JOURNAL OF MILK TECHNOLOGY

SEPTEMBER-OCTOBER
1943

VOLUME 6 NUMBER 5

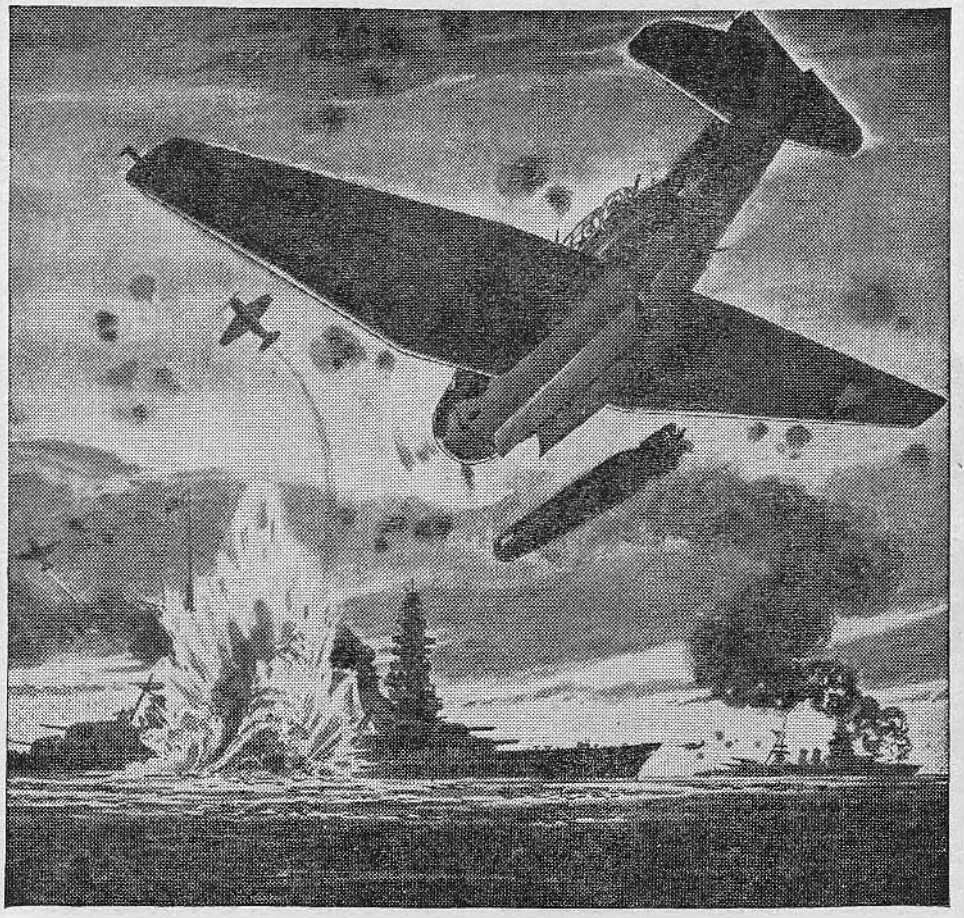
The Thirty-Second Annual Meeting has been

CANCELLED

(see pages 257 and 308)

Official Bimonthly Publication of:
INTERNATIONAL ASSOCIATION of MILK SANITARIANS
(Association Organized 1911)

Designated Official Organ of:
ASSOCIATIONS OF MILK INSPECTORS and SANITARIANS and DAIRY TECHNOLOGY SOCIETIES
Listed on Page 307



There goes $25,000 worth of hair-splitting

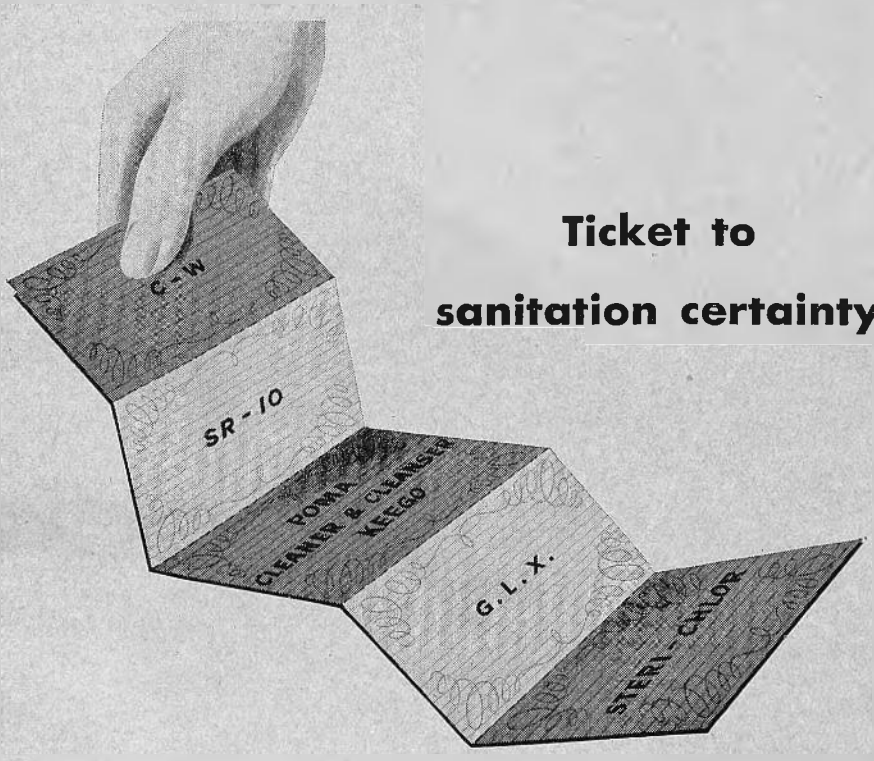
MAKING the exact and delicate parts of an aerial torpedo is almost a hold-your-breath job. It requires machines of great precision and craftsmanship of top-ranking order.

This job is being done with the same craftsmanship which made Standard's Welded Wire Seal machinery the finest in use by the dairy industry.

The same skilled craftsmanship is also helping the dairy industry protect the nation's milk supply. There is no shortage of Welded Wire Hood Seals—the War Department itself recognizes their importance.

STANDARD CAP AND SEAL CORPORATION

★ ★ ★ ★ 1200 Fullerton Avenue, Chicago, Illinois ★ ★ ★ ★



Ticket to sanitation certainty

THAT'S THE GOAL all dairy operators seek—sanitation certainty, achieved without harm to equipment or product. And the quickest, most saving way *to* that goal is the Wyandotte way . . . with a Wyandotte Representative giving you a friendly hand, backed by *trained* know-how.

One lap toward the goal may be can washing. The ticket calls for C.W., Wyandotte's Special can-washing product. Milk-stone removal next? Try SR-10, Wyandotte's latest and most efficient answer.

Whether water is average, hard or *hardest* — the cleaning problem posed calls for Wyandotte Cleaner and Cleanser, Poma or Keego. Spots or other deposits on surfaces of monel, steel or glass? They bow to G.L.X., the Wyandotte "sudsing" cleaner. And for the germicidal rinse after cleaning, there's Wyandotte Steri-Chlor — a germicide that gives germs a one-way ride.

Whatever your problem in washing *all* equipment used in handling milk or other dairy products, the Wyandotte ticket has met all tests. When in doubt, call in the Wyandotte Representative. He speaks with years of experience and specialized training —and he's always ready to advise you.

