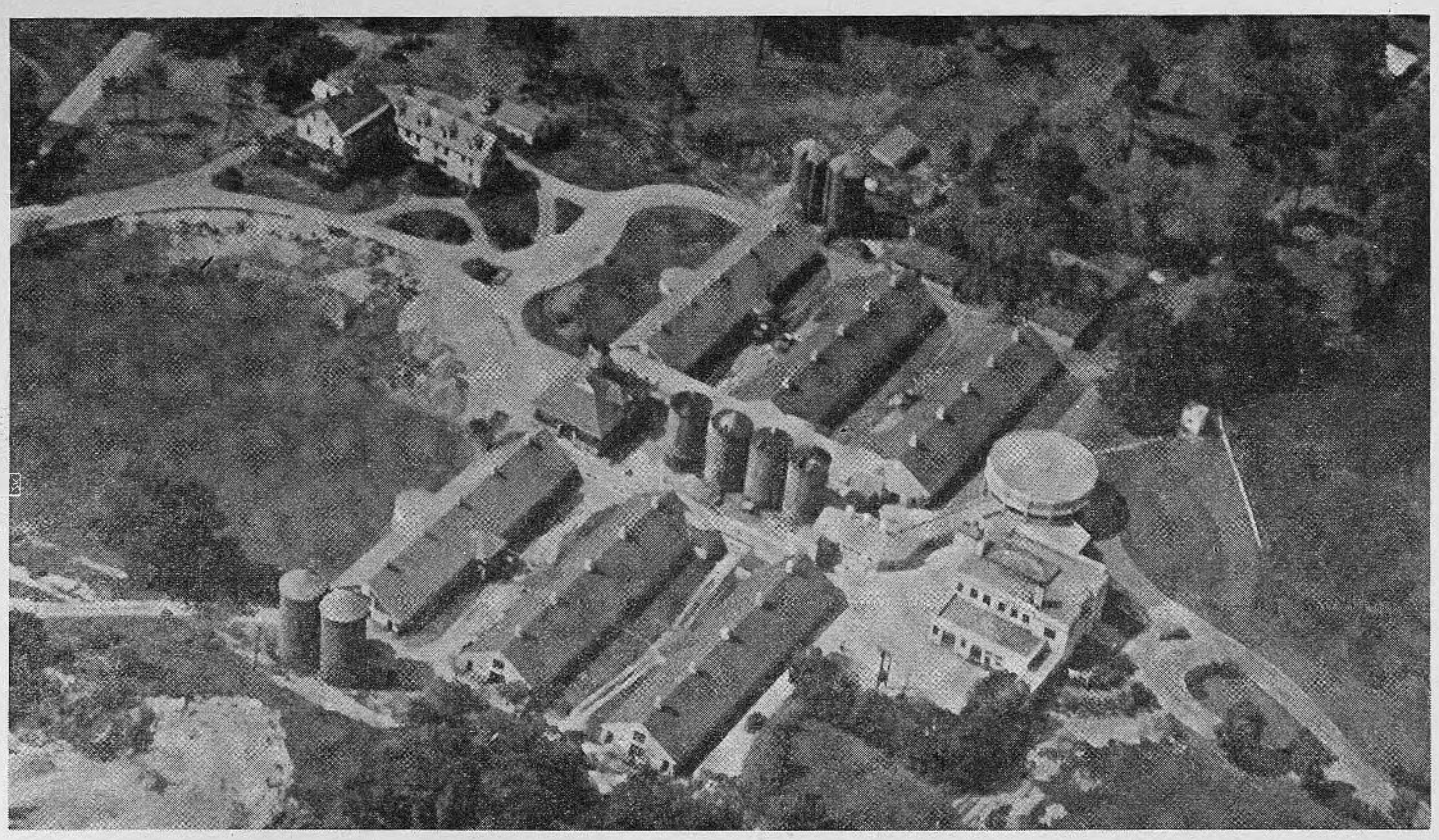

FIGURE 1

Aerial View—Walker-Gordon Laboratories of New England, Inc., Charles River Village, Massachusetts.

production, there had arisen widespread demand for improvement in the sanitary conditions of milking operations. (2)

At first, this demand was more expressive in the elimination of gross adulteration of milk (as, for example, the addition of water and preservatives). Then, as this practice was mostly broken up, regulatory attention was focused on sanitation. Particular laboratory emphasis was directed to the technique of making bacteriological examinations and their interpretation. We passed through the "fashion" of making score cards, and correlations (more or less) of bacteria counts with methylene blue reduction tests. At the present time, the laboratory aspect particularly utilizes the phosphatase test in conjunction with the direct microscopic (Breed) bacteriological count. So we see that the production of milk is becoming increasingly technical. All this costs money. The bill is paid by the consuming market.

Of course, dairy farm inspection has received continuous emphasis. A sick cow cannot usually be detected, let alone located, by examining a bulk milk supply. Neither can a dirty, unsanitary dairy farm be dependably revealed by a bacteriological test of a sample of milk. Inspectors must visit the farms to see what laboratory tests cannot make manifest.

NEW EMPHASIS ON QUALITY

A new emphasis on milk quality is beginning to assert itself. Paradoxical as it may seem, the improvement in milk quality has opened the way to the manifestation of a new phenomenon, namely, the development of off-flavors due to the oxidation of the delicate, somewhat unstable constituents. These organoleptic difficulties militate against milk consumption by curtailing the marketability of such unpalatable milk. The employment of skilled technicians is necessary to detect, correct, and prevent this serious development.

Moreover, the increased recognition of the great importance of adequate nutrition to the public health has directed attention to the dietary quality of milk. As laboratory analytical techniques have been improved, milk has been shown to undergo serious losses of vital constituents. Some vitamins are destroyed by the regular handling operations (3), and

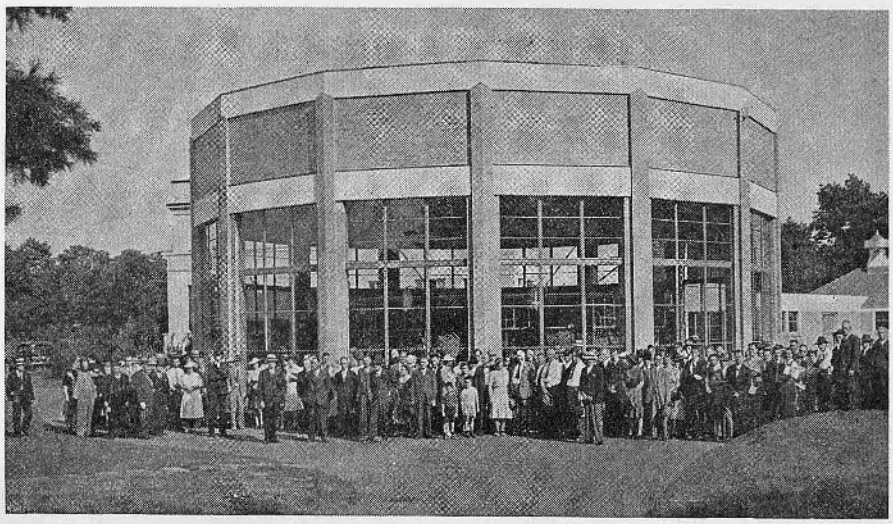

FIGURE 2

Rotolactor—Walker-Gordon Laboratories of New England, Inc., Charles River Village, Massachusetts.

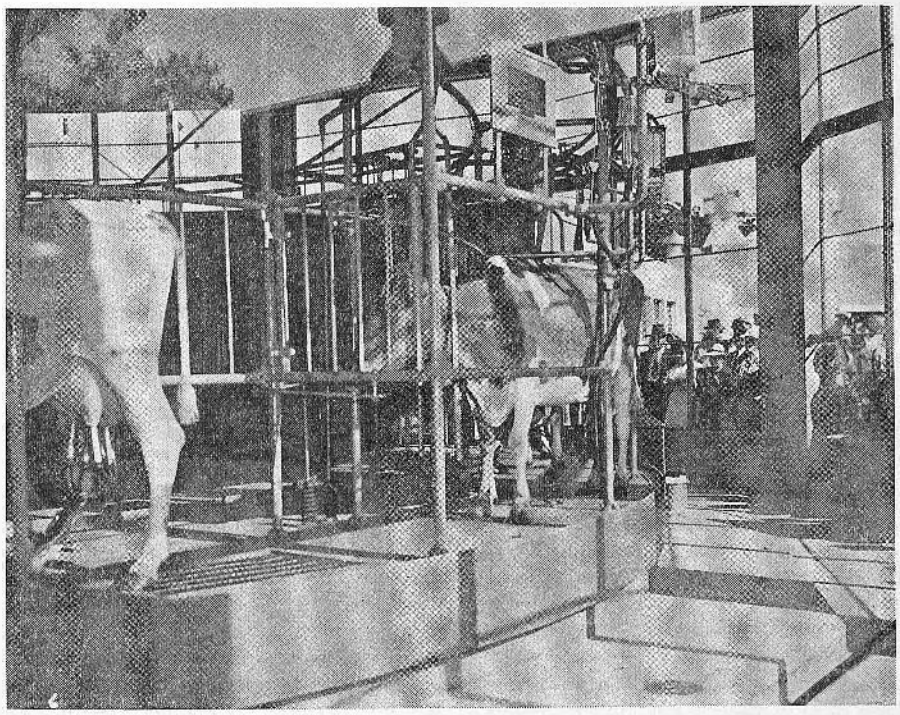

FIGURE 3
Rotolactor Interior.

some vitamins are subject to seasonal fluctuation, and some are produced only when the animals are specially fed or treated. Exposure of milk to oxidation during production leads to development of off-flavor and to loss of the important vitamin C. When the milk is pasteurized, especially after handling through equipment with copper or iron surfaces exposed to the milk, both vitamins C and some constituents of the B complex are lost in varying degree.

The seasonal variation in the feeding regimen has necessitated the use of various food concentrates as well as dried forage crops for the winter feeding of the herds. Added to these are the effects of long stabling during the winter months with attendant deprivation of the beneficial effects to the cows of exposure to the direct rays of the sun. All these factors operate to cause a variation in the nutritive quality of the milk as the seasons come and go. This makes for a reduced food value (in the broader nutritive sense) during the winter months when the consumer needs these vital food constituents the most. A milk of more uniform nutritive quality is needed. On top of this, the whole level of nutritive quality is possible of improvement—provided we could feed the cow the proper ration, and also handle the milk so that the vitamins are not destroyed nor the flavor damaged.

Such desirable objectives have been possible only in the few dairies which specialize in high-quality and high-priced milk—such as certified milk. It has been out of the question to hope that the bulk milk supply could ever attain such nutritive and sanitary quality. The improved technology involved, plus the cost of the better feed, plus the greater sanitary supervision, plus the extra labor and supervisory costs, all taken together impose

a production cost that just cannot be met. And yet the needs of the hour make these demands on the producer. Unless this is done, the industry will suffer loss of position (and markets) by inroads from competing lines.

NEW PRODUCTION DEVELOPMENTS

Several years ago the Walker-Gordon Company instituted the unit operator system at their farm whereby the cows are owned by individuals known as unit operators. One operator may own enough cows to fill one or two barns meaning from 75 to 100 head. He furnished labor to feed the cows and to clean the stables and animals. The company furnishes the feed and labor for milking, and pays approximately three cents per quart for the milk.

When the plant was purchased by the United Farmers, decision was made to build up one unit by bringing together cows owned by individual members of that organization. At present about 150 cows owned by 75 farmers have been brought into production but this number will nearly double. These together with the unit operator-owned cows will mean a total of about 400 or the equivalent of 30 dairy herds. This centralization of production in one plant makes possible a much closer supervision of the production of milk than would be possible under any other condition. Moreover, here the operator can know his costs and is able to substantiate his figures.

A laboratory is maintained to carry on the daily supervision of the milking and handling of the product. Cows are checked by the veterinarian, and their milk is examined in the laboratory before they are allowed to go to the rotolactor. Then daily samples of milk are examined by collecting drip samples from each 18 cows or one-quarter of a barn. These samples are plated and examined. In case one group is abnormal, the individual cows in that group are examined so that the offender can be located and discarded.

A further check is made as the cow enters the rotolactor by having an especially trained man foremilk with a strip cup. In case any flakes are observed the cow is not milked, but returned to the barn for the laboratory man to examine. Before the cow leaves the rotolactor (or table, as it is called), another trained operator completes the milking by massaging the udder while the milking machine is attached. No stripping is done by hand in this case. Thus the milking of 400 cows is done by two men plus a foreman who is available to help either operator as needed. This number of cows on the average farms would mean 30 or more milkers.