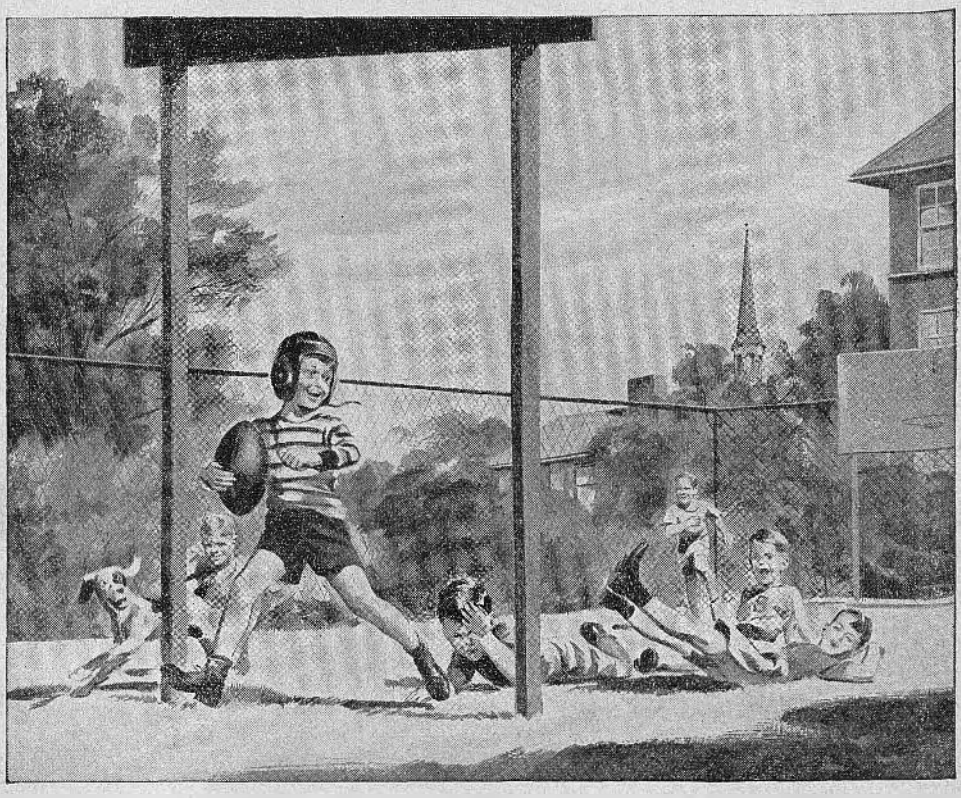
FOR DAIRY FARM USE! Wyandotte offers a special line of cleaners and a germicide for dairy farm use, packaged in convenient sizes. Write us today . . . or ask the Wyandotte Service Man.

Wyandotte

SERVICE REPRESENTATIVES IN 88 CITIES

WYANDOTTE CHEMICALS CORPORATION • J. B. FORD DIVISION • WYANDOTTE, MICHIGAN

• Wyandotte Chemicals Corporation consolidates the resources and facilities of Michigan Alkali Company and The J. B. Ford Company to better serve the nation's war and post-war needs.



POST-WAR TRIPLE THREAT

IN THE DAYS TO COME, it will be lads like this who will "rock 'em" in the stands . . . husky youngsters that America is building to direct the work and the play of the post-war world.

Fresh milk is an important factor in keeping America strong. And, the paper container method of delivering this milk deserves and is receiving increasing recognition. This method has the approval of Public Health authorities as well as dairy men.

These people know that paper containers have a single-trip advantage. This means that the containers are used only once and then thrown away.

From a public health standpoint, the paper milk containers of American Can Company are of special interest. These containers are the result of a program of highest sanitary control.

Starting with the pulp at the paper mills, this program continues through every manufacturing process until the sealed Canco containers are delivered to the dairy.

AMERICAN CAN COMPANY

230 Park Ave., New York, N. Y.

JOURNAL OF MILK TECHNOLOGY

Official Publication of the

International Association of Milk Sanitarians
(Association Organized 1911)
and Other Dairy Products Organizations

Office of Publication 374 Broadway, Albany, N. Y.
Entered as second class matter at the Post Office at Albany, N. Y., March 4, 1942.

(For complete Journal information, see page 306)

Volume 6 September–October, 1943 Number 5

CONTENTS

JOURNAL of MILK TECHNOLOGY

Volume 6 September–October, 1943 Number 5

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.

Annual Meeting Cancelled

Members of the Association of Milk Sanitarians:

Upon the receipt, by your Secretary, of a communication * from Mr. H. F. McCarthy, Director, Division of Traffic Movement, Office of Defense Transportation, for the cancellation of our 1943 meeting, the matter was brought to the attention of the Executive Board. After careful consideration, the Board decided to comply with the request of the Office of Defense Transportation. Mr. H. F. McCarthy has been advised of this action.

As you know, the papers which are presented at our annual meeting have always been published in the JOURNAL OF MILK TECHNOLOGY. The Association believes that the publication of these papers is a distinct advantage to all members, and also to the industry as a whole. This year we will not have access to this material. However, the Editor of the JOURNAL OF MILK TECHNOLOGY, and your Secretary, request that you do all that is possible to secure appropriate papers for publication in the JOURNAL. In the past our annual meeting has been a more or less rallying point for the work of the Association, and has also been a stimulus to future work. This year we must rely upon the JOURNAL to accomplish those things which were heretofore brought about by the convention. The cancellation of the annual meeting will in no way lessen our interest in the Association, nor will it detract from the value of the Association.

The Executive Board believe that you will wholeheartedly concur in its decision. We all will look forward to 1944, knowing that we will be able to get together, for the armed forces and the home front are doing a job which will be finished by then.

Sincerely,

C. S. LEETE,
Secretary

August 3, 1943

* See page 308.

Pasteurization Not Proof Against Bad Handling

PASTEURIZATION, when it is properly applied and the milk subsequently properly handled, will kill pathogenic bacteria and make milk safe. That its effects may be vitiated by improper handling of milk before and after pasteurization has been well demonstrated in two recently reported outbreaks of illness traced to pasteurized milk.

In the March-April issue was a report of an outbreak of food poisoning apparently due to *Staphylococcus aureus* toxin in pasteurized milk. The evidence indicated that the milk had contained staphylococci and that enterotoxin had been formed when the milk, before being pasteurized, instead of being properly cooled, was allowed to stand over night at room temperature. The pasteurization presumably destroyed the staphylococci but not the toxin, which is relatively heat-resistant.

An outbreak of 23 cases of streptococcus ("septic") sore throat among staff members and employees of a large general hospital in a city in New York State again demonstrates that pasteurized milk, like any other, may be contaminated after pasteurization through handling by infected persons.

About half of the victims of the infection lived outside the hospital but all had eaten meals in the hospital dining rooms. Onsets were between May 20 and 25, inclusive. One person had eaten only one recent meal at the hospital, namely the noon meal on May 20th. Another had been absent for some time and returned to eat her meals starting the evening of May 19th. Onsets were two days later in both instances. The victims were employed in different parts of the hospital and milk was the only food common to all.

The hospital ordinarily received daily, from a large milk company, from 12 to 15 forty-quart cans of pasteurized milk, plus a can of cream and some homogenized milk for use in special diets. The milk was received in the early afternoon and placed immediately in a special refrigerator. One man transferred this milk to smaller metal containers in which it was distributed to various parts of the hospital, most of it through several sub-stations, each equipped with a refrigerator. The smaller containers were washed at the sub-stations before being returned to the central station. Occasionally they are re-washed by the man at the central station. There was evidence of inadequate cleaning.

Apparently members of the house-staff had access, during the night, to the cans in the central refrigerator. It appeared, too, that during the hours when the regular milk-handler was off duty, other employees obtained milk from the cans as needed. Also, after delivery to the substations, the milk usually was poured first from the covered containers in which it was delivered to service pitchers and from these into glasses for serving. There was ample opportunity at several points, therefore, for contamination.

The man who handled the milk at the central refrigerating and distributing station gave no history of having had sore throat or other upper respiratory infection during the month preceding the outbreak. However, examination of a culture from his throat revealed hemolytic streptococci of Lancefield's

Group A, found also in cultures from throats of patients. Further typing of cultures was being undertaken at the time of writing. No streptococci of the Lancefield's Group A were found in milk samples taken at the time of investigation but presence of colon bacilli suggested contamination following pasteurization.

On the basis of circumstantial evidence this outbreak was milkborne. The small number of cases, considering the large amount of pasteurized milk used daily at the hospital, and the fact that the cases of infection were limited to staff members and employees eating in hospital dining rooms, there being no known cases among hospital patients, strongly suggests direct contamination in the handling of some of the milk by a milk handler. The man at the central station, during the investigation, was said to have been observed pouring milk from a forty-quart can with his thumb inside the rim of the can and milk flowing over his thumb. This, with the laboratory finding, is enough to warrant the suspicion that he was the source of infection.

P. B. B.

Stephen Moulton Babcock

In Commemoration of the Centennial of His Birth

IT may be wise on the centennial of the birth of Stephen Moulton Babcock to think of the inspiration that all of us may secure from his life.

He was born in the small village of Bridgewater, New York, on October 22, 1843. When he graduated from Tufts College in 1866 his record as a student was not very impressive. Present day personnel men for large companies would probably have passed him by. He pursued his studies in science at the Rensselaer Polytechnic Institute and in 1875 became an Instructor in Chemistry at Cornell University. Young Babcock must have had a great desire to learn for he studied chemistry at the University of Goettingen and received the Doctor's degree in 1879. Then he returned to New York to become chemist at the New York Agricultural Experiment Station. Here he began studies on the churning of cream, the viscosity of milk and cream, and the analysis of feeds. In 1888 he became Professor of Chemistry at the University of Wisconsin where he remained until his death in 1931. Surely this is the usual career of a college professor yet he became recognized as one of the great public benefactors.

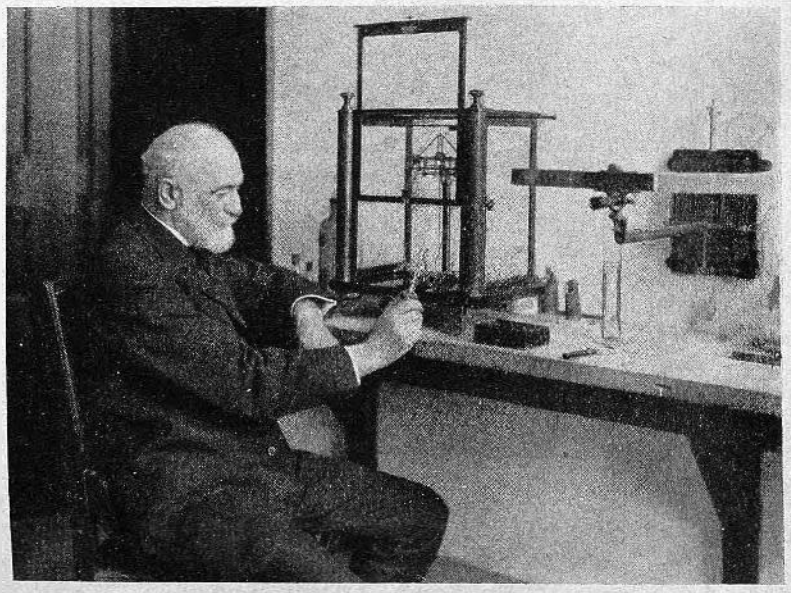
We know Dr. Babcock as the originator of the Babcock test which profoundly improved agricultural science and practice. How many of us realize that Dr. Babcock himself considered the development of this test as a rather insignificant scientific effort even though the test itself is so important. The Babcock milk test bottle and sulphuric acid for use in the test were experimentally used before his studies began. He adjusted the strength of the acid with water, used a centrifuge to bring the fat up into the neck of the bottle, and the test was soon practical to test all milk samples for their milkfat content. It is true

that he did develop a pipette to measure the milk instead of weighing it and he made other contributions but his notable developments that made the test work were standardization of the strength of the sulphuric acid and the centrifuge. It sounds simple now; in fact any one of us could have done it, but we must never forget that some of the greatest discoveries in knowledge and invention are the very simple facts whose extreme simplicity makes them great.

The importance of the Babcock test has overshadowed some of his more profound researches. He was one of the first to apply scientific procedures for determining viscosity of milk and cream. He found that incipient churning of the agglutination of the fat globules in cream affected viscosity, and that pasteurization produced its effect through this means. He discovered that the enzyme galactase as a constituent of milk was a factor in ripening cheese. It is studies of this type which Dr. Babcock realized required more basic research than the test that bears his name, yet it is especially fitting that he became famous for a simple procedure that was so important to the dairy industry.

Dr. Babcock viewed many complicated scientific problems with a simplicity that looked through them. Many problems of nutrition were given intense thought and study even though he is not known as a nutrition chemist. As President of the American Association of Official Agricultural Chemists he reminded them that if they analyzed coal by the approved procedures it would be found to be a good food. He reminded nutrition chemists that with all their knowledge none of them could compound a food as good as milk. When one considers that these simple thought analyses of the problems were made before the days of vitamins and small animal experimentation in nutrition, it becomes evident that he visualized the shortcoming of the old nutrition investigations.

Even in his last years Dr. Babcock retained his interest in and enthusiasm for the common things of life. He liked to visit with his fellow workers and to swap stories with them. His hearty laughter always showed when he was in the laboratory or the office with friends. His advice was sought and freely



given. The thrill that he secured from watching good games of sport was not generally known.

Many things made the greatness of Dr. Babcock. Surely the research that made the Babcock test was not involved even for 1890. A man who can develop a test of such practical importance, receive honors and recognition from all over the world, and still remain himself with absolute modesty and without trace of egotism is a great character. He even frowned upon the thought of exploiting a patent on the procedure. A man who can go through college as a mediocre student and become a great scientist of international reputation is a great student in spite of his college record. A man who can secure his pleasures and satisfactions from the simple personal associations and activities of life while his name becomes famous has learned the meaning of true happiness and accomplishment. Agricultural science and the dairy industry have been enriched by the life and works of Stephen Moulton Babcock but his character and accomplishments are an inspiration, a hope, and a lesson in life to all of us who are not born geniuses and who must strive in a simple manner to do our bit in our little way to add to the total of knowledge and happiness in this world. Who knows—perhaps some apparently simple contribution may become a great truth or invention for the service of mankind.

A. C. DAHLBERG

Food Control Through Education

THE official regulation of the conditions of milk production and handling has resulted in this branch of the food industry forging far ahead of other branches which are not so supervised. Of course, not all of this advanced development has been brought about by the inspectors. Much of it has been done by the industry, either the milk producers and dealers or the supply men. The experiment station research staffs have made their notable contributions. But regulatory pressure has catalyzed—or even possibly spearheaded—these developments.

Increasingly, these three groups are participating in cooperative studies. Equipment design and performance have reached such a high stage of development that further advances require careful study of numerous factors, usually requiring the combined efforts of a group of investigators. In the intimacy that cooperative studies foster, each group has learned to appreciate the points of view and objectives of the other groups. In general, each group has perceived that the others are composed of men with just as good motives and with just as high ideals and with just as trained an intelligence as any of them. Specifically, this has tempered regulatory tendencies as well as stimulated inventiveness and public health-mindedness in the industry. Nowadays, every self-respecting milk control official will think twice and often consult the industry before he promulgates new regulations. He accomplishes three valuable results: he saves himself many a later headache, he inspires the industry to criticize its own performance, and he builds permanence and effectiveness into his regulatory structure. The regulatory people are being educated.

As officialdom has come to recognize these developments, it has been doing an even better job than it did in the earlier trail-blazing days. The possibilities of food contamination and infecton are more numerous now than ever before, and are becoming increasingly so. These possibilities are being attacked along

two lines: improvement in food plant operations and educaton of food-handlers in the proper sanitary procedure in food production and distribution. New plant installations are adopting the sanitary features learned in the milk industry. Some types of equipment are being lifted over bodily from the milk industry into the general food industry.

Particularly noteworthy is the trend of health departments to provide courses of instruction for food handlers. For some years past, numerous classes have been organized for the instruction of employees engaged in milk pasteurization. Sometimes, these programs have eventuated into the requirement that this important occupation be placed under official license, restricted to trained operators. Instruction has broadened to meet the needs of the general milk plant operators. Also, dairy farmers are being increasingly instructed.

Now we see the program being expanded to reach the food industry as a whole. Numerous communities throughout the nation have established formal classes of instruction for food-handlers. One state sponsors such a program, but most are conducted by municipalities. The latest to join this group on a large scale is New York City. On the basis of the good work done in other communities, this City developed a program that combines most of the good features of all the others, and then has expanded it into a really unique program of instruction applicable to the whole food industry. By tieing it into food technology and plant operations (especially production), it secured the financial support of the Engineering, Science, and Management War Training program of the U. S. Office of Education.

The City found that the responsible men and women in food production plants are eager to learn the principles of good operation—good in the sense of sanitation as well as technology. Really, both go hand in hand. The instructors found that the classes were so interested in the health aspects of food production that they could with difficulty force themselves to move on to the more technological aspects. The course extended over thirty-six hours. At its conclusion, insistent demands were made for advanced courses. The scope of the course is indicated by a manual written especially as a text reference for these students. A limited supply of these is available to responsible health officers, by writing to Professor C. J. Velz, Manhattan College, Bronx, New York.

As a result of working together over all these past years, on the problems of producing safe foods, there are now four powerful agencies united on this objective. First, we have the industry, awake to the fact that safe food and high quality food is good business, and also that such practice gives the man in the industry greater personal satisfaction. Second, the health officers find their job of protecting the public health so facilitated by the helpful cooperation they secure that their energies and facilities are freed to engage in the broad task of actually improving the public health. Third, the courts have upheld the doctrine of industrial responsibility, and are ably supporting the program of food sanitation. And fourth, the public has become increasingly food-minded in the broad aspects of nutritional value, sanitary safety, and attractive appearance and service. These salutary results show what can be done by recognizing the well-meaning of the other fellow, helping him to overcome his difficulties, and showing him how to do it. "Line upon line, precept upon precept; here a little, there a little. . ."—education.