By an arrangement of automatic devices, each milker is rinsed, washed, and sterilized after the milking of each cow. Thus, there is practically no opportunity of spreading disease from one cow to another. This means that the milk of most cows are low in bacteria count, which is an added feature in the production of quality milk.

The next and important step in this production of high quality milk is the keeping of milk from the air and the rapid cooling. When the cow is milked, the jar is automatically emptied. The milk is immediately pumped through a closed line, and the cooler, and then into the closed vat. This means that within two minutes after milking, the milk is cooled to approximately 40 degrees Fahrenheit. Thus, this close herd supervision, sterilization of utensils, and rapid cooling insured the daily output of milk from 400 cows with a bacteria count from 1000 to 2000.

The food value of milk is given its share of attention in producing this quality product. The diet of the cows is carefully planned to insure the abundance of health building materials. Succulent roughages are made by the ensiling of both corn and grass plants. The latter is especially preferred for the furnishing of carotene in milk. Dry roughages of different types of hay are carefully selected to insure an abundance of vitamins and mineral. For example, very choice alfalfa is fed which is especially rich in calcium and vitamins A and C. The grain ration is made from a variety

of about a dozen different cereal grains and by-products, with a special fortification of minerals and vitamins. Some of the cows are given irradiated yeast for the production of milk fortified with Vitamin D.

Daily medical supervision checks the health of the employees, so that the milk is protected from direct human infection. One grade of milk—certified milk—is produced here in conformity with the Methods and Standards of A. A. M. M. C. It is under the direct supervision of the Medical Milk Commissions of Boston, Worcester, Springfield, and Providence.

Such a system is capable of more or less indefinite expansion by simply building more unit barns, radiating out of the rotolactor building. Even the rotolactor itself is not absolutely necessary. The above economic advantages are possible even when the milking parlor principle is utilized. In both cases, the cows are driven to the milking unit where all the examining, sampling, cleaning, sterilizing, testing, and other control operations are assembled for direct and effective application. When the limit to the economic advantages attained by such a centralization is reached, other units can be built in neighboring territories.

FUTURE POSSSIBILITIES

It is clear that this plan of assembling the herds of numerous dairymen in one large producing unit enables the industry to meet all the needs outlined above. Already some of these objectives are being attained. For example, three men milk 400 cows where 30 were formerly required—a reduction of 90 per cent of this labor.

Furthermore, all feed is bought in large amounts, with attendant favorable price adjustments. Veterinary supervision can be done more economically where all the herds of a countryside are assembled on one farm. The production of such a relatively large amount of milk enables the management to market the surplus more advantageously, either as whole milk or as dairy products—or even as by-products.

From an improved sanitary standpoint, the potentialities are fully as great. As now generally practiced, laboratory control is expensive, and cannot be maintained by the producer himself. Remote control of dairy farm operations by a distant plant laboratory cannot possibly be as effective as when both the laboratory and veterinary supervision are located right on the farmers' production premises.

The economic advantage of public health supervision is enormously enhanced. Whereas one inspector can cover, say, possibly half a dozen farms in a day, these centralized conditions enable one high-grade man, adequately trained in dairy technology and sanitation, to cover the equivalent of a hundred or more farms. The plant supervisory personnel are right there, so that the inspector can check their control and settle any questions at once without delay, correspondence, and other expense. Moreover, such a procedure is the only one economically and practically feasible for supervising the health of the milk-handling personnel. We all know the impossibility, under our present set-up, of doing an adequate and effective job of insuring that the average dairy farmer (or his farm help) are healthy. By centralization, their healthfulness is assured at only a nominal expense.

In addition, the feeding program for the dairy herds can be regulated to give a nutritive value that does not undergo nearly as much seasonal variation as it now does. Public health necessities demand even a higher nutritive level to milk, say, in the vitamins A, B, C, and D, and minerals, during the winter months than in the summer, and yet just the opposite condition often now prevails. Centralized feeding, under skilled direction makes enhanced and relatively constant nutritive value possible.

Under such conditions as this new development seems to promise, the way is opened for numerous persons, whether farmers or not, to own dairy herds and to have them produce milk more cheaply and superior in quality to the bulk of

the supply as now handled. A new era in milk production is indicated as a possibility.

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"Standard plate counts and presumptive tests for coliform bacteria on 100 samples of home-made ice cream showed logarithmic average plate counts of 171,000 per cubic centimeter and logarithmic average coliform counts of 70 per cubic centimeter. Samples frozen in tub freezers averaged higher than those frozen in mechanical refrigerators, and those made from unpasteurized dairy products averaged much higher than those from pasteurized products. The bacteriological quality of the home-made ice cream averaged lower than that of commercial ice cream (E. S. R., 82, p. 677)."

F. L. MCDONALD.

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"Hygienic control of drinking water is generally done by 2 bacteriological tests—total count and determination of presence of coliform bacteria. Certain chemical tests (NH_3, NO_2, O_2, SH_2) also give some insight on bacteriological activity. So-called total count on gelatin or agar gives incorrect count of all bacteria. Nevertheless, plate method gives dependable picture of aerobic saprophites. Incubation periods of 6 to 8 days give higher counts than only a 48-hour period, although liquefaction of gelatin is an obstacle. Agar gives lower counts than gelatin, but shows organisms of fecal origin more clearly. Direct microscopic count gives all organisms, even dead ones. Coliform test determines only certain physiological group. German methods try not only to show presence of coliform organisms but also to get approximate count of them, either by using different dilutions in liquid media or by direct plating on Endo agar. As incubation at 37° C. also gives coliform organisms from cold-blooded animals, method by Eijkman (incubation at 46° C.) is considered of more hygienic value, being specific for thermophilic gas formers. Often important is the determination of bacterial activity by measuring chemical changes caused by bacteria, either by putting isolated bacteria in favorable media or by more natural method of putting chemical food to large water sample. Method also allows study of certain influences, as temperature, O_2 content, and effect of poisons. Chemical analysis can give chemical activity directly in water course. Interpretation of results from bacteriological standpoint, however, requires care in differentiating biological and purely chemical causes of changes observed."

H. B. FOOTE.

Interstate Trade Barriers *

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INTERSTATE TRADE BARRIERS

There is nothing new or strange about the subject ot trade barriers. It is a problem we have constantly before us in our dealings with foreign countries. It has been said to be one of the reasons why it has been so easy for Mr. Hitler to walk through Europe. Certainly it is a subject of the most vital importance in our own dealings with Mr. Hitler.

We in this country have been most fortunate in the high levels of consumption and production we have achieved and have thus far been able to maintain. This has been the result of no accident. In the first place it was due to the fact that within our own borders we had a wealth of raw materials—the natural resources essential to efficient farming and manufacturing. Then we have devoloped an extremely efficient industrial system through the application of science and technology to those resources. Finally our Constitution gave us a set of legal institutions which did not prevent or restrict technological changes and economic development. We had in fact within the borders of these United States the greatest free country and free market in the world.

This means that we developed a high degree of regional specialization from which everybody benefited. Because they could produce shoes and textiles better and cheaper in New England at that time than anywhere else in the country, all the people benefited by being able to buy cheaper New England textiles and shoes. When later some of these could be produced better in the South and West, we could buy them from there just as easily as we had formerly bought them from New England. We got our steel from Pittsburgh, our wheat from the Mississippi Valley and our lumber from the Pacific Northwest. We got them from those places because there they could be produced cheaper and better than anywhere else.

And because we were able to produce so efficiently and economically we were able to produce and *consume* a greater volume per capita for our population than any other country in the world. We enjoyed this because we had the *freedom* to produce and the *freedom* to consume.

EFFECT OF TRADE BARRIERS IN EUROPE

Now let us look for a moment at a part of the world where this freedom did not exist. And let us see whether or not there is any truth in the statement that the staggering success achieved by Hitler and his hordes is largely due to the restrictions put upon free trade by the countries he conquered.

Before the last World War the peoples of Central Europe now under Hitler's heel were relatively prosperous. They enjoyed a fairly well-balanced economy. After the peace, however, they ceased to cooperate and each little country followed economic policies which broke down the economic unity and prosperity of Central Europe. And it was this disunity and the economic breakdown which accompanied it which made these states the easy victims for dictatorship which they turned out to be.

Every country wanted to become self-sufficient and yet capture as much of the outside trade as possible. So they not only set up tariffs and trade quotas, custom houses and immigration laws, but

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* Delivered before the New York State Association of Milk Sanitarians, Buffalo, New York, September 25, 1941.

they prohibited gold exports, blocked currencies, went in for barter trading and finally succeeded in "protecting" their home industries so well that only the guns of another war could break down the barriers these nations had set up.

In any country or section of a country, when you try to produce goods or provide services which can be produced or provided more readily in other sections or by other means, you can only do so with the result that a given investment of capital and labor produces a smaller volume of consumable goods. This means in the end a weakened economy, and a lowered standard of living all around. For living standards can only be high when goods are abundant and cheap—not when they are scarce and dear.

TRADE BARRIERS IN OUR EARLY DAYS

Our own country had the same experience in its early days. After the Revolutionary War but before the adoption of our Constitution, the states retained the power to regulate and restrain interstate commerce under the Articles of Confederation. The result was that the thirteen states waged a relentless trade war upon one another. New York locked out the products of New Jersey and Connecticut. Pennsylvania refused to send its anthracite coal to New England where new industries were just getting under way. New England retaliated by boycotting products from Pennsylvania.

The result was not only that business was strangled, and that people were impoverished, but that the states were brought to the verge of military as well as economic warfare. Only the Constitutional Convention which first met in Philadelphia in 1787 saved the day.

Our Constitution, which was finally ratified in 1789, was largely brought about by the need of abolishing interstate trade barriers as well as safeguarding foreign commerce. The Commerce Clause of our Constitution, drawn up for that express purpose, reads:

"Congress shall have power 'To regulate commerce with the foreign nations, and among the several states and with the Indian Tribes'."

In view of this clause in our Constitution giving Congress plenary power to regulate interstate commerce you may wonder how such a problem can arise today.

PRESENT TYPES OF TRADE BARRIERS

In order to make this clear, let us see just what we mean by a trade barrier. A trade barrier has been most accurately described as: "A statute, regulation or practice which operates or tends to operate to the *disadvantage* of persons, products or services coming from sister states to the *advantage* of local residents, products or enterprises." There are other definitions but the main point to get clear is that *unfair discrimination* against non-local enterprise is the keynote of all definitions.

How do they come about? First there are laws which are passed by state legislatures that are deliberately aimed at excluding non-local enterprise. Such was the North Carolina law which required any merchant not "a regular retail" merchant in the State" to apply for a state license and pay an annual tax of $250 for the privilege of displaying his "samples, goods, wares or merchandise." This statute was declared invalid by the unanimous decision of the U. S. Supreme Court. Laws like this are generally passed through the efforts of pressure groups in the state legislatures and can be dealt with either in the courts or through legislative action.

Then there are laws which are not discriminatory in appearance but which turn out to be so in practice. Such is the California law which "establishes minimum standards of grades and containers for specified fruits and vegetables. Unlawful to ship or sell non-conforming goods: inspection fee to be paid by owner." As a matter of fact virtually any law can be so administered as to discriminate in favor of certain enterprises and against others—generally outside the state—particularly if the administrative agencies enjoy discretionary authority in framing rules and orders under a given statute.

Finally there are laws which act as trade barriers because of their cumula-

tive effect. Laws having the same purpose but differing in details from state to state or differing enough in administration to impose a direct and disproportionate burden on interstate commerce. Such are the laws imposing different or even conflicting regulations on trucks—sometimes even by cities and counties within the state—or the fact that the standard measures for containers vary widely from state to state. These laws are constitutional in themselves but it is becoming ever more apparent that Congress may soon pass national laws superseding this body of non-uniform state laws to remove barriers of this type. We have seen it has the power to do so under the Constitution.

But to understand how trade barriers work it is best to see them in action. A number of studies have been made, the best so far being a Special Report by the Bureau of Agricultural Economics, and the Marketing Laws Survey by the Works Projects Administration. Another excellent source is the transcript of evidence before the Temporary National Economic Committee.

Trade barriers have been classified under the following headings:

Dairy products; oleomargarine; alcoholic beverages; railroad and motor vehicle regulation; merchant truckers; grades, standards and labeling; quarantines; livestock, eggs and general foods; state use taxes; and geenral preference laws.

The WPA study lists approximately 1,500 laws and regulations that create or tend to create barriers to interstate commerce.

Consider for example what happens when a producer wants to ship fruit or vegetables out of his state.

From the standpoint of weight, if he wants to sell a bushel of apples, 9 states require a bushel to weigh 50 pounds; 17 states, 48 pounds; one state, 47 pounds; 4 states, 45 pounds; and 2 states, 44 pounds. The remaining 15 states do not fix the weight at all. That is to say there are 33 variations set by states aside from those states that fix no weights. If he were shipping onions he would be faced with 38 variations and 6 classes of weights.