J. H. S.

A Ropy Milk Outbreak Caused by a Theromoduric Micrococcus*

C. C. PROUTY

Division of Dairy Husbandry, Washington Agricultural Experiment Station, Pullman, Washington

ROPY MILK OUTBREAK

DURING the spring of 1942 the attention of this station was directed to an outbreak of ropy milk occurring in the pasteurized market milk of a distributing plant processing the milk from a number of dairy farms. The organism responsible for the ropiness was isolated from the finished product and also from the raw milk as delivered to the plant by one of the producers. Following the exclusion of the milk of the offending producer, no further trouble was experienced in the pasteurized product.

The ropy condition, however, proved to be extremely persistent at the producing dairy and subsequently proved to be a major factor in the owner's decision to discontinue dairying. While no opportunity was afforded to observe conditions on the premises of the dairy, several examinations were made of the herd milk during the following months. Usually the ropy condition was evident and when so the organism was readily isolated. On several occasions, samples from the individual cows were submitted for bacteriological examination when the ropy organism was not recovered from these samples. These few negative findings, however, do not preclude the possibility of this organism coming from the udder of one of the cows of the dairy herd. In their investigation of a ropy milk outbreak, Hammer and Cordes (2) found an organism, related in some of its characteristics to the organism isolated in this study, to be present in the udder of a cow of the dairy herd associated with the ropy milk outbreak. They named this organism *Staphylococcus cremoris-viscosi* which, at the present time, is known as *Micrococcus cremosis-viscosi* (1).

Several visits were made to the dairy farm by the district milk sanitarian in an attempt to determine the source of contamination. Advice was given relative to the proper grooming of the cows and to the use of chlorine and heat treatment of utensils, but without success in eliminating the trouble. Failure to respond to the application of these sanitary practices, together with the persistent nature of the trouble, would suggest the udder of some producing animal as a possible source of the organism, even though negative results were obtained during the few times that samples from the individual cows were examined.

The outstanding characteristics of this outbreak were the rapid development of ropiness in the milk accompanied by an abnormal flavor and odor, and followed by very active digestion of the curd.

NATURE OF THE ORGANISM

Studies showed the organism to belong to the genus Micrococcus and to possess the following morphological, cultural and biochemical characteristics:

Spheres: 0.8–1.5 microns in diameter, occurring singly, in pairs, tetrads, and irregular groups. Gram variable, although usually gram positive, nonmotile.

* Published as Scientific Paper No. 563, College of Agriculture and Experiment Station, State College of Washington.

Gelatin stab: Rapid infundibuliform liquefaction.

Agar Colonies: Small, circular, raised, entire, dirty white to slightly brown in color, definite zones of proteolysis of milk agar.

Agar slant: Heavy, viscid, opaque, raised, dirty white to slightly brown.

Litmus milk: Rennet coagulated, progressive decrease in pH to 5.7 at 72 hours, rapid proteolysis, heavy viscous growth, litmus not reduced.

Potato: Moderate growth, slightly brown streak.

Indol: Not formed.

Nitrites: Not produced from nitrates.

Starch: Not hydrolyzed.

Ammonia: Produced from peptone.

Acid; but no gas from dextrose, maltose, lactose, levulose, galactose, and glycerol. No action on sucrose, mannitol, salicin, xylose, raffinose, arabinose and sorbitol.

Aerobic:

Temperature relations: Optimum, 28–30° C. (82–86° F.) Minimum, 7° C. (45° F.) Capable of resisting pasteurization temperature in milk of 61.6° C. (143° F.) for 20–35 minutes.

Since the organism was isolated from pasteurized market milk as well as from the raw milk, studies were made of its resistance to heat in milk at 143° F.±0.5° (61.6° C.). The organism was cultured in milk for 24 hours after which inoculations were made into tubes of sterile milk. These were then heated in a water bath. Variations occurred from time to time in the thermoduric nature of the organisms. Some cultures of the organism treated in this manner survived an exposure period of 35 minutes while at other times an exposure period of 20 minutes rendered the organism nonviable. This thermoduric characteristic undoubtedly accounted for the presence of the organism in the commercially pasteurized product.

DISCUSSION OF RESULTS

In comparing the characteristics of this organism with the descriptions of the various species of the genus Micrococcus, included in Bergey's Manual (1), many similarities are found to *Micrococcus freudenreichii Guillebeau,* an organism frequently found to be associated with ropy milk outbreaks, particularly in Europe. Although certain differences occur they do not appear to be of sufficient magnitude to justify the inclusion of a new species at this time. However, the following differences do warrant attention: The organism isolated in this study is somewhat smaller in diameter, possesses the ability to produce acid from maltose, levulose, and galactose, and is unable to attack sucrose. Also it has a somewhat higher optimum growth temperature and the color of growth is characterized as dirty white or brownish white.

In its action on milk the organism causes rapid development of ropiness and rapid digestion of the curd. In this respect it is similar to *Micrococcus cremoris-viscosi.*

Of considerable significance is the thermoduric nature of the organism and its ability to grow at relatively low temperatures. Pasteurization alone, therefore, cannot be relied upon to eliminate the organism from the finished product. At the time of the ropy outbreak reported in this study, the milk was pasteurized in the forenoon, delivered to the consumers in the afternoon, and ropiness observed the following morning. Although the minimum growth temperature of the organism approaches or is slightly above the temperature of the mechanical house-hold refrigerator, milk frequently is exposed to increased temperature after its deliverey. Under such a condition, the organism isolated in this study is capable of rapid growth and the subsequent production of ropiness.

SUMMARY

A study was made of an outbreak of ropy milk occurring in commercially pasteurized milk from which an organism closely related to *Micrococcus freudenreichii* was isolated. The source of contamination was traced to a dairy furnishing milk to the pasteurizing plant. While no opportunity was afforded to make a detailed study of the conditions prevailing on the premises of the producing dairy, those methods of control that were put into effect proved ineffective in overcoming the ropy condition.

Outstanding characteristics of the organism isolated in this study were its ability to cause the rapid development of ropiness accompanied by the presence of an abnormal flavor and odor and followed by very active digestion of the curd. The organism was found to withstand a temperature of 143° F. (61.6° C.) for 20 to 35 minutes. This thermoduric character undoubtedly accounted for its presence in the commercially pasteurized product.

REFERENCES

1. Bergey's Manual of Determinative Bacteriology, 5th Ed., p. 253–254, Williams and Wilkins Co., Baltimore, 1939.

2. Hammer, B. W., and Cordes, W. A. An Unusual Outbreak of Ropy Milk. *J. Dairy Sci.*, 3, 291 (1920).

CONSOLIDATE DAIRY RESEARCH AT ITHACA

Announcement of the transfer of Dr. A. C. Dahlberg, head of the Dairy Division at the State Experiment Station at Geneva since 1921, to the Dairy Department at the College of Agriculture at Ithaca appears in the current issue of " Farm Research," a quarterly magazine published at Geneva. The move comes as the result of budgetary discussions extending over a period of years and involve the disposal of the dairy herd at Geneva, it is said. Dr. Dahlberg will continue the study of problems related to the manufacture of dairy products, a field in which he has specialized for many years.

Among the principal lines of work initiated by Dr. Dahlberg at Geneva were studies on the creaming of milk; viscosity studies on milk and cream; the properties of gelatine, particularly with reference to their use in ice cream; the texture of ice cream, sherbets, and ices and the freezing of fruit ice cream; the relative sweetness of different kinds of sugars; and the development of improved pasteurization technics with a study of the effect of pasteurization on the creaming of milk and on other properties.

Numerous studies on cheeses of various types were also carried on under his direction, with particular stress on modifications of procedures looking to the improvement of the quality of both hard and soft cheeses. Outstanding in his cheese investigations was the development of the so-called "Geneva" method for the manufacture of cream cheese. Protected by a public patent, this process is now widely used in the making of cream cheese with a saving of many hours in the operation and the assurance of a product of uniformly high quality. More recently studies have been made on the canning of cheese.

Doctor Dahlberg has also contributed much to a better understanding of the value of blood lines in the breeding of dairy cattle thru a study of the production records of the Station herd. He also used the herd for experiments on various management practices, such as two vs. three milkings daily, hand vs. machine milking, timing of machine milking to prevent injury to the cow and to save labor, and other studies.

Market Homogenized Milk in Philadelphia

BERNHARD SPUR

Milk Research Laboratory, Childrens Hospital of Philadelphia, Philadelphia, Pa.

THE processing of homogenized milk introduces into the milk plant new machinery which adds new complications to the usual task of producing a pasteurized milk of high sanitary standard.

For a judgment of the general standard of the market homogenized milk in Philadelphia and vicinity, such milk was submitted to a thorough examination in this laboratory once a month during a period of 8 months, covering the most difficult time of the year, the summer months. The specimens were purchased from the distributing platforms of the milk plants and the investigation of the milk samples included the following tests: 1. Bacterial count, 2. Babcock fat test, 3. Curd tension test and 4. pH determinations.

By courtesy of the city's Department of Public Health it was possible to calculate each individual dairy's percentile part of the total distributed homogenized milk.

DISCUSSION OF THE RESULTS

The results of the investigation are tabulated in Table 1 in thirteen columns for both A and B milks.

The butterfat content of A milks averaged 4.09 percent and that of B milks averaged 3.72 percent fat (columns 3 and 9). A single dairy No. XXVII showed the low average figures of 3.27 percent and 3.25 percent respectively for A and B milk.

Columns 4 and 10 show the pH determination with an average of 6.72 and 6.73 or practically identical values for A and B milks. This pH figure is quite normal for milk. Milk from two small dairies, No. XIX and XXIII (representing about 3 percent of total consumption) showed abnormal average pH values close to or even slightly over 7. It must be noticed that the pH values were registered in the last 6 months of the investigation and not in the two winter months—December and February. The abnormal pH values were associated with very low titer values as determined by titration with N/10 sodium hydroxide. Checking on the milk from the same dairies showed later normal values as soon as the cooler weather arrived in the fall. It is worth while to notice that the bacterial counts were satisfactory so that these adulterated milks would have escaped detection if only routine tests had been applied.

Columns 5 and 11 give the curd tension values. Average curd tension is slightly higher for A milk than for B milk with relative curd tension of 11.6 and 11.2 grams. Although in some parts of the country a milk with curd tension up to 20 grams is recognized as a soft curd milk, a well processed homogenized milk should have a curd tension at least below 15 grams. An average curd tension as is found in milk from dairies No. XXI (18.4) and XXVI (18.1) must be regarded as slightly too high, as the curd size of curds from such milk will easily turn out to be too large.

The bacterial counts are registered in columns 6 and 12. The dairies have been arranged in the table according to increasing bacterial content in A milks. From a sanitary point of view the counts on the majority of both grade A and B milks were very satisfactory. This can be seen by

TABLE 1

HOMOGENIZED MILK IN PHILADELPHIA

Averages from December, 1940, February, April, May, June, July, August, September, 1941

	A Milk						B Milk					
1	2	3	4	5	6	7	8	9	10	11	12	13
Dairy	No. of tests	Butter fat	pH	Curd tension	Bacteria count	Percent of total milk consumed	No. of tests	Butter fat	pH	Curd tension	Bacteria count	Percent of total milk consumed
I	2	4.20	6.69	13.2	115	..	2	3.98	6.69	12.8	225	..
II	8	4.22	6.67	10.3	290	4	8	3.73	6.69	11.4	536	3
III	8	3.95	6.69	11.5	300	..	..	....	....	....	....	..
IV	8	3.95	6.71	13.3	310	2	8	3.55	6.76	14.3	823	under 1
V	8	4.15	6.71	10.8	365	under 1	8	3.60	6.73	10.4	1,324	"
VI	6	4.20	6.70	14.9	395	..	6	3.69	6.71	12.7	983	..
VII	8	4.15	6.68	14.1	516	15	8	3.72	6.70	12.2	870	15
VIII	8	3.78	6.67	12.4	612	..	..	....	....	....	....	..
IX	8	4.00	6.68	6.9	723	under 1	8	3.57	6.71	6.9	1,065	1
X	8	4.04	6.71	10.4	760	"	8	3.53	6.72	9.6	1,655	under 1
XI	8	4.40	6.72	9.0	911	15	8	3.91	6.71	9.2	2,265	18
XII	8	4.17	6.72	12.1	928	11	8	3.69	6.73	12.4	3,702	5
XIII	8	4.12	6.70	9.8	1,134	9	8	3.74	6.70	9.7	1,355	9
XIV	..	....	....	....	....	..	8	4.44	6.71	15.9	1,152	5
XV	8	4.10	6.72	10.6	1,236	3	8	3.75	6.71	9.9	1,655	3
XVI	8	4.38	6.72	15.1	1,300	23	8	3.97	6.72	13.3	1,381	18
XVII	8	4.08	6.72	12.8	1,335	3	8	3.61	6.72	11.9	3,663	3
XVIII	8	4.10	6.70	12.1	1,816	2	8	3.68	6.71	9.6	3,450	3
XIX	8	3.98	7.07	5.3	2,979	under 1	8	3.63	7.11	4.6	965	under 1
XX	8	4.08	6.72	12.3	3,513	3	8	3.69	6.72	12.4	4,575	5
XXI	8	4.13	6.67	18.4	4,018	under 1	8	3.70	6.68	16.4	18,200	under 1
XXII	7	4.14	6.69	12.2	4,704	"	7	4.03	6.69	11.7	6,031	"
XXIII	8	4.12	7.01	8.0	5,623	3	8	3.53	6.97	10.6	4,279	3
XXIV	8	4.20	6.71	11.3	5,725	under 1	8	3.64	6.72	10.5	11,063	2
XXV	3	3.91	6.72	14.3	6,537	..	2	3.67	....	15.0	2,590	..
XXVI	8	4.43	6.70	18.1	7,231	under 1	8	3.69	6.70	14.3	10,191	under 1
XXVII	8	3.27	6.74	11.9	14,875	"	8	3.25	6.70	10.9	17,625	"
XXVIII	8	4.15	6.70	10.6	15,338	"	8	3.53	6.69	9.5	11,681	"
XXIX	2	4.50	6.69	6.7	17,150	"	2	3.75	6.70	8.5	22,900	"
XXX	4	4.17	6.69	12.5	17,175	"	4	3.58	6.72	8.4	36,850	"
XXXI	5	4.14	6.71	9.4	21,530	"	5	3.80	6.71	9.5	21,400	"
XXXII	8	3.95	6.70	10.1	29,988	"	8	3.60	6.75	9.8	37,613	"
XXXIII	8	4.09	6.69	12.3	30,738	"	8	3.85	6.70	10.9	18,238	"
XXXIV	8	4.08	6.69	10.6	48,475	"	8	3.88	6.70	12.5	55,575	"
XXXV	..	....	....	....	....	..	7	3.64	6.72	11.8	144,571	"
XXXVI	..	....	....	....	....	..	8	4.15	6.70	14.6	947	under 1
Averages		4.09	6.70	11.6				3.72	6.71	11.2		

looking at the figures in columns 7 and 13. A line drawn below dairy XVIII in the A milks separates all A milks with bacterial counts below 2000 per cubic centimeter. These fine results represent 88 percent of the milk consumed on the market or by far the most milk consumed at all. For the B milks, 85 percent of the milks consumed showed bacterial counts below 4000 per cubic centimeter. The conclusion is that the greater part of homogenized milk is distributed by dairies with fine sanitation records.

Table 2 shows the milk consumed according to the bacterial count. The result is very good—one would almost say amazingly good. Only for the B milks we have a few exceptions with really high average bacterial counts, but these milks represent a very small part of the total consumption.

A question often raised in connection with homogenized milk is whether pasteurization before homogenization

TABLE 2

PERCENTAGE OF TOTAL HOMOGENIZED MILK CONSUMED, ARRANGED ACCORDING TO BACTERIA CONTENT IN THE MILK

Averages from April to September 1941 Inclusive

A Milk		*B Milk*	
Bacteria	*Percent milk consumed*	*Bacteria*	*Percent milk consumed*
Between 100– 1,000	49	Between 100– 1,000	30
" 1,000– 2,000	40	" 1,000– 2,000	39
" 2,000– 8,000	7	" 2,000– 8,000	20
" 8,000–30,000	3.8	" 8,000– 30,000	7
" 30,000–50,000	0.2	" 30,000– 60,000	3.9
		" 60,000–150,000	0.1

is to be preferred to pasteurization after homogenization. As the homogenizing process is flavor-correcting (1)—meaning that the process tends to conceal the slightly cooked flavor brought about by higher pasteurizing temperatures—dairies like to homogenize later. Another reason for homogenizing last is that heating of milk counteracts the result achieved by the homogenization, in bringing together again some of the fat globules just divided and broken down into smaller units. This often produces fat plugs on top of the milk bottle. The argument against using homogenization as the final process is a sanitary one. It is believed by some sanitarians that the possibility of bacterial contamination in the homogenizer is a danger to the production of a bacterially safe milk. This point of view has been supported by observation of early models of the homogenizer which were difficult to clean. Since then improvements in simplicity of construction have made it much easier to keep homogenizers clean. This in connection with increased feeling of responsibility displayed by the dairy plant operators has practically eliminated any objection against homogenizing as the final operation before the bottling of the milk.