As already noted, the Federal Government has set up certain standards of weight, grading, packaging and labeling for various fruits and vegetables, but it has not gone far enough in this field or in regulating sizes of containers. As a result we have a situation where cantaloupe crates in 15 sizes and apple boxes in 7 sizes are in use in interstate commerce.

It scarcely seems necessary to emphasize the fact that such an anomalous situation puts an intolerable burden on interstate commerce and that it should not continue to exist.

Another striking trade barrier example is found in various state laws affecting the sale of oleomargarine. No one advocates that merchants should be permitted to defraud the public by selling oleomargarine as butter. On the other hand now that margarine has vitamin A added to it and is manufactured under a Standard of Identity promulgated under the Food, Drugs, and Cosmetics Act and enforced by the Federal Security Agency, there is little, if any, merit left in the argument that it is not as healthful and nutritious as butter. In fact it is generally admitted that taxes on margarine are levied to protect the dairy industry from competition. It is well known that such taxes produce practically no revenue. Some states exempt oleomargarine from special forms of taxation provided it contains domestically produced fats and oils. The question nets down to just how far we are justified in subsidizing one industry at the expense of consumers who cannot afford to pay for other more expensive table fats. Oleomargarine taxes are barriers to free interstate trade. It is just a question of who needs to be protected most, and who in the long run "pays the piper."

REMEDIAL EFFORTS

The Interstate Commerce Commission in a recent report to Congress (entitled Ex Parte No. MC-15 and made after exhaustive study) has recommended that it be given power upon complaint and

hearing to take action to eliminate the trade barrier effects of any given state law. H. R. 4785, introduced shortly after the President declared a state of emergency to exist, and which will provide the Commision with essentially this power, is now before Congress.

State governments likewise aware of this serious threat to the defense program, are making some progress towards a solution by negotiating reciprocal agreements with respect to the movement of motor trucks among the various states.

Now we come to the problem of state milk inspection. It is scarcely necessary to tell you that there can be no valid objection to inspections needed to stamp out tuberculosis, typhoid, and other milk-borne diseases which may easily be spread through the distribution of milk from unsanitary dairies.

On the other hand, it is also probably not unknown to you that there have been states which have made use of their dairy inspection laws to exclude milk from neighboring states in order to protect and reserve local markets for local producers. In these cases inspection laws designed primarily for honest uses are put to dishonest uses not in the public interest.

Again the question resolves itself into a choice between allowing some temporary loss of profits to local enterprise by virtue of having to meet non-local competition as against the much more serious consequence of keeping the price of an essential article of diet beyond the reach of a considerable portion of the population.

This also is a problem which directly affects our defense effort. The potential low income market of the United States includes approximately 29 million families and 10 million single persons making a total of approximately 126 million persons. Almost two thirds of these families are estimated to have incomes under $1,500 annually, the average for this group being $826 or $69 per month. Obviously families in this income range cannot pay high prices for dairy products. The government has become keenly conscious of the importance of keeping our people well-fed, if we are to come out ahead in the difficult times we face. Conditions of physical fitness brought to light by the Selective Service Act gave us an unpleasant reminder that there are large numbers of people unfit for active military duty because of undernourishment. Of all the charity appeals that have been made, none has been more poignant or more powerful than the demand for milk for babies.

These are some of the forces that are at work in the minds of the people and of government officials today. It has never been the purpose or desire of the Interdepartmental Committee on Interstate Trade Barriers to advise federal regulation at the expense of any degree of state sovereignty. The Committee has worked consistently through the Council of State Governments to eliminate trade barriers through consultation and adjustment of burdensome state laws by the legislators and administrators of the states involved. Very real progress has been made in this direction. No sweeping regulatory laws will be imposed by Congress in this field unless there is no alternative.

UNIFORMITY OF MILK INSPECTION NEEDED

But the science on which your profession is founded has in common with all science, the characteristics of consistency, clarity, and uniformity. The scientific principles which you employ in protecting the milk supply of the people of New York are no different than those used in Ohio or Pennsylvania. The laws which are necessary and sufficient in one state should with all necessary allowances for climate, distance, or other variable factors be sufficient and necessary for the same purpose in every other state. Inspection there must be. But inspection for only one purpose. That is, for protection of the public health against milk-borne disease.

When the inspection laws are used, as unfortunately they have been in a number of instances, to protect local markets against non-local competition, they become a trade barrier and as such must be removed. If they are removed by free

agreement reached between individual state governments, we shall have preserved state sovereignty to a greater extent than had such action been by broad regulatory law imposed by the Federal Government.

In professional groups disagreements regarding refinements and interpretations of theories will often be found. I have no doubt that this group cannot always see eye to eye with all views propounded by similar groups in other states but on one point I think we must all agree. That is that milk inspection must be maintained at the high level of efficiency which is necessary to protect public health but at the same time that markets must be opened to producers whose sanitary standards equal or exceed those of the receiving market. Duplicate and overlapping inspections are costly and tend to raise consumer prices. They should be eliminated and should be replaced by greater uniformity in state inspection laws and by greater reciprocity among the states and market areas in this field.

There is probably no group of men in the country who could exert a greater influence in this direction. It is for this reason that we have felt it quite important to discuss the trade barrier problem with you. We want to urge you to exert your influence to bring about inspection procedures and agreements which will make it possible for dairy products from low-cost producing areas to have free competitive access to the great markets of America.

Brucellosis *
A Disease With Many Names

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What is in a name? A rose by any other name would smell as sweet. Also, a disease by any other name would be just as severe. A man may assume other names to conceal his past history. Different names assigned to a disease may refer to geographic location, variation in symptoms, or a stage in the development of knowledge. These factors account for the origin of many names formerly given the disease now known as Brucellosis.

Other Names for Brucellosis. A partial list of the names assigned to this disease would include: goat fever, dust fever, intermittent typhoid, pseudotyphoid, recurrent typhoid, typhomalarial fever, fecomalarial fever, subcontinuous fever, Mediterranean gastric remittent fever, bilious remittent fever, remittent fever, febrile dyspepsia, recurrent fever, Rock fever, Gibralter or Malta or Constantinople or Mediterranean or Neapolitan or Cyprus or Levant or Cretan or Syriac fever, sewage or mephitic or cess-pit fever, and new fever. The disease may be "new" to some people, but nearly twenty-four hundred years ago Hippocrates, a Greek physician, gave descriptions of fevers which tally rather closely with that of Brucellosis as we know it today. For two centuries or more an increasing number of medical writers have been describing a disease which we now suspect was Brucellosis. In America such descriptions go back to Civil War days or beyond, and we now wonder how many of the cases formerly called typhomalarial fever actually may have been Brucellosis.

Undulant Fever. In 1897, Hughes suggested calling the disease "undulant fever" because the fever often occurs in waves. This name appeared quite appropriate and descriptive of a common form of the disease and gradually came into general use. In recent years it has been found that the name does not fit the chronic form of the disease which may exist without fever. Thus, writers have begun to use the name Brucellosis to include all forms of the disease, and class the cases as acute and chronic. This term deservedly honors Bruce for the additions he made to our knowledge of the disease.

THE CAUSE OF BRUCELLOSIS

In 1886 Bruce discovered the cause of the disease in man. In 1897 Bang discovered the cause of contagious abortion in cattle. Bruce saw the round form of the germ and called it a micrococcus. Bang saw the rod-shaped form and called it a bacillus. For more than twenty years these were thought to be two different germs. It fell to the lot of an American bacteriologist, Miss Alice Evans, working in a government laboratory in Washington, to prove that they are merely different strains or types of the same germ. Her first announcement made in 1918 has been confirmed by many other bacteriologists and is now an accepted fact.

Types of Brucella. The germ is given the generic name *"Brucella"* in honor of Bruce who first discovered it, and there are three strains which may be listed as follows:

1. *Brucella melitensis* is the strain usually found in goats and sheep.
2. *Brucella suis* is the strain usually found in hogs.
3. *Brucella abortus* is the strain usually found in cattle.

* Reprinted by permission from the monthly bulletin of the Connecticut State Department of Health for September, 1941.

While the three classes of animals mentioned are those usually infected, other animals may also carry the infection. It is especially worthy of note that while the usual strain found in cattle is *Brucella abortus,* cattle may also become infected with *Brucella melitensis,* or *Brucella suis.* This is an important point to remember.

Man Susceptible to All Types. Any one of the three types of Brucella may cause disease in man. However, there is a marked difference in severity of symptoms resulting from infection with the different types. Infection with *Brucella melitensis* causes the most severe attacks of the disease with the highest fatality rate. The next most severe is infection with *Brucella suis.* When the strain of germ causing the infection is *Brucella abortus,* the symptoms are apt to be less severe and the fatality rate much less. However, many cases of infection with *Brucella abortus* become chronic cases and disability may continue over a period of years.

Sources of Infection for Man. The ordinary communicable diseases of man are spread from one person to another. Not so with Brucellosis. Man contracts this disease from animals. He may contract the disease either by contact with infected animals or by consuming raw milk from them. Contact with infected animals may occur on the farm where they are raised or in the slaughter house where they are processed for meat. In this part of the country, infection usually results from drinking raw milk produced by infected cows. The germs grow in the udders of cows and are given off with the milk. Often the cows have no symptoms of disease and thus merely serve as "carriers" of the germ which is conveyed to man through milk.

Methods of Prevention. Man can protect himself from Brucellosis by relatively simple methods. These methods are avoiding contact with infected animals, and *insisting that all milk consumed be pasteurized* unless it comes from Bang's free cows. The process of pasteurization kills the germs that cause Brucellosis. It also kills the germs that cause other milk-borne diseases, and thus provides additional protection to the consumer. However, persons in contact with infected cows may contract Brucellosis even though the milk is pasteurized for the protection of consumers. It happens that the germ of this disease can enter the body through the skin of a person who comes in contact with it and for that reason a person who handles infected cows or handles meat from infected animals may become infected without eating any of the material or drinking any of the milk containing the germs.

BRUCELLOSIS IN CONNECTICUT

The part played by Connecticut in the development of our knowledge concerning Brucellosis may be of interest. In 1917 DeForest published an article on the probable relation of contagious abortion in cattle to abortion in women. His presumption was based on some very interesting and apparently significant epidemiological observations, some of which were made in Connecticut, but he was not able to prove it by finding the germ. Ten years later, other workers did find *Brucella abortus* in a human fetus. In the meantime interest had been aroused in that form of Brucellosis then called Malta fever or undulant fever. In 1924 a case of Brucellosis was recognized in Connecticut and the germ was found in the patient's blood. This was the third case recognized in this country outside of the southwest where a number of cases had occurred among people in contact with goats. The Connecticut case had no contact with goats and the strain of germ was found to be *Brucella suis.* The patient worked in a slaughter house and handled pork. A detailed account of this case was published in the annual report of the Connecticut State Department of Health for 1925 under the heading "Malta Fever." A Connecticut physician, Dr. Harold L. Amoss of Greenwich, Connecticut, while working in Baltimore nearly twenty years ago, discovered the first case of Brucellosis recognized in this country outside of the southwest.

Further interest in the Brucellosis

TABLE 1

Human Cases of Brucellosis Reported in Connecticut

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1928				Made reportable Aug. 14				2	1	—	1	—	4
1929	—	1	—	1	2	—	2	1	3	1	2	—	13
1930	4	—	—	1	1	2	1	—	—	1	2	9	21
1931	2	2	2	3	2	1	2	1	—	—	3	2	20
1932	2	3	3	1	1	8	2	3	—	1	8	1	33
1933	4	4	4	2	1	2	—	4	5	4	5	1	36
1934	3	2	1	5	7	7	3	1	3	8	8	7	55
1935	4	3	2	5	2	3	4	7	2	6	13	8	59
1936	4	6	7	6	6	12	17	6	7	11	8	8	98
1937	8	2	3	8	9	3	6	10	9	5	4	7	74
1938	6	5	10	8	13	9	3	3	6	8	15	11	97
1939	5	6	6	5	4	11	5	5	5	8	4	6	70
1940	3	3	1	5	5	6	15	10	5	9	9	20	91
1941	13	7	3	14	17	10	15	8					

problem was aroused by a cooperative study started in 1926 and participated in by the Bureau of Laboratories of the State Department of Health and the laboratory of the State University at Storrs, in which more than 20,000 specimens of blood from humans were examined for evidence of Brucella infection. The agglutination test was used in this study and the results were reported to the physicians who had submitted the specimens of blood for other examinations. This served to draw attention of physicians to the possibility that some cases of indefinite illness may be Brucellosis. The disease was made reportable in 1928 and Table 1 shows the number of cases reported by months since that time.