It was known that dairies No. I, II, VIII, IX, X, XII, XIII, XIV, XV, XIX, XXI and XXXVI pasteurized before homogenization while dairies No. VII, XVI and XXVIII were known to pasteurize after homogenizing. It is interesting to note that of these mentioned dairies, No. XXVIII, belonging to the homogenization-pasteurization group had the highest bacterial counts and that the lowest bacterial counts were found in No. I and II, belonging to the pasteurization-homogenization category. This indicates that the question of getting milk low in bacterial content is dependent more upon sanitary conditions in the dairy plant than upon the order of the processes, pasteurization and homogenization, and furthermore that these sanitary conditions are actually produced in plants distributing most of the homogenized milk consumed in Philadelphia.

SUMMARY

A review of market homogenized milk in Philadelphia during eight months covering the summer months of 1941 showed satisfactory sanitary conditions, measured by bacterial counts, in 96 percent of A milks and 89 percent of B milks, consumed. Exceptionally high standard was found in 89 percent of A milks and 65 percent of B milks consumed.

ACKNOWLEDGMENT

I wish to express appreciation to Dr. I. J. Wolman for helpful suggestions during the progress of this study.

REFERENCES

1. Spur, Bernhard. The Relationship Between the Temperature of Pasteurization (holding method) and the Appearance of Cooked Flavor in Homogenized Milk. *J. Milk Tech.*, **6**, No. 2, March-April, 1943.

Heat Resistant Organisms in Milk Supplies*

W. D. DOTTERRER

Director of Laboratories, Bowman Dairy Company, Chicago, Illinois

HEAT-RESISTANT or thermoduric bacteria are common in a great many milk supplies. Their numbers in samples from different areas may vary from a few to as many as 100,000 or more per ml. There is also a great variation in numbers from the same area at different times, as a sample may at one time be heavily seeded and a short time later another sample from the same supply be nearly free from them. The same variation occurs in the case of individual farms. There are some areas that consistently furnish more than their share of trouble from thermoduric organisms. Other areas in the same milk shed seldom cause trouble. A pecularity of heat-resisting bacteria is that they are often more numerous in the cooler months of the year. The reason for this is not clear. It may be because of less competition from other types of organisms or it may be due to less care in cleaning and sterilizng utensils in cold weather. It is a common occurrence in sections where heat-resistant bacteria abound to find higher counts in pasteurized milk in the winter months than in the summer. Counts on samples of raw milk from the same supply will generally be higher in the warm months.

The immediate source of most of the thermoduric bacteria in milk supples has been found by a number of investigators to be farm utensils. It is generally agreed that milking machines are the most common source. Macy (1) in 1938 states that "The information at hand regarding the sources of these thermoduric types indicates clearly that, aside from occasional faulty sanitation or inefficient pasteurization within the processing plant, the major factor in high counts in pasteurized milk is the presence of excessive numbers of heat-resistant types in raw milk as produced and delivered from the dairy farm." The original source of the heat-resistant bacteria may be the soil or dust in some cases, but the cow's udder no doubt often supplies them. It has been shown by Harding and Wilson (2) and by Alice Breed (3) that more than 40 percent of udder micrococci are heat resistant. Improperly sterilized utensils, especially milking machines which contain sufficient material to support growth, will produce large numbers of the organisms to contaminate milk which comes in contact with them. In addition to the micrococci there are some streptococci which withstand pasteurization. Spore-forming organisms could be included in the list, but they are probably not often found in sufficient numbers to be troublesome. Hofer (4) found that a majority of thermoduric organisms were micrococci, except for a few short periods when streptococci predominated.

INCREASE IN COUNTS

There has seemed to be an increase in the number of high counts due to thermoduric organisms in the last few years. The adoption of a more favorable medium in July, 1939, is undoubtedly one of the reasons, although differences between the old and the new media are not always great. In our laboratory, high counts caused by thermoduric bacteria were becoming increasingly common several months before the adoption of the new medium. It was shown as early as 1922-23 (5)

* Presented at St. Louis meeting of the American Public Health Association, October 26, 1942.

that heat-resistant organisms may be an important factor in high counts in pasteurized milk. At that time milking machines were not so common, and it was easier to demonstrate satisfactory methods of control. With one or two machines involved the problem was much simpler than with 100 or more. The increased use of milking machines has complicated the job of proper cleaning on the farm and increased the number of thermoduric bacteria in milk. Short-time high-temperature pasteurization will generally give higher counts than the low temperature 30-minute holding method. However, in the experience of one dairy company, the percentage of high counts due to heat-resisting bacteria has been about as high with the holding method as with the short-time method. Hileman (6) has published a comprehensive paper comparing the two methods of pasteurization and identifying the most common organisms found. He found higher counts in milk pasteurized by the short-time method than in that pasteurized by the holding method.

There is another possible reason for the increase in thermoduric organisms. With the adoption of the so-called Standard Ordinance in many cities the custom of storing clean utensils outside the milk house was abolished and it required that the utensils be kept in the milk house. There is less circulation of air inside and no direct sunlight. The utensils do not dry as quickly and therefore are in condition to promote bacterial growth for a much longer time. In some cases they will not dry before the next use. How much this change affects bacterial numbers is open to question, but the possibility is evident and some investigation should be made to determine the effect of this change in methods of storing utensils.

QUICKER METHODS OF DETECTION

Several methods for the detection of heat-resistant organisms have been proposed. Laboratory pasteurization followed by standard plate counts is one method. In case a supply shows a high count the next step is to pasteurize samples from the individual producers. It is at this point that the use of the standard plate count becomes burdensome and expensive. To overcome these difficulties several modifications have been used. Myers and Pence (7) used tubes instead of plates for their cultures and secured satisfactory results. In our laboratory standard plates are poured and the medium allowed to harden. Using a 1/1000 ml. loop, the samples are streaked 5 to the plate on the agar and incubated as usual. This method saves time and material and is accurate enough to distinguish the high counts. Mallman, Bryan and Fox (8) held samples at 60° C. for two hours and examined them with a microscope. Fisher and Johns (9) have made comparison of the various methods and conclude that the Myers and Pence (7) method is most satisfactory. They did not try the plate streak method.

ELIMINATION OF THERMODURICS

The elimination of all thermoduric organisms from a milk supply requires careful and constant cleaning and sterilization of all dairy equipment. This applies to the pasteurizing plant as well as to the farm. The plant cleaning problem is not so difficult to handle, since there are practically always adequate facilities for the work. It is not easy to provide proper cleaning facilities on the farms, especially in cold weather. In spite of the physical difficulties in the way of proper care of farm utensils, the greatest problem is to get the producer to understand the need for such great care. The farmer who is not trained in bacteriology can see dirt in his utensils but he cannot see the bacteria which remain after the utensil appears clean to sight and feel. Large numbers of bacteria may remain on the surfaces of equipment which looks clean, particularly if the surfaces are wet.

UNIMPORTANT EMPHASIS

It is fortunate that the heat-resistant organisms commonly found in milk are not pathogenic. Breed (10) suggests greater emphasis "on the extension of pasteurization as a blanket means of protection against milk-borne diseases and upon the eradication of diseases that may be transmitted to human beings from our producing herds" before spending "an undue amount of energy and valuable time in getting some harmless types of bacteria out of our milk supplies. These bacteria are usually detected only because of the fact that they are difficult to kill during the pasteurizing process."

It appears that the greatest damage done by the heat-resistant bacteria is to our vanity. All of us, milk dealers and health officials, have been priding ourselves on low bacteria counts in milk. While this is a commendable attitude, it is just possible that there are other more important aspects of milk sanitation to be considered. The above comments are not meant to minimize the necessity of cleanliness and sanitation, but simply to call attention to the possibility of misplaced emphasis which could creep into the milk safety program. This is of particular importance now when there is, or threatens to be, an acute shortage of farm labor.

SUMMARY

Heat-resistant or thermoduric bacteria are common in a great many milk supplies. There has been an increase in heat-resistant bacteria in the last few years, perhaps due to several reasons:

1. The use of a medium favorable to their growth;
2. The increased use of short-time high-temperature pasteurization; and
3. Perhaps changes in the method of caring for utensils on the farm.

The immediate source of thermoduric organisms in milk has been found generally to be farm utensils. Milking machines have been involved more often than other equipment.

A majority of thermoduric bacteria in milk are micrococci, many of which probably come originally from the cow's udder. Some streptococci are also heat resistant.

Elimination of heat-resistant bacteria from milk supplies requires great care in cleaning and sterilizing utensils.

Education of milk producers to the importance of proper care of utensils is the most practical method of control. The impending shortage of farm labor will add to the difficulty of attaining this object.

REFERENCES

1. Macy, H. High Bacterial Counts in Pasteurized Milk—Some Factors Involved. *The Association Bulletin,* Intern. Ass'n of Milk Dealers, No. 8, March, 1939.

2. Harding, H. A., and Wilson, J. K. A Study of Udder Flora of Cows: *N. Y. (Geneva) Agr. Exp. Station, Tech. Bul. 27,* 1913.

3. Breed, Alice. Micrococci Present in the Normal Cow's Udder, *Ibid., 132,* 1928.

4. Hofer, J. W. Unpublished Date from the Bowman Dairy Co. Laboratory, Chicago, 1941–42.

5. Dotterrer, W. D. Some Observations on High Counts in Milk Freshly Pasteurized Under Commercial Conditions. *Intern. Ass'n Dairy and Milk Inspectors, 12th Ann. Report, 1923.*

6. Hileman, J. L., Leber, Henry, and Speck, M. L. Thermoduric Bacteria in Pasteurized Milk. II. Studies on the Bacteria Surviving Pasteurization with Special Reference to High-Temperature Short-Time Pasteurization. *J. Dairy Science,* 24, 305 (1941).

7. Myers, R. P., and Pence, J. A. A Simplified Procedure for the Laboratory Examination of Raw Milk Supplies. *J. Milk Tech.,* 4, 18–25 (1941).

8. Mallman, W. L., Bryan, C. S., and Fox, W. K. New Microscopic Procedure for the Detecting and Locating of the Source of Thermoduric Organisms in Milk. *Ibid.,* 4, 195–199 (1941).

9. Fisher, J. B., and Johns, C. K. A Comparison of Various Methods for Detecting Thermoduric Bacteria in Milk. *Ibid.,* 5, 269–275 (1942).

10. Breed, R. S. The Whence and Whither of Milk Sanitation. *Canadian Public Health Journal,* p. 422, Sept., 1940.

The Nitrogen Distribution in Dried Milk[1]

U. S. Ashworth and Harris O. Van Orden[2]
Division of Dairy Husbandry, Agricultural Experiment Station, Pullman, Washington

During an investigation of the baking quality of dried skim milk it became desirable to know whether the nitrogen distribution differed from that of normal fresh skim milk. The samples analyzed were made by the spray process.[3] Most of the milk had been preheated before drying. The samples were stored in sealed containers at just above freezing temperature.

The methods of analysis were mainly those of Rowland (1) and Menefee *et al.* (2). The samples for each determination were weighed out in the dry form, reconstituted with ten times their weight of water, and allowed to stand about one hour before the analysis was continued. In order to increase the accuracy, macro methods were used for both total nitrogen and non-casein nitrogen. For the determination of non-casein nitrogen the method of Rowland (1) was followed except that 2.5 gm. of the dried milks were weighed into 250 ml. volumetric flasks and 200 ml. of the filtrates were used for the nitrogen determination by the regular macro Kjeldahl method. The albumin-plus-globulin fraction was determined by difference after repeating the non-casein nitrogen determination on milk which had been reconstituted and heated for 20 minutes on boiling water bath.

Ammonia was determined by the method of Perkins (3). Sodium borate was used by us in place of magnesium oxide because we had better recovery of added ammonia.

Discussion of Results

A summary of the results calculated to a moisture-free basis is shown in Table 1. These values agree well with those in the literature for fresh skim milk with the exception of the albumin-plus-globulin fraction and consequently the casein fraction. Out of the 32 samples investigated only four of them had measurable amounts of albumin-plus-globulin and the maximum value found represented only 4.1 percent of the total nitrogen. This variation in the amount of heat-coagulable protein found is no doubt associated with variations in the

TABLE 1

Summary of Nitrogen Distribution Values

Mg. nitrogen (N) per gm. of dry milk solids on a dry matter basis

	No. of Samples	*Mean*	*Standard Error, S $\bar{x}$*	*Range*		*Percentage of Total N*
Total N	32	58.13	0.13	55.4	59.3	....
Casein N	32	52.8	.18	51.9	54.0	90.75
Non-casein N (before heat)	32	5.50	.094	4.94	7.41	9.25
Non-casein N (after heat)	32	5.34	.0453	4.85	5.78	....
Albumin + globulin N	32	0.23	.....	0	2.14	.40
Proteose peptone N	30	2.30	.046	1.6	2.8	3.95
Non-protein N	30	3.06	.14	2.8	3.3	5.26
Ammonia N	8	0.11	.006	.09	0.12	0.16

[1] Published as Scientific Paper No. 551, College of Agriculture and Agricultural Experiment Station, State College of Washington, Pullman, Wash.
[2] American Dry Milk Institute Fellow, 1940–41.
[3] Samples kindly furnished by the Consolidated Dairy Products Company, Seattle, and the American Dry Milk Institute, Chicago.

heat treatment that these samples received preceding the drying operation.

An attempt was made to determine globulin separately by the method of Rowland (1), but since small and variable amounts were found to be present even in those samples which showed no presence of heat-coagulable protein we agree with Menefee *et al.* (2) that the accuracy of the method for globulin is not great enough for these small amounts. Therefore the values for globulin nitrogen alone are not included in the table.

BIBLIOGRAPHY

1. Rowland, S. J. The Determination of the Nitrogen Distribution in Milk. *J. Dairy Res.*, 9, 42 (1938).
2. Menefee, S. G., Overman, O. R., and Tracy, P. H. The Effect of Processing on the Nitrogen Distribution in Milk. *J. Dairy Sci.*, **24**, 953 (1941).
3. Perkins, A. E. Determination of Ammonia and Urea in Milk. *Ind. and Eng. Chem. Anal. Ed.*, **10**, 69 (1938).

STEENBOCK'S VITAMIN D PATENTS INVALID

The Steenbock patents covering the production of vitamin D by irradiation of foods with ultra-violet light, and assigned to the University of Wisconsin Alumni Research Foundation, have been held invalid by the Federal Circuit Court of Appeals.

The patents were originally upheld in the District Court in Los Angeles, but Vitamin Technologists, Inc. appealed to the Circuit Court of Appeals. Judge Denman, who wrote the opinion, held that:

"Primarily it is to be noted that the claim applies to all ultra-violet rays. It is not confined to such rays as are produced by a particular medium, such as the quartz lamp. It includes, of course, the ultra-violet rays of the sun.

"Many years before the application, science had discovered that the sun's rays shining on cut alfafa hay cured in the field was an antirachitic food for pigs.

"Steenbock himself verified the facts concerning alfafa by the discovery that when cured out of the sunlight it lacked the antirachitic quality exerted when cured in the field.

"We thus have the inventor proving that it is from the ultra-violet rays of the sun that the alfafa acquires its vitamin D, that is, by the process claimed by him as patentable.

"If the patent be valid, it is thus seen that the farmer is an infringer when he exposes his cut alfafa to the ultra-violet rays of the sun long enough to make it antirachitic.

"So also the long previously established practice of the radiation of milk by the mercury vapor lamp would infringe the monopoly of Steenbock's patent because, admittedly, in its customary use it would produce in the milk vitamin D."

The Court pointed out that Hume and Smith had discovered that rachitic rats improved in health when they were put in a cage, the floor of which was covered with sawdust treated with ultra-violet rays from a mercury vapor quartz lamp.

Steenbock discovered that this improvement was caused by the antirachitic quality of the sawdust that was eaten by the rats. However, the Court held that Steenbock did not invent a method, but merely discovered what had appeared in a previously known process.

Care of Milking Machines*

C. K. JOHNS

Central Experimental Farm, Ottawa, Canada

FEW problems are causing the milk sanitarian more concern than the insanitary condition of many milking machines. With the present critical shortage of farm help, milking machines are indispensable on many farms if milk production is to be maintained at present levels. The farmer is carrying a heavy load these days, and anything that the milk sanitarian can do to lighten that load without lowering the quality of the milk supply will be a real contribution to the farm end of the war effort.

There is certainly no dearth of published directions for the care of milking machines. With rare exceptions, any one of these methods will give satisfactory results if carefully followed. That so much trouble is being encountered suggests that many farmers are not following these directions. Why is this? It has long been my contention that most methods recommended are so laborious and time-consuming that the farmer immediately looks for short-cuts. Too often his short-cuts result in trouble. Another factor is that many farms lack facilities for supplying the large quanities of hot water called for in addition to the amounts required for washing the other dairy utensils. In our studies at the Central Experimental Farm, Ottawa (4, 5, 6, 7), we have sought to develop a method which would be so simple as to leave little temptation to short-cut, and which would maintain the rubber parts of the machine in good sanitary condition without the use of hot water after each milking. Such a method was finally developed in 1930, and has been in use ever since.