This table shows a marked increase in the number of cases reported since the disease was made reportable. It is suspected that a large part of this increase may have been due to better recognition of cases. This increase in number of recognized cases during a period of increase in protective measures, like pasteurization of milk and the elimination of Bang's disease from dairy herds, serves to emphasize the importance of Brucellosis as a health problem. As 87 cases were reported for the first eight months of 1941, the total for the year may be expected to reach a record high.

During the period, 1928 to 1940, inclusive a total of 671 cases and 9 deaths from Brucellosis were reported in Connecticut. If the numbers involved in one outbreak of 14 cases with 3 deaths due to the *Brucella suis* type of germ be deducted from these totals, the remaining 6 deaths among 657 cases would make the fatality rate a fraction less than one per cent, which is about what might be expected with infection from the *Brucella abortus* type of germ.

THE CONNECTICUT PLAN FOR COMBATTING BRUCELLOSIS

After a careful study of the problem, which included some experimental work to establish practical methods of procedure, a rather definite plan has been developed for dealing with the Brucellosis problem in Connecticut. This plan may be summarized as follows:

1. *Investigation of Cases.* Each case of Brucellosis reported is investigated from an epidemiological point of view to determine the possible sources of infection. At first all such investigations were made by representatives of the State Department of Health. In recent years, some of the local health officers have carried out investigations in their respective jurisdictions.

2. *Reference to Dairy and Food Commissioner.* In this section of the country practically all cases of Brucellosis get the germ by drinking raw milk from infected cows. Accordingly, if the investigation shows that the patient has been drinking raw milk from a herd not accredited as free from Bang's disease, and no other source of infection can be

found, the case is referred to the Dairy and Food Commissioner adjudging milk from that supply as deleterious to health under section 2484 of the General Statutes. It is considered also that the milk will cease to be deleterious to health if the dairyman does one of two things: eliminates Bang's disease from his herd so the herd may be accredited as Bang's free by the Commissioner on Domestic Animals, or pasteurizes his milk.

3. *Hearing by Dairy and Food Commissioner.* On the basis of this finding, it is the practice of the Dairy and Food Commissioner to call the dairyman in for a hearing and the situation is explained to him in detail. If the dairyman is undecided about the procedure to follow, he is given an opportunity to have a survey test of the herd made without cost to himself as a basis for determining policy. Usually the dairyman avails himself of the opportunity to have the survey test made before deciding definitely on a policy to be pursued. In that case the matter is referred to the Commissioner on Domestic Animals for making the test. Funds now available to pay indemnity for infected animals that are slaughtered give dairymen a greater incentive to cooperate with the government plan for eliminating Bang's disease from their herds. The elimination of infected animals has the advantage for the dairyman that it removes the hazard of infection by contact with the cows. Pasteurization protects the milk consumer but it does not protect those who come in contact with infected animals that are left in the herd.

4. *Reinvestigation.* It is made clear at the hearing that a further investigation of the case will be made if there is any question as to the validity of the information then available. If the dairyman presents information in regard to other possible sources of infection for the patient, a reinvestigation is made, and only in a case or two has it been necessary to rescind the adjudgment of a milk supply being deleterious to health. Occasionally the patient may forget some occurrence, or rarely may attempt to conceal some other possible source of infection. In most cases reinvestigated the information gained does not warrant a change in judgment as to the milk being deleterious to health. The response of the dairymen has been most gratifying. They want to do what is right when facts are explained to them. In only a case or two has it been necessary for the dairy commissioner to issue an order stopping the sale of milk in order to get their cooperation.

5. *In Case of Suspicion.* Sometimes an investigation shows that most of the patient's milk supply during the incubation period of the disease came from one source, but a supplementary supply from another source occasionally used could not be excluded as a possible source of infection. In such cases it is considered that the most probable source of infection was the milk supply used in largest quantity. Accordingly, the practice has been developed recently of notifying the dairyman that his milk supply has been brought under suspicion and inviting him in to discuss the matter. It is considered that the dairyman is entitled to information in regard to such suspicion of his milk supply. When the situation is explained to him, he usually proceeds to have it cleared up, either by eliminating Bang's disease from his herd or by pasteurizing his milk.

6. *The Family Cow.* In some instances, the family cow has supplied the only milk used by the patient during the incubation period. In case of such a finding, the matter is explained to the family in detail and they are glad to have the cow tested in order to remove the hazard. Under such conditions the matter is referred directly to the Commissioner on Domestic Animals since the Dairy and Food Commissioner would not have jurisdiction unless the milk is sold. This procedure has resulted in having a number of cows tested and destroyed.

7. *A Few Special Cases.* Usually only a case or two of Brucellosis develops among users of milk from an infected supply. In one instance, however, a large supply of milk was adjudged deleterious to health and the dairyman de-

cided to put in a pasteurization plant. Before he got the plant installed to make his milk safe, three other cases were investigated and traced to the same milk supply, making a total of 4 cases traced to one milk supply. In another instance, by the time the dairyman came in for a hearing a total of 5 cases of Brucellosis had been traced to his supply. In that case he was not given time to consider the policy to be pursued, but was required to begin pasteurization the next morning. Another dairyman put in a pasteurization plant when his milk was adjudged deleterious to health, and all was well till a flood interrupted the operation of his plant and he sold raw milk for a few days. As a result one of his customers developed Brucellosis. In some instances of possible doubt concerning the source of infection for one case, the development of another case among users of the same supply furnishes convincing evidence. Two cases in one family were infected by milk from the family cow, one of the cases was so mild that it probably would not have been recognized if there had not been a severe case in the same family of six. Blood from two other members of the same family gave strong reactions for Brucellosis, but there were no symptoms of illness. Another patient visited a relative in the country and contracted Brucellosis by eating ice cream made from milk produced by the family cow. The cow was tested and found to be infected. Freezing did not kill the germs.

8. *Results Achieved.* The ends accomplished by carrying out this plan may be briefly summarized as follows:

1. A large number of pasteurization plants have been installed. Pasteurization protects the milk consumer against other milk-borne diseases in addition to Brucellosis.
2. Many herds have been tested for Bang's disease, and a large number have continued the tests so as to be accredited as Bang's free herds. This protects those who come in contact with the cows as well as the milk consumers.
3. A number of infected family cows have been discovered and destroyed, thus removing hazards to the families and persons who visit them.
4. Perhaps the most important result in relation to the future is the growing appreciation of the importance of the Brucellosis problem, and an increasing willingness on the part of dairymen to carry out protective measures.

FINANCIAL RESPONSIBILITY OF DAIRYMEN

It is highly important that all dairymen, whether producers or dealers, realize that they can be held financially responsible for cases of Brucellosis resulting from the consumption of their milk. This is on the basis of the well-recognized principle of common law that the sale of a food product carries an implied warranty of its safety. In other words when a dairyman sells milk the act of selling is interpreted as warranting its safety. If the milk causes disease in the consumer, the dairyman can be held financially responsible. It is not necessary to prove negligence in such cases. The fact that the sale of a food ready for immediate consumption carries an implied warranty of its safety is sufficient ground for action against the producer, the wholesaler, the retailer or anyone else concerned with the sale or distribution of a food that causes disease. In addition to this definite financial responsibility there is a hazard of loss of business if word goes out that the milk is responsible for disease. On various occasions dairymen have suffered serious losses in sales, and even have been forced into bankruptcy, by rumors of their milk supply being responsible for outbreaks of disease. This has occurred in instances where the rumors could not be substantiated or where the evidence might not warrant holding the dairyman responsible for damages caused by the disease.

However, in other instances, where evidence has warranted such action, the courts have assessed damages against dairymen selling milk which caused di-

sease. For example, on April 15, 1937, the Superior Court of the State of Washington awarded damages of $1,947.50 to a patient who contracted Brucellosis from the use of raw milk. On August 30, 1940, the Supreme Court of Washington affirmed a judgment awarding damages of $7,500 to another patient who contracted Brucellosis from milk. In other cases, both in this country and abroad, damages have been awarded to victims of Brucellosis and other diseases due to milk. In Connecticut a Brucellosis patient brought action in court and the case was settled out of court by the dairyman agreeing to pay $3,750 damages to the patient. It is quite obvious that the dairyman realized his responsibility in this case.

SUMMARY AND CONCLUSIONS

For reasons given it seems desirable to use the name Brucellosis to designate the disease formerly known by many names including undulant fever. It is now recognized that the disease constitutes an important health problem in Connecticut. The fact that more cases are being reported serves to emphasize its importance, whether the greater number results from better recognition of cases or an actual increase in prevalence. Our present knowledge of the disease amply warrants the following conclusions:

1. Man contracts Brucellosis by drinking raw milk from infected cows, or by contact with infected animals or their meat. In Connecticut nearly all cases are due to drinking raw milk.
2. Milk drinkers can be protected by pasteurizing the milk or by eradicating Bang's disease from the dairy herd. The germ that causes Brucellosis in man is the same germ that causes Bang's disease or contagious abortion in cows.
3. The Connecticut plan for combatting Brucellosis has been designed to remove specific hazards to milk consumers when found as a result of investigating cases. The ideal plan would be to remove all potential hazards to milk consumers by pasteurizing all milk unless it comes from accredited Bang's free herds.
4. It is a well-recognized principle of law that the sale of a food product such as milk carries an implied warranty of its safety. If it causes disease in the consumer, all persons concerned with its production, distribution and sale can be held financially responsible for damages resulting from the illness.
5. Dairymen can insure against financial responsibility for Brucellosis cases among their customers by pasteurizing their milk or eliminating Bang's disease from their herds. The latter procedure will also protect dairymen and their employees from the hazard of contracting the disease by contact with infected animals.

The Relief Milk Program

Fred L. Shipley
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The Relief Milk Program developed during the past two years is one of four types of programs carried on by the Surplus Marketing Administration. The other three programs are the direct purchase and distribution, the food stamp plan, and the school milk program. Under all of these programs, surplus dairy products are purchased from the wholesale market and distributed through relief agencies to needy families.

These programs make it possible for some twenty million persons to improve their diets. The relief milk is only part of the general picture.

Essentially the relief milk programs were designed, the same as all the other programs, to bring about higher returns to agricultural producers, but of equal importance is that they were aimed to increase the consumption of milk for needy families unable to buy sufficient quantities at prevailing retail prices.

These relief milk programs are operated by the Dairy Division of the Surplus Marketing Administration by authority of Public Act No. 320, Seventy-Fourth Congress, approved August 1935.

An amendment to Section 32 of that Act, approved June 1939, placed with the Secretary of Agriculture the broad power to encourage the domestic consumption of agricultural commodities with particular regard to low-income groups. This, to quote directly from the amendment, was to be done "by increasing their utilization through benefits, indemnities, donations or by other means."

The Secretary also was given the right of determining the persons in the low-income group to whom the benefits of the relief milk programs were to be extended.

The first of the relief milk programs was put into operation in the Boston milk marketing area in August 1939. Since then, the programs were extended to Chicago in November 1939; to New Orleans in May 1940; to Washington, D. C. in August 1940; to New York City in December 1940; and to St. Louis on March 31, 1941.

The terms of the St. Louis program are clearly set forth in agreements between the Secretary of Agriculture and the Social Security Commission and in contracts between the Secretary and handlers of milk. Some of the more important provisions of these agreements and contracts are:

1) Provides that participation by the relief client be voluntary.
2) Defines those eligible to participate in the program.
3) Specifies the quantity which each client may receive.
4) States how the milk is to be delivered; whether it is to home or station or both.
5) Provides that the milk must be of regular grade and quality.
6) Stipulates the price to be paid for the milk, the handlers' margin, and payments to be made by the Secretary of Agriculture.

In general, these provisions apply also to other cities where the programs are in effect. However, the method of delivery of the milk—that is, whether it is to be distributed through stores, stations, or delivered to the homes—and the requirements as to eligibility as well as the amount of milk available vary with the different localities. This is also true of the cost of the milk to the relief client and the price paid producers by contracting handlers.

In St. Louis, persons eligible to participate in the 5 cent per quart relief milk program are those persons and families

receiving public assistance from the Social Security Commission in the form of general relief, old age assistance and aid to dependent children.

In St. Louis each child under 17 and each expectant or nursing mother may receive up to 1 quart of milk per day and one pint is allowed for each additional adult. In St. Louis all of the milk is delivered to homes. Chicago is the only other city which has home delivery and there, only part of the milk is delivered to the home while the balance is distributed through stations set up and operated either by the W.P.A. or the relief agency.

The price to the relief client is considerably below the prevailing resale price. In March 1941, milk for home delivery in St. Louis was 13 cents per quart. Thus the relief recipients save 8 cents on each quart and besides, have the milk delivered directly to their homes.

In St. Louis the producers receive 1 cent per quart less for the milk sold under the relief milk program than they do for fluid milk utilized in the regular manner. The drivers waived their commission on milk delivered to homes of the relief clients. The handlers operate on about a cost basis.

The relief agency, which in Missouri is the State Social Security Commission, handles the certification and officially issues the order for the milk to be delivered. Then the Federal government pays to the handler the difference between the cost of the milk and the 5 cents paid by the Social Security Commission.

With respect to the price paid producers, even though the price is less than that for fluid milk utilized in the usual manner, it is considerably higher than the price paid for milk used in Class II or for manufacturing purposes. For instance, in April, the regular Class I price is $2.44 and the price for relief milk is $1.98 while the Class II or manufacturing price is $1.63. Thus for every 100 pounds of milk sold as relief milk, the producers will receive 35c more than the Class II price. In other cities the producers' price is similarly regulated.

In simple terms, the Surplus Marketing Administration pays to handlers supplying milk under the relief programs, the difference between what the handler receives from the relief agency which is generally 5 cents per quart, and what the handler pays the producer for the milk, plus a specified allowance for processing, handling and delivery.

The amount of these payments varies according to local conditions and usually on the basis of competitive bidding upon which the handlers are selected. The payments range from 1.7 cents to 3 cents per quart.

Using the month of March 1941 as an example, if the relief milk program had been in effect in St. Louis, the amount of the payment to handlers by the Surplus Marketing Administration would have been arrived at in the following manner:

The price to producers for milk sold to relief clients eligible under the program would have been 4.04 cents per quart. The Administration has allowed St. Louis handlers under contract 2.75 cents per quart for handling and processing, making the total cost per quart 6.79 cents, or 1.79 cents per quart more than the relief client pays.

This 1.79 cents per quart constitutes the "benefit or indemnity" which the Surplus Marketing Administration pays to the handler and which was authorized under the amendment to Public Act. No. 320 to which I have previously referred.

The Administration, in addition to limiting the quantities of milk which needy persons may receive, also has taken definite precautions to see that none of it is resold. Every quart of the relief milk not only meets the health requirements, but in addition, it is plainly labelled as relief milk and is not to be resold.

In St. Louis, at the end of each delivery period, the driver obtains certification by signature of the recipient that the quantity of milk ordered has been delivered to each eligible relief client. These are turned in to the handler; required proof is submitted to the Social Security Commission which pays at the rate of 5 cents per quart and the Surplus Marketing Administration remits to the handler for the difference.

Since the program for St. Louis was

approved on the last day of March, we have no figures yet as to what the participation and consumption will be. However, handlers have contracted to deliver up to 30,000 quarts of milk per day to relief recipients in the city of St. Louis and part of St. Louis county.

To just what extent the programs have actually increased the per capita consumption of milk among needy families cannot accurately be measured except in one instance. A Department of Agriculture survey conducted in Washington showed that purchases of milk by those families participating in the program were nearly three times as great each week as they were before the program was put into effect. The following facts with respect to consumption in other areas may be of interest.

Under the Boston program 37,092 families on relief purchased 682,614 quarts of milk in eleven days in February of this year, an average of 1.67 quarts per day per family.

During the month of February, 1941, in Chicago, 2,719,609 quarts of milk went to 65,000 relief cases, an average of 1.49 quarts per day per family.

In the same month, in New Orleans, 10,370 families on relief purchased 197,019 quarts of milk, an average of 0.68 quart per day per family; and in New York city, 51,179 relief recipients with 135,877 children under 16 years of age, have received coupons for 1,980,075 quarts of milk for the 30-day period beginning on March 15, 1941, which will give them an average of 1.38 quarts per day per family.

In connection with the relief milk programs, the Department has been developing since May, 1940, programs to increase the consumption of milk among needy children by making available to them milk for consumption on school premises at a cost not to exceed one cent per half-pint. Purposes, objectives and the mechanics of these school milk programs which now are in effect in New York and Chicago, are essentially the same as those of the relief milk programs.

It might well be asked why these programs have not been more generally adopted.

Generally speaking, the Department's first requirement is that there must be effective control of the price paid to milk producers in the form of a Federal marketing order, state regulation which has proved effective, or the existence of a producers' cooperative which controls the supply of milk.

To date, the programs have been confined to areas in which Federal marketing orders are in effect, but the Department has pointed out that this is not an exclusive policy.

Logically, the amount of financial aid the Surplus Marketing Administration can extend in relief milk programs is limited to funds available under Congressional appropriation. The Administration must, of necessity, seriously consider per unit costs of distribution wherever and whenever applications for relief milk program are received.

Furthermore, the agency of control of producer prices must be sufficiently responsible, in the judgment of the Administration, to guarantee that producers will receive the special price agreed upon for relief milk and not a lower one.

Again, the Department weighs heavily the matter of whether or not a program for a given locality will actually increase the consumption of milk among the needy or low-income groups. Almost equal consideration is given to the method of distribution which seems most feasible and in this connection, it should be said that the station-distribution method is most favored because the cost generally is lowest.

Any responsible agency in any community, however, may take the first step toward a relief milk program by requesting the Department of Agriculture to consider it. The result of the Department's investigation which follows such application is the final determining factor as to whether the program will be instituted.

New Laboratory Equipment Aids Food and Milk Inspectors *

A new vial outfit for the routine collecting of samples of food, milk, liquids or swabbings to be analyzed for bacterial content was recently developed by the Bureau of Laboratories of the City Health Department and chiefly as the result of the efforts of Theodore C. Buck, Jr., Assistant Director of the Bureau. The outfit previously used consisted of a sterile test tube with a cotton swab and stopper. The tube had to be carried in an upright position because samples were often spoiled by the salt solution coming in contact with the cotton stopper. It was because of this and other disadvantages that attention was directed toward developing the improved sampling device.

As shown in Figure 1, the new equipment consists of a glass vial approximately 70 x 20 millimeters in size with a plastic screw type cap which holds a wooden applicator with cotton attached to the end. The salt solution or medium is placed in the vial, which has a capacity of 15 cubic centimeters with the cap screwed on loosely, and the entire outfit is sterilized. After the tube has been cooled the cap is tightened and the vial placed in the refrigerator until needed. The inspector may carry ten to fifteen vials in his pocket or several times this number in his kit, without fear of contaminating them. After a preliminary study of several months this outfit was found to be a very satisfactory one.

The rim of one glass (or cup) three-quarters of an inch from the top is swabbed using the outfit described in Figure 1. The swab is immersed in the salt solution and drained on the inside of the bottle. This procedure is repeated until five glasses (or cups) have been swabbed. The cap with the swab is put into the solution finally, the cap screwed on, and the entire outfit submitted for bacteriologic examination. A plate count is made either of an aliquot of the solution or the entire salt solution in the bottle, and the results are divided by five to give the bacteria per rim of each glass or cup. The tines of forks or bowls of spoons are also swabbed in the same manner, except that the swabbing is made of the entire tine or entire bowl.

Samples first collected in the improved vials were swabbings of drinking glasses from a soda fountain which had been inspected by the Bureau of Food Control. For this type of work, the vials contained 5 cubic centimeters of salt solution. The bacterial counts obtained from one swab which is used to rim five or ten glasses may range from less than ten bacteria to many hundreds of thousands of bacteria per glass. A bacterial count above five hundred per glass is held to indicate improper washing, and when found is followed up promptly by the Bureau of Food Control.

The new vial is used with broth to locate the source of bacteria, such as the staphylococci in connection with investigating food poisoning outbreaks. It is also used for detecting post-pasteurization contamination of milk due to improperly sterilized equipment. After several years of examining pasteurized milk and milk products from the pasteurizing vat and finding them free of coliform bacteria, it became evident that the source of contamination with these organisms lay somewhere between the pasteurizer and bottle filler. Swabbings were made from dairy equipment and employees for probable sources of contamination. The vial with a 0.5 cubic centimeter capacity pipette and rubber nipple attachment as shown is used for collecting the samples of milk or milk products. This eliminates the necessity of collecting gill, pint, or quart bottles of

* *Baltimore Health News*, 1941, page 158.

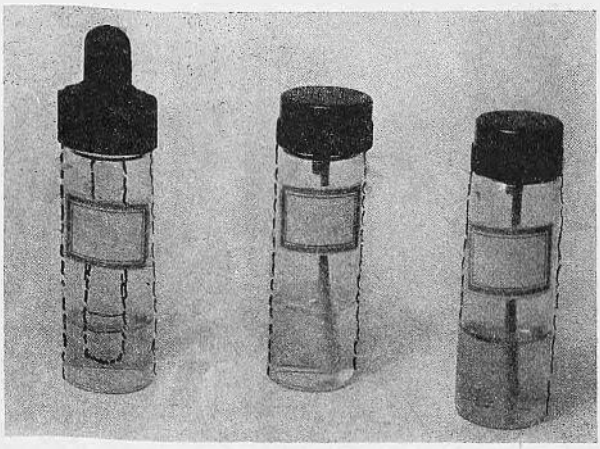

FIGURE 1. *New Sampling Containers*

the various products for special tests of this kind. The outfits usually require no icing or refrigeration if the samples are submitted to the laboratory within five hours after collection. In this way the Bureau of Milk Control is provided with a practical method for the sanitary supervision of dairy equipment and products, and an improved field procedure in food control has been made available.

New Fibre, Made from Cow's Milk, Used in Textile Manufacturing

After four years' experimentation, National Dairy Products Corporation today announced successful processing of a new textile fibre for which cow's milk is the raw material.

Subjected to exhaustive tests, including resiliency, tensile strength, abrasion, odor, affinity to dyes, and ability to withstand dry cleaning and washing, the new fibre has been accepted in the textile industry and is being used in the manufacture of various kinds of fabrics. The fibre, made from casein, a by-product of skim milk, can be blended with wool, mohair, cotton, rayon or fur in varying proportions.

The new material—a protein fibre of the prolon family—which National Dairy calls "Aralac," imparts distinctive characteristics to fabrics in which it is used. It is more expensive than rayon and cotton; less costly than fur and wool.

"Aralac" supplies drape and substance which previously could be obtained only through the use of fur and wool in some fabrics. Blended with rayon, it produces fabrics of unusual beauty.

The latest use developed for the new fibre is in hair-waving. As a result of recent successful experiments, a specially prepared "Aralac" fibre braid ("Wavecrepe") will be used to protect the hair in the permanent waving process. It has been found suitable for winding with the ends of the hair before they are heated and waved.

The significance of the fibre in dairy farming economy is potentially important. Billions of pounds of skim milk—the residue after butterfat has been extracted for butter, table cream or other purposes—now do not have any commercial market. Most skim has been used as feed for livestock. While the present lease-lend demands for powdered skim for export have changed that situation to some extent, the war's end probably will see the finish of this abnormal situation.

The fibre is made at Taftville, Conn., by Aralac, Inc., a special manufacturing division established by National Dairy for that purpose. Present production capacity is about 5,000,000 pounds a year—the recoverable casein content of about 160,000,000 pounds of skim milk. The factory has been operating on a 24-hour basis for about four months, following more than two years' pilot plant operation at Bristol, R. I.

Processing of fibre from milk is not new. As far back as late in the last cen-

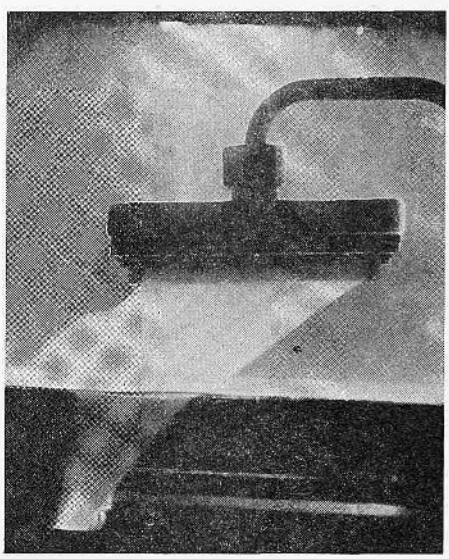

FIGURE 1

Making Fibre from Milk

This unretouched photograph depicts a spinneret through which honey-like viscous casein is converted into fibre. To show the fibre at the exact moment when it emerges from the spinneret, the operation was simulated in a glass-enclosed case, using a chemical solution more transparent than that in which the spinneret normally is immersed. The spinneret contains holes, through which viscous casein is forced under high pressure. The fibre is not a solid mass, as it appears to be, but thousands of different strands.

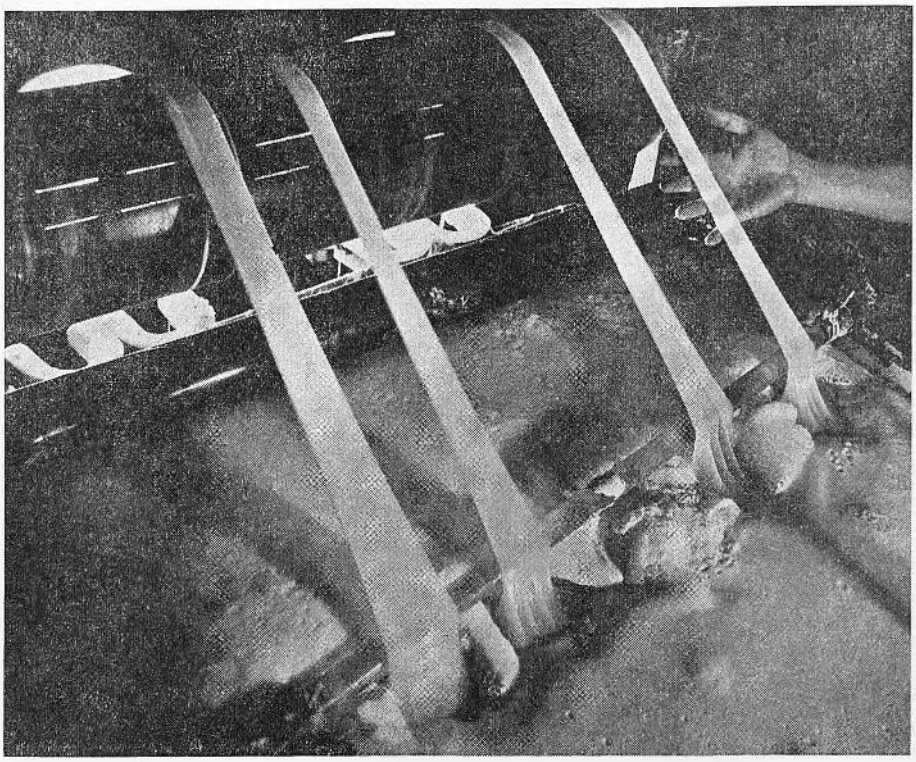

FIGURE 2

Making Fibre from Milk

The foamy mass conceals four spinnerets in the spinning box. This is an unretouched photograph of an actual operation in making "Aralac" fibre. In those four "tapes" are thousands of strands of fibre. The hand at the right indicates translucency and relative size.

tury—even before rayon was developed—scientists were experimenting with casein fibre. Not until the introduction of "Aralac," however, was milk-derived fibre acceptable to the American textile industry.

National Dairy began investigating the possibility of producing a high-grade fibre from casein in 1937. As one of the world's largest processors and distributors of dairy products, it was concerned about the vast amount of skim milk for which there was no commercial outlet. Increasing amounts of casein were being used in paper-coating, plastics, paint, and in other industries, but about 80 percent of the nation's skim milk was without any commercial outlet.

Atlantic Research Associates, Inc., Newtonville, Mass., a staff of scientists and technicians, worked for months in the laboratory before they were ready for even experimental manufacture. They investigated all previous attempts to make satisfactory fibre out of casein and finally succeeded in overcoming what hitherto appeared to be insurmountable obstacles. Sheffield By-Products Company co-operated by providing improved casein.

The felt hat industry was the first to use "Aralac." Confronted with scarcity of foreign rabbit and hare fur and rising prices, fur-felt manufacturers conducted many experiments in quest of a satisfactory replacement. "Aralac" eventually

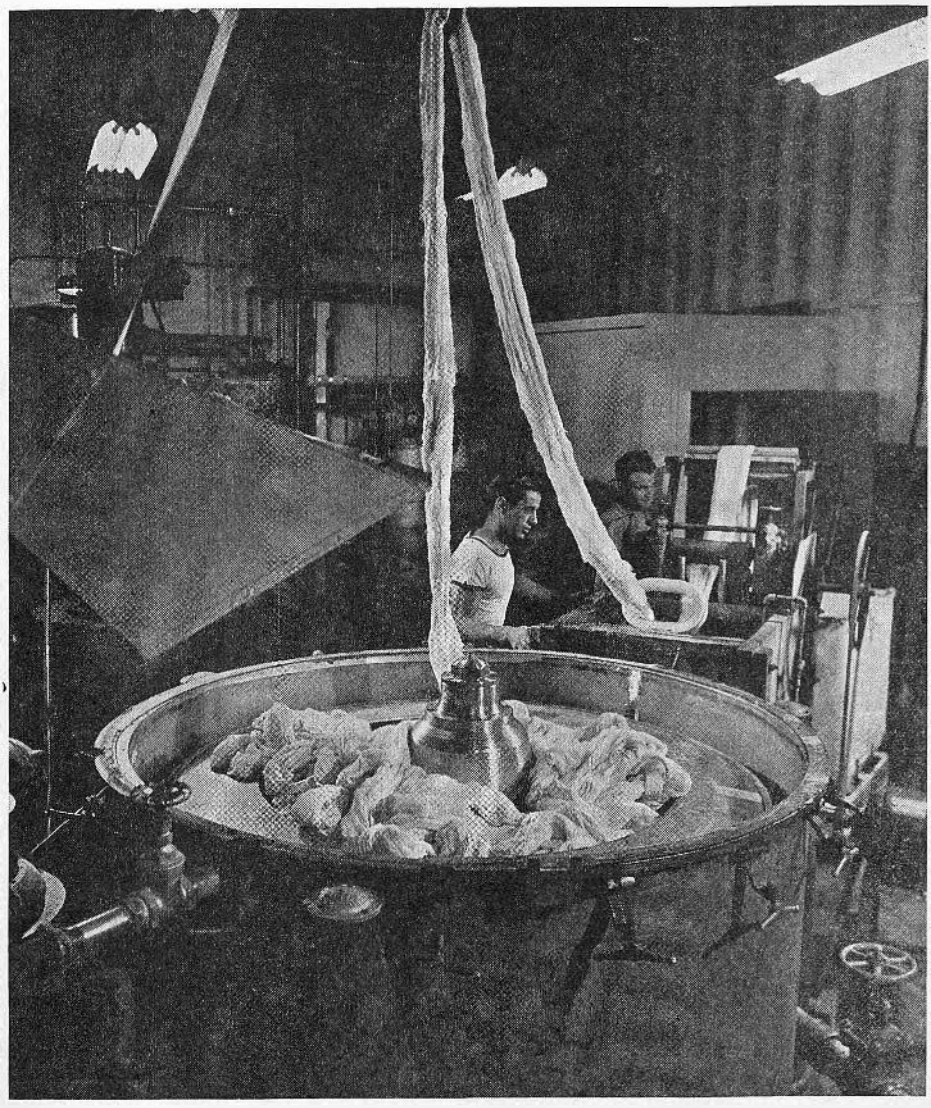

FIGURE 3

Making Fibre from Milk

In this centrifugal machine, the fibre is freed of chemicals, which are recovered for use again. The fibre then goes through another washing process.

was accepted. In 1940, many fur-felt hats contained the milk-derived fibre; today most fur-felt and wool-felt hats in the United States, Canada and South America are made in part from cow's milk. "Aralac" has enabled hat manufacturers to maintain reasonable prices without impairment of quality, despite the scarcity of imported rabbit fur due to war conditions.

Textile mills also had been experimenting with "Aralac," but several

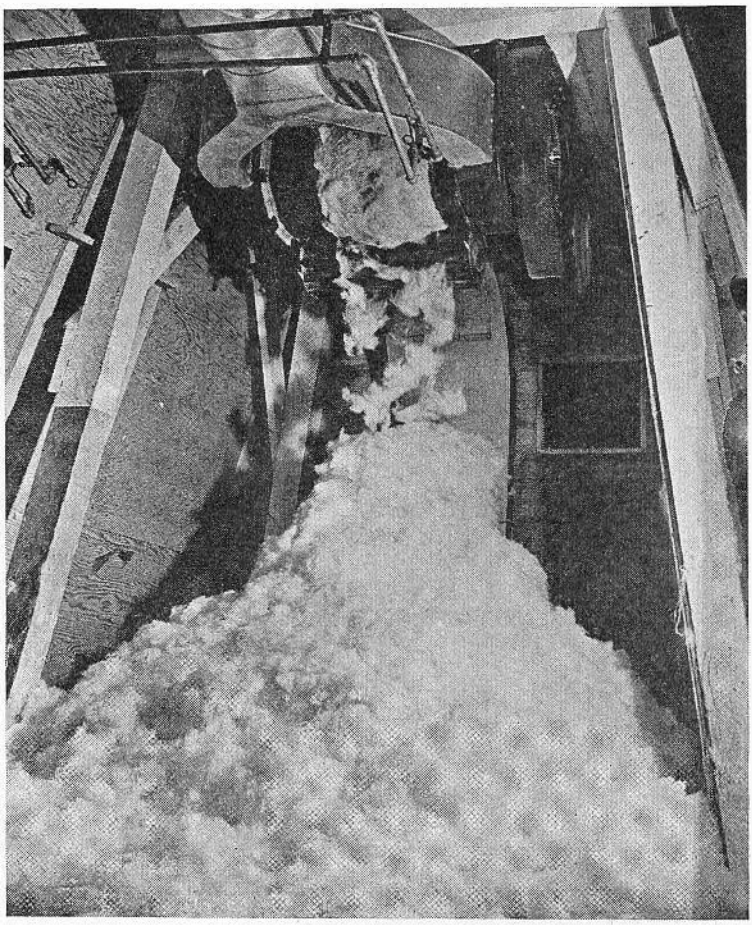

FIGURE 4

Making Fibre from Milk

Finished fluffy "Aralac" fibre, ready to be pressed into 450-pound bales. It is used in Canada and South America as well as the United States.

processing changes were necessary before desirable blending qualities with other fibres were achieved. While the fibre was basically the same as for hats, certain adjustments had to be made in the finishing. After the processing for textiles had been perfected, the casein product was found to possess characteristics which, in some instances, resulted in fabric improvement.

Casein constitutes about 3 percent of skim milk. After being extracted from milk, dried and ground, it is treated with chemicals and heated into a viscous, honeylike form. Forced through spinnerets under hydrostatic pressure, the emulsion emerges as thousands of strands of fibre, called "wet tow." After many other treatments, it becomes soft and luxurious. It can be cut into almost any desired length—from a half-inch to a half-mile.

Legal Aspects

Control of Sale of Eggs Uphold *

(Minnesota Supreme Court; *State* v. *Houston,* 298 N.W. 358; decided May 29, 1941.) An ordinance of the city of Minneapolis relating to the purchase and sale of eggs established grades for the retail trade of eggs in the city. All eggs that were not graded had to be marked "unclassified" but nothing in the ordinance made grading compulsory. The defendant was charged with selling a quantity of eggs, some of which were in fact grade B and undergrade, as grade A. He was convicted of violating the ordinance and appealed to the Supreme Court of Minnesota.

It was urged on appeal that the ordinance was void, the first reason assigned being that the city lacked the power to pass it. In holding that this contention was without merit the appellate court said that the necessary authority was found in several provisions of the city charter. There were quoted portions of the charter which authorized ordinances for the government and good order of the city and which gave authority, by such ordinances, to license and regulate shops for the sale of provisions, to regulate the inspection of provisions, and to make all regulations which might be necessary and expedient for the preservation of health and the suppression of disease. The court said that regardless of whether the ordinance was authorized by the general welfare clause of the charter, it was clear that it was authorized by the other subsections quoted. "While the word 'eggs' is not specifically mentioned, in any of the subsections, the word 'provisions' is used, and eggs are provisions as that term is commonly understood."

The next claim made by the defendant was that, if the city ever possessed the power to pass the ordinance, such power was taken away by the enactment of chapter 471, Laws of 1937. This law related to the grading, etc., of eggs and, by virtue of the authority granted therein, the State department of agriculture promulgated certain regulations regarding the grading and sale of eggs, which regulations were substantially the same as those contained in the city ordinance. There was no express provision in the statute prohibiting any municipality from legislating on the same subject matter, nor was anything found in the act from which such prohibition might be implied. The supreme court stated that a municipality, if it had proper delegated authority and if it legislated consistently with State law, could make an act an offense against the municipality although it was by statute an offense against the State. "Such an ordinance does not punish the violation of the State law but establishes a local law, the infraction of which it punishes." The court held that the ordinance did not conflict with the State law, was not an infringement thereof, and that the statute did not take from the city council the power to pass the ordinance.

The final claim of the defendant was that the ordinance was unnecessary to the regulation of the subject matter and was so unreasonable as to be an arbitrary exercise of power and void. In rejecting this contention it was said that courts had no power to declare an ordinance void as being unreasonable unless the unreasonableness was so clear, manifest, and undoubted as to amount to a mere arbitrary exercise of the power vested in the legislative body, and that the court did not so consider the instant ordinance.

The judgment appealed from was affirmed.

* *Pub. Health Repts.* **56,** 1481 (1941).

A Hospital Epidemic of Flexner Dysentery Caused by Contaminated Ice. E. J. Godfrey 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.

Public Hearing January 5 on Proposed Ice Cream Standards

The Federal Security Agency will hold a public hearing on January 5, to receive evidence upon the basis of which regulations may be promulgated fixing and establishing definitions and standards of identity under the Federal Food, Drug and Cosmetic Act for ice cream, frozen custard, sherbet, water ices and related foods.

The hearing will begin at 10:00 A. M. and will be held in Room 1039, South Building, 14th Street and Independence Avenue, Southwest, Washington, D. C.

All interested persons are invited to attend. Relevant evidence may be presented in person, by representative, or by affidavit. Affidavits will be received up to the day of the hearing. They should be addressed to the presiding officer, Thomas C. Billig, Room 2242, South Building, 14th Street and Independence Avenue, Southwest, Washington, D. C. Lack of opportunity for cross-examination will be considered in the case of affidavits.

Complete information is published in the Federal Register of November 1. Copies may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 10 cents each.

Oleomargarine Again (Yet)

Federal Security Administrator Paul V. McNutt announced today he had notified Ralph E. Ammon, Director of State Department of Agriculture, Madison, Wisconsin, that "it is in the public interest" to deny the petition of the United Dairy Committee for a rehearing on the standard of identity for oleomargarine established by the Federal Security Agency.

The United Dairy Committee, composed of farmers of many of the dairy States and headed by Mr. Ammon, conferred with Mr. McNutt on September 24. At that meeting the committee appealed for a rehearing on the entire standard and particularly requested a reexamination of the legal basis for the inclusion of diacetyl as a flavoring ingredient in oleomargarine. This standard became effective September 5, 1941, following a hearing held in November, 1940.

After conferring with the Federal Security Agency's legal staff, the Administrator said he had been advised that upon the evidence already in the record, there is no legal basis upon which he could prohibit the use of diacetyl in oleomargarine under the authority of the Food, Drug, and Cosmetic Act. In his letter to Mr. Ammon, the Administrator added:

"I am further advised that even if there was an adequate basis for rescinding the entire definition and standard, and this were ordered, oleomargarine containing the ingredients named in the standard could continue to be manufactured with entire legality; that is to say, diacetyl and benzoate of soda could be used legally if clearly declared on the label. The same is true of artificial color, with the additional proviso that the heavy internal revenue tax on the colored article would have to be paid, as is now the case. In two respects, however, the situation would differ, if the definition and standard were recalled, from that now prevailing: (1) There would be no express legal requirement compelling oleomargarine to meet the fat standard now imposed by law upon butter; (2) oleomargarine making claims for Vitamin A content could not be required to contain a definite amount of such vitamin."

Mr. McNutt pointed out that basically, the definition issued for oleomargarine goes back to that contained in the oleomargarine tax law of 1886, in which Congress recognized oleomargarine as a product made in imitation of butter and imposed specific taxes on its manufacture and sale.

New Books and Other Publications

The Frozen Food Industry, by Harry Carlton. Published by University of Tennessee Press, Knoxville, Tennessee, 1941. 187 pages.

This book is an up-to-date veritable mine of information to those who want a convenient, readable, and reliable presentation of a general view of the frozen foods industry. It gives detailed figures of yields and costs of producing, processing, and distributing many frozen food products. It informs the reader concerning trade practices in handling the cabinets, in merchandizing the food, in operating the warehouses, in transportation, in processing by the several different methods, and in the growth of the industry. Milk and ice cream inspectors and food control officials will be interested in reading the book because of the growing practice among ice cream dealers to handle frozen foods in their low temperature plants, vehicles, and retail distribution outlets. Food inspectors in general will value the book because it affords them means to inform themselves about a new and rapidly growing branch of the food industry. The main emphasis is given to the more strictly business aspects of the industry rather than to the technological problems, although 36 pages were devoted to processing operations. Much of the cost data are quotations from operators—more or less necessary when dealing with the general aspects of the industry as a whole. It constitutes a useful addition to the growing library of food technology.

Standard Methods for the Examination of Dairy Products. Eighth Edition. American Public Health Association, New York, N. Y. 1941. 288 Pages. $3.00.

This new edition of the well-known "Standard Methods" has been enlarged by almost one hundred pages over the seventh edition of 1939.

There is added, Section D, V, "The Resazurin Test," a desirable addition.

Particularly noteworthy additions are those dealing with the microbiological methods for examining the ingredients of ice-cream and other frozen desserts. These comprise butter, the concentrated milks, coloring and flavoring materials, sweetening agents, and eggs. There is much new text on sediment testing.

The section on "Tests for Sterility of Equipment" has been enlarged from two pages to sixteen pages, excellently arranged and illustrated.

The Appendix, dealing with the several current phosphatase tests, still presents the same four methods, revised to date.

"Standard Methods" has been useful ever since its inauguration. Now it has become really necessary. The editors and publishers are making material contributions to sanitation and improved public health practice by their care and devotion to this great task—hard work of a gruelling kind, but a labor of love that is appreciated by us all.

JOURNAL OF MILK TECHNOLOGY

Official Publication of the

International Association of Milk Sanitarians

(Association Organized 1911)

THE JOURNAL OF MILK TECHNOLOGY is issued bimonthly beginning with the January number. Each volume comprises six numbers. It is published by the International Association of Milk Sanitarians, and is printed by The Chronicle Press, Inc., Orange, N. J., U. S. A.

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Membership and Dues: Active membership in the Association is $3.00 per year, and Associate membership is $2.00 per year, including respectively all issues of the JOURNAL OF MILK TECHNOLOGY. All correspondence concerning membership in the INTERNATIONAL ASSOCIATION OF MILK SANITARIANS, including applications for membership, remittances for dues, failure to receive copies of the JOURNAL OF MILK TECHNOLOGY, and other such matters should be addressed to the Secretary of the Association, **C. Sidney Leete, State Department of Health, Albany, N. Y.**

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Association News

Chicago Dairy Technology Society

At the October meeting of the Chicago Technology Society, Professor M. J. Prucha, Department of Dairy Industry, University of Illinois, discussed the subject of paper milk containers.

1. The methods used for making paper are such that the finished product can be made practically sterile.

2. Paper milk bottles checked for bacteria by four different methods gave counts ranging from 0 to 172 per quart container. Seventy-six percent of them gave no colony growth.

3. Paper has a self-purifying action, as indicated by the results obtained with paper inoculated with *B. prodigiosus*. Eighty-seven hours after inoculation of the paper with a heavy suspension of the organism, none could be recovered.

4. Paraffin application at 170° F. for all practical purposes is sufficient safeguard against bacterial contamination of milk from paper, although there were cases of organisms surviving temperatures as high as 200° F.

Officers for 1942 will be nominated at the November meeting, and the election will take place in December. A meeting to honor the pioneers in the industry is planned for January. There are still living a few of the men who started our present industry, and posterity should have records of the valuable information on our early history which these veterans possess.

Shortage of skilled labor, increasing milk costs with scarcity of supplies, increased labor and material costs, increasing difficulty of obtaining desired equipment and supplies, and difficulties of maintaining quality are problems confronting the industry in this section of the country.

P. H. TRACY,
Secretary.

Kansas Association of Milk Sanitarians

The twelfth annual meeting of the Kansas Association of Milk Sanitarians was held at Kansas State College, Manhattan, November 13 and 14. Eighty persons, including 13 from commercial milk plants and 13 from dairy supply houses, registered for the meetings, the largest recorded attendance for the Association.

The program was as follows:

Milk Secretion—Dr. L. O. Gilmore, K. S. C.

Herd Management Practices of Interest to the Milk Sanitarian—Prof. F. W. Atkeson, Head, Dept. of Dairy Husb., K. S. C.

Sanitary Control of Water Supplies—Glen Boyles, Manhttan.

Personal Hygiene for the Food Handler—Dr. D. E. Bux, Director, Riley County Health Unit, Manhattan.

Direct Microscopic Examination of Milk as an Aid in Checking Faulty Production Methods—Dr. F. E. Nelson, K. S. C.

Round Table Discussion of Current Problems of Milk Sanitarians—Leon Bauman in charge, Chief of Milk Sanitation, State Board of Health; Farland Fransher, Tom Larson, Wilbur Feagan, Dan Van Gundy.

Some Experiences with Producer-Distributor Pasteurization Plants—O. L. Pretz, Kansas City.

Heating and Ventilation Problems and Their Solution in Dairy Plants—Tom Larson, State Board of Health, Topeka, and C. W. McDowell, Detroit, Michigan.

The Construction, Repair and Maintenance of Milk Plant, Dairy Barn and Milk House Floors—Prof. Walter G. Ward, K. S. C.

Short Time High Temperature Pasteurization—Wilbur Feagan, Consulting Engineer, Kansas City, Mo.

New Construction Materials for Milk Plants and Farm Dairies—J. F. Schaffhausen, Johns-Manville, New York City.

Waste Disposal Problems at City Milk Plants and Producer-Distributor Pasteurization Plants—M. L. Young, Acting Director, Division of Sanitation, State Board of Health, Lawrence.

Business Meeting, Kansas Association of Milk Sanitarians, Leon Bauman, President.

The Association voted to designate the JOURNAL OF MILK TECHNOLOGY as its official publication. Plans were made for a similar meeting next year.

W. J. CAULFIELD,
Secretary-Treasurer.

Metropolitan Dairy Technology Society

At the October meeting of the Metropolitan Dairy Technology Society, Dr. J. B. Stine of the Kraft Cheese Company, Chicago, spoke on the subject of recent developments in the cheese industry.

In Dr. Stine's talk, he pointed out that, because of the foresight and research work of American scientists and commercial cheese experts, the cheese industry is now able to put on the market American editions of many European types of cheese. Among these are Roquefort, Edam, Gouda, Muenster, Swiss, and various others. Some of these new types of cheese are equal or superior in quality to the European importations, although in most instances they do vary in some of their characteristics from those that are normally obtained from abroad. Dr. Stine further pointed out that practically all the cheese now being manufactured is being bought up rapidly, owing to American and Ally government demands.

The meetings of the society are now being held at the George Washington hotel on the corner of Twenty-third Street and Lexington Avenue, New York City.

O. F. GARRETT,
Secretary.

Michigan Association of Dairy and Milk Inspectors

After a year's deliberation, the Milk Ordinance Committee of the Michigan Allied Dairy Association has submitted its final draft of the Michigan Milk Ordinance. Representatives of the association will meet some time in November to review the ordinance and to take whatever official action is necessary to secure the approval of the members. The ordinance has had very careful consideration, and undoubtedly will fill a much needed place in the state.

Many members of the association attended the Tulsa convention of the International Association of Milk Sanitarians.

The annual meeting will be held some time in March.

HAROLD J. BARNUM,
Secretary-Treasurer.

New York State Association of Milk Sanitarians

The Pasteurization of Small Milk Supplies, Selling Inspection Service, Interstate Trade Barriers, Calfhood Vaccination, The Control of Thermoduric Bacteria, and New Developments in Milk Plant Equipment, were among the topics discussed at the fifteenth annual conference of the New York State Association of Dairy and Milk Inspectors held in Buffalo on September 24, 25 and 26. Some 475 people were in attendance at the meeting and reviewed the interesting exhibits of dairy farm equipment.

R. C. Borden staged a clinic at which he analyzed the reasons for failures on the part of dairy service men successfully to sell their ideas to dairy farmers and others.

L. J. Tompkins, Sheffield Farms Company, said that calfhood vaccination may help materially in stamping out Bang's Disease among dairy cattle. There may be a postive agglutination reaction up to thirty-nine months after vaccination, although the average is fourteen months.

Attention has been focused on the control of thermoduric bacteria in milk supplies as a result of the use of the new agar as prescribed by "standard methods" for making bacteria counts and the use of a 32 degrees C. incubation temperature. Theodore Marcus, Massachusetts Dairy Laboratories, Dorchester, said that it is now accepted practice and mandatory in some municipalities that a sample of each producer's milk be pasteurized in the laboratory in order to determine the thermoduric count. When the number of thermoduric bacteria in any supply is above average, an investigation is made at the farm. It has been found that unclean milk utensils are the most probable source of contamination.

Thorough cleansing and sterilization of all milk utensils will eliminate such contamination.

Due to the rulings of the Priorities Board of the Office of Production Management, dairy equipment manufacturers are finding it more difficult to obtain the commonly used metals. According to O. K. Burrows, Cherry-Burrell Corporation, Chicago, Illinois, the dairy industry is making every effort to procure satisfactory substitutes. Some materials, it is believed, may actually be of exceptionally good quality and will be retained after the emergency. Already several small pieces of equipment are available which should be of considerable value to milk plant operators and to control officials.

A removable union nut for pipe lines was among the interesting new developments exhibited.

C. S. Leete, New York State Department of Health, said that during the last eleven years, for every milkborne outbreak in a community of 12,400 population or over in this state there have been sixteen such outbreaks in communities with less population. In the latter group, the percentage of pasteurized milk consumed is much lower than in the larger communities. There is evidently a distinct relationship between milkborne outbreaks and the use of raw milk. Much of the milk in the less populous places is furnished by dealers handling relatively small quantities. Up to the present, it has been felt that equipment suitable for the pasteurization of small supplies was not available. Now, however, apparatus capable of pasteurizing milk in quantities as small as forty quarts is being sold at relatively low cost. With such equipment available, it is believed that many places may now have the protection afforded by pasteurization which has been denied them heretofore.

More and more dairy farmers are resorting to the use of milking machines as a means of overcoming labor shortages with the result that the sanitation of such equipment is becoming increasingly important. Dr. G. H. Hopson, De Laval Separator Company, New York City, said there is no reason why low count milk cannot be produced when milking machines are used. It is essential, however, that such apparatus be thoroughly rinsed and washed *immediately* after milking.

Dr. Samuel Hyman, district health office, Utica, emphasized the importance of a well-rounded health program during the present emergency. Experts in various lines are needed, of course, but each should realize that he contributes only a part to the general health program and that all should work together for the benefit of the entire service.

Mr. Robert H. Leding of the U. S. Department of Commerce discussed what he described as interstate trade barriers resulting from public health regulations governing the production and handling of milk. Although recognizing the necessity for protecting the public health he indicated an effort has to be made to avoid the application of such regulations as trade barriers.

Mr. G. W. Molyneux of the Westchester County Department of Health, White Plains, New York, was elected president of the association for the year 1941-42 and Mr. W. D. Tiedeman was re-elected secretary-treasurer. An amendment to the constitution was passed changing the name of the association, effective immediately, to New York State Association of Milk Sanitarians.

W. D. TIEDEMAN,
Secretary-Treasurer.

Texas Association of Milk Sanitarians

The third annual meeting of the Texas Association of Milk Sanitarians was held November 2, 1941, at the Plaza Hotel, Corpus Christi, Texas.

In the absence of the President, the Secretary-Treasurer, Mr. Taylor Hicks, presided. Some twenty or twenty-five members were present. The following interesting lectures were presented:

A Review of the 1939 U.S.P.H.S. Ordinance and Code, F. J. Moss, U.S.P.H.S.

A One Man Milk Control Program for a Texas City, Dr. Hubert Shull, Texarkana, Texas.

Significance of *E. coli* in Milk, J. E. Murphy, State Laboratory, Austin, Texas.

Causes and Methods of Removing Milk Stone, Homer Fisher, Milk Sanitarian, Dallas, Texas.

The Cause and Control of Spreaders on Milk Plates, J. E. Murphy, State Laboratory, Austin, Texas.

On Monday, November 3rd, this Association held a joint meeting with the Food and Drug section of the T.P.H.A. After adjournment of this meeting, officers were elected for the ensuing year.

Mr. Homer Fisher of Dallas was elected to the Membership Committee and Mr. William W. Eason of Brownfield was elected a member of the Executive Committee.

G. G. HUNTER,
Secretary-Treasurer.

New Members

Belmar, Harry B., Meat and Milk Inspector. Houston County Health Department, 1300 W. North St., Dothan, Ala.

*Blevins, Lewis, County Sanitarian, Pratt County Public Health Department, 106 East Second St., Pratt, Kan.

*Frederick, Hoyt, Radford Milk Inspector, Virginia State Board of Health, Christiansbury, Va.

Freeman, Archie B., Assistant Health Engineer, U. S. Public Health Service, 112 Federal Office Building, San Francisco, Cal.

*Iverson, C. A., Professor and Head of Dairy Industry Department, Iowa State College, Ames, Iowa.

Johnson, Ralph J., Public Health Engineer, City Health Department, Peoria, Ill.

*Key, Joseph F., Milk Sanitarian, Macon Health Department, 467 Napier Avenue, Macon, Ga.

*Nelms, Ralph E., General Manager, The Borden Co., Denton, Texas.

*Owen, W. Ludwell, Jr., Bacteriologist, Director of W. L. Owen Laboratory, P. O. Box 1345, Baton Rouge, La.

*Pulkrabek, G. M., Kraft Cheese Co., 500 Peshtigo Court, Chicago, Ill.

*Ramsey, R. J., Production Mgr., Telling-Belle Vernon Co., 21853 Cromwell, Rocky River, Ohio.

*Reed, Carroll L., Sales Representative, Crown Cork & Seal Co., 123 S. Walnut Street, West Chester, Pa.

*Riddick, John L., Salesman, Johnson & Johnson, 520 E. Sixth Street, Alton, Ill.

*Rothman, Gerald St. John, Assistant Chemist, Sunnydale Farms Inc., 7935 Grand Avenue, Elmhurst, L. I.

*Schlenker, W. F., Milk Inspector, City Laboratory, City Hall, Des Moines, Iowa.

Schultz, Samuel L., Health Inspector, N. Y. City Department of Health, 621 Lenox Road, Brooklyn, N. Y.

*Shaner, Joe Nelson, Milk Sanitarian, State Department of Health, City Hall, Carroll, Iowa.

*Stacey, Richard C., Manager, North Jersey Dairyland, Inc., 164 Oakland Terrace, Newark, N. J.

*Stewart, Robert J., Chief Engineer, Crown Cork & Seal Co., Severna Park, Md.

*Wilson, George, Milk Superintendent, The Borden Co., Lubbock, Texas.

* Indicates Associate membership.

Changes in Address

*Abbott, Carl A., Syracuse, N. Y. Deceased.

*Bejeck, Otto, Sanitary Inspector is now located at 34 West Cambridge Ave., Phoenix, Ariz.

*Fenton, Paul, Now 10 Griswold Street, Walton, N. Y.

Fowler, O. W., Now 1837 North Laurel Avenue, Phoenix, Ariz.

Keith, J. I., Now Secretary-Treasurer, Oklahoma Butter Institute, 119 N. W. 23rd Street, Oklahoma City, Oklahoma.

*MacCrea, E. C., Camillus, N. Y. Deceased.

*McCutchen, John H., Milk Engineer is now with the Jackson County Health Department, Independence, Mo.

Moutrey, Curtis E., Now State Health Department, Oklahoma City, Oklahoma.

*Strachan, R. C., Now Rooms 307-8, 7310 Woodward Avenue, Detroit, Mich.

*Stull, S. R., Now 308 Second Street, Towanda, Pa.

Weber, C. W., Now Albany, N. Y.

* Associate

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"Doctor Jones" Says—

"Speaking of typhoid fever from water —this business of analysis of water samples: I find it's confusing to a good many people. Back last summer, for instance, a woman in one of these summer boarding places came down with typhoid and they claimed it was the well water. They hired a lawyer to start a damage suit. Of course I'd taken samples and had 'em analyzed and he came in to see the reports—this lawyer did. The first thing he wanted to know—he says: 'Did they find typhoid bacilli?' When I told him they reported colon bacilli present but didn't look for typhoid bacilli, he started to get up on his ear. I guess maybe he thought we were holding out on him or something. But I finally got him straightened out.

"You see the fact of the matter is: looking for typhoid bacilli in a sample like that—it'd be some like trying to find a couple of pennies you dropped somewhere on Broadway the day before. Even if they were still there the chances'd be against finding 'em. So they have to depend on what you might call circumstantial evidence. These colon bacilli, they're intestinal organisms, too, and if there's that kind of pollution there's more of 'em and they're easier to find.

PAUL B. BROOKS, M.D.

* Health News, New York State Department of Health, May 6, 1940.

"It's some like when you hear a commotion in the henhouse: when you get out there you find a chicken gone and detect certain odors; you sort of put two and two together and conclude it probably was a skunk—even though you don't see one. Of course, the colon bacilli—it ain't quite so simple as that. But you know they're either animal or human, and when you take the samples you look over the situation—make a survey, as they call it, so you've got a pretty fair idea whether it's liable to be of animal origin, like drainage from a barnyard or what not, or human—like a cesspool or something. One thing you've got to look out for, though: folks are liable to have colon bacilli on their hands and unless you're awful particular taking the sample they can get washed into it and show up in the laboratory examination.

"Anyway, if it looks like it's human, then you start trying to locate the typhoid case or carrier the pollution came from. The only way anybody ever gets typhoid is from another person that's infected with typhoid germs.

"The trouble with this kind of stuff, there's most always some ifs and ands about it. You can't usually 'answer yes or no.' You sort of put two and two together and if it makes four it's probably the right answer—*if* you haven't made a mistake somewhere."

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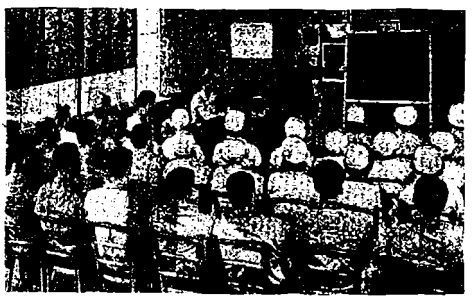

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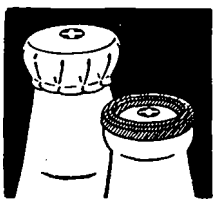

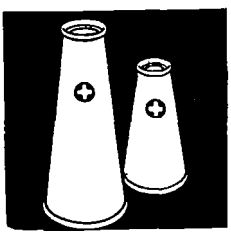

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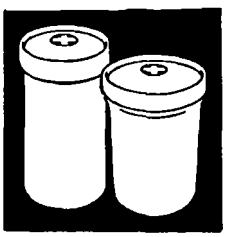

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No. 278 High Bacterial Counts — Causes and Remedies
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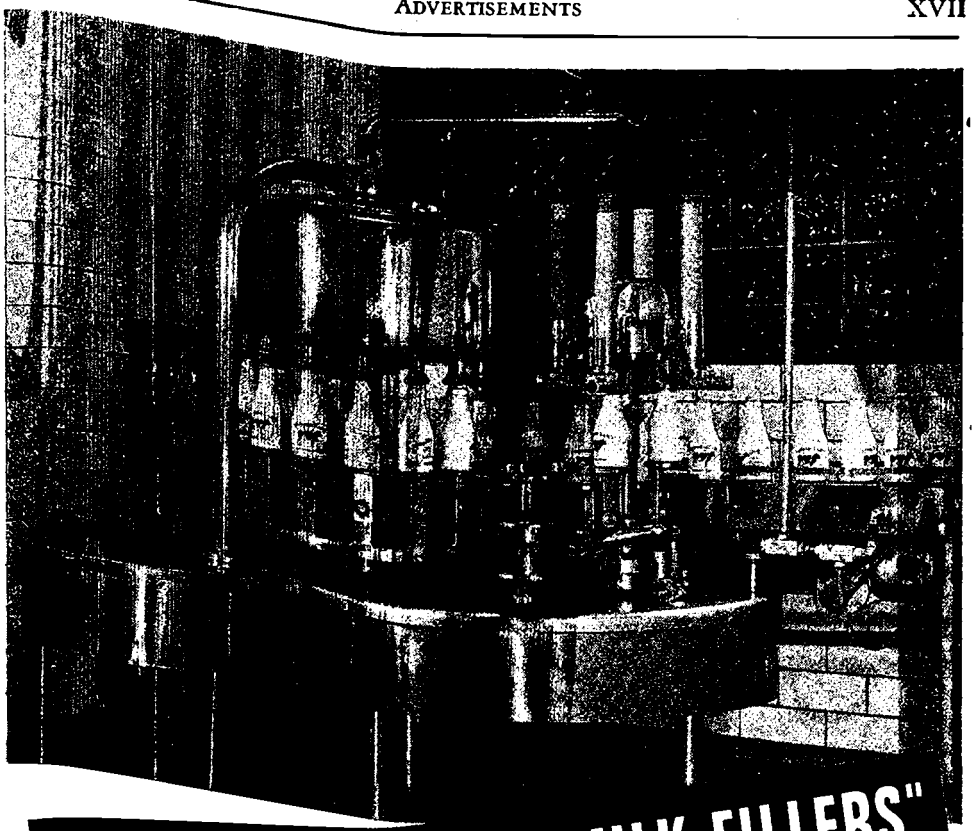

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