CLEANING PROCEDURE

There is little difficulty in maintaining the milker pail and pail-head in satisfactory condition by the same washing procedure used for other metal dairy utensils. It is the rubber parts that cause the trouble. Consequently, in the present discussion we shall concentrate on them. The first step in our method is to rinse off the bulk of the milk residue immediately after milking. While the vacuum pump is still running, at least two gallons of clear cold or lukewarm water are sucked through each unit, raising and lowering the teat-cups to obtain an air-brush effect. The outer surfaces of the milk tube system are then cleaned off with a brush and hot detergent, hung on a solution rack, and filled with a weak lye solution (0.5 percent). Just before the next milking the solution is drained out and the units re-assembled. We have not found it necessary to rinse to remove traces of the lye solution, although where a chlorine rinse is used to treat the metal utensils, it could advantageously be drawn through the milker units. We have omitted this final rinse because our aim has been to keep down to the bare essentials for maintaining the units in good sanitary condition.

At intervals varying between one and two weeks, the rubber parts are dismantled, mainly to prevent the rubber parts from adhering to the metal.

* Presented at the Annual Meeting of the International Association of Milk Sanitarians, St. Louis, Oct. 30, 1942. Contribution No. 161 (Journal Series), from the Division of Bacteriology and Dairy Research, Science Service, Dominion Department of Agriculture, Ottawa, Canada.

The tubes and liners are inspected and brushed in hot detergent solution, rinsed, and re-assembled. If necessary the liners are trimmed to the proper length at that time and replacements made as needed. (Incidentally, our liners last around 5 months with the above method.) The brushing of the tubes at this time is merely a carry-over from previous methods; it is not a "weekly cleaning" as some would call it. The rubber parts are perfectly clean from the combined clear water rinse and lye solution treatment described. The brushing could even be eliminated without affecting either the physical cleanliness or the bacterial content of the milk drawn through the machine.

In our studies, the check valves have not been found to contribute any significant numbers of thermoduric bacteria as reported by Parfitt (10). Nevertheless, keeping check valves in lye solution as he recommends is a good practice on the average farm.

Many will be inclined to challenge the statement that the rubber parts can be kept in good sanitary condition without at least a daily brushing in hot water, with or without added detergent. In fact, health departments are almost 100 percent in opposition to the suction rinse method of washing the machines. Is brushing really necessary? May I suggest for your consideration the method by which milk bottles are washed in many soaker type bottle washers. Here reliance is placed upon the hot caustic solution to clean and sterilize the bottle in a few minutes, without resort to brushing. In the lye solution method, we rely upon a weaker soak solution of caustic or lye to do the same work at room temperature. However, instead of having to do the job in a few minutes, the lye solution in the milker tubes has around eleven hours in which to do a much easier job, since the bulk of the milk has already been rinsed off. *The lye saponifies the butterfat and dissolves the casein, leaving the rubber parts physically clean.* In other words, the final cleaning is done by the alkali soak solution. This is obviously much simpler than taking everything apart and brushing with a hot detergent solution. Furthermore, no additional steps are necessary in the way of sterilization or storage between milkings. The lye soak solution is a good germicide and prevents the growth of bacteria in the tubes.

EFFECT OF NEGLECTING WATER RINSE

The objection has been advanced that the farmer will try to short-cut no matter how simple the method recommended. There is not only much less temptation to short-cut, but if he does there is less likelihood of his getting into trouble with the method outlined than with more laborious and time-consuming methods. This is borne out by the insanitary conditions frequently noted where the latter methods are called for. Furthermore, with the simplified method described, no great harm is done even if the farmer omits the clear water rinse occasionally. At one time we unintentionally ran for nearly 5½ months without the rubber parts ever receiving a clear water rinse or brushing! They came directly from the cows to the solution rack, then went back on the cows at the next milking. At the end of that time, when it became necessary to replace the liners, the rubber parts were entirely free from the slimy residue and the spongy, sticky condition generally found in machines that were poorly cared for. All we found was a deposit of calcium phosphate on the inner surfaces. This came from the milk residue, thrown out of solution by the alkaline reaction. Much to our surprise this condition was not reflected in higher bacteria counts in either the raw or pasteurized milk (7), despite the claim (8) that no chemical disinfectant will function when the surface to be disinfected is covered with such deposits. This is not to

say that rinsing is unnecessary; such deposits should by all means be avoided by a thorough preliminary rinse to remove as much of the milk residue as possible. It does, however, suggest that the simplified method described carries a wide factor of safety and is as nearly foolproof as any method can be expected to be.

It should be emphasized that the cold water rinse method described will not give the same results if a chlorine solution is used in the tubes in place of lye. As reported in 1932 (6), the use of either chloramine-T or hypochlorite solution results in an accumulation of semi-solid material in the tubes, even though the counts on milk drawn by machines so treated may be reasonably low. Chlorine solutions lack the detergent action of the lye solution. They may safely be used to keep down the growth of bacteria in the rubber parts only when these have first received a thorough cleaning to remove all milk residue.

RESULTS IN PRACTICE

The value of this method in maintaining reasonably low bacterial counts is indicated by the data in Table 1. It will be observed that over 70 percent of the 1,232 counts were below 10,000 and 95.8 percent below 50,000 per ml. These represent counts on samples of mixed night's and morning's milk taken from the pasteurizing vat at the start of pasteurization, and thus represent contamination from a number of sources in addition to the milking machines. Furthermore, the poorer record during 1932 is largely due to the fact that other, less adequate, methods of caring for milking machines were being tested out during this period. If there were any flaws in the simplified method described, they should certainly have shown up in the 2,464 milkings represented by the data in Table 1. At the University of Wisconsin, the same method, except for the use of an additional clear water rinse at the start of milking, has been in use since 1931 with excellent results (1, 2, 3). The same is true for a number of farms all over the continent. Rogers and Evans (11) have reported excellent results when the unit, rinsed in cold water, was immersed between milkings in a 5 percent solution of trisodium phosphate. We have also used both tri-

TABLE 1

DISTRIBUTION OF PLATE COUNTS OF RAW MILK

Central Experimental Farm—Ottawa, Ontario

Year	*<2,500*	*2,501–5,000*	*5,001–7,500*	*7,501–10,000*	*10,001–15,000*	*15,001–25,000*	*25001–50,000*	*>50,000*	*Total*
1931	3	17	31	20	21	18	5	4	119
1932	2	17	5	6	22	24	18	13	107
1933	3	16	17	14	18	13	15	8	104
1934	5	23	21	8	13	6	10	6	92
1935	8	31	18	12	17	8	8	3	105
1936	19	32	15	13	4	8	3	6	100
1937	20	37	13	8	5	11	4	4	102
1938	46	34	6	8	5	5	1	0	105
1939	35	53	12	2	1	0	0	0	103
1940	12	29	19	10	8	3	7	5	93
1941	23	63	14	7	1	4	0	2	114
1942 9 months	2	20	25	17	14	6	2	2	88
Grand Total	178	372	196	125	129	106	73	53	1,232
Percentage	14.4	30.2	16.0	10.1	10.5	8.6	5.9	4.3	100.0

sodium phosphate and Metso (sodium metasilicate) in place of lye with good results (5, 6).

The results presented indicate that milking machine rubber parts may be kept clean, and milk of reasonably low bacterial content produced, without the use of hot water and without disassembling and brushing once or twice each day. No claim is made that this is *the* best method of caring for the rubber parts. It may be that under certain conditions it will give results less satisfactory than those already referred to. If such is the case, we would be interested in learning the details, for in nearly ten years which have elapsed since this method was first described (6), no such failure has been reported in the literature. If not, then it must be asssumed that opposition to such simplified methods is based either upon prejudice or reluctance to discard previous ideas. *The important thing is the result, not the method by which this is achieved.* To require farmers to follow methods which are laborious and time-consuming, and which do not result in a significantly better quality of milk, is poor policy at any time. In these critical times it may well be regarded as definitely hindering the farm end of the war effort.

REFERENCES

1. Hastings, E. G., and Werner, Geo. *Wisconsin Agr. Expt. Sta. Circ.* 259 (1933).
2. Hastings, E. G. *Wisconsin Extension Circ.* 206 (1941).
3. Hastings, E. G. Personal communication, Oct. 8, 1941.
4. Johns, C. K., and Lochhead, A. G. *J. Hygiene,* 29, 35–50 (1929).
5. Johns, C. K. Unpublished data (1932).
6. Johns, C. K. *Sci. Agr.,* 13, 460–465 (1933).
7. Johns, C. K. *J. Dairy Sci.,* 24, 409–411 (1941).
8. Mallmann, W. L., Bryan, C. S., and Begeman, L. H. *Ibid.,* 23, 621–627 (1940).
9. Parfitt, E. H. *Purdue Agr. Expt. Sta. Bull.* 348 (1931).
10. Parfitt, E. H. *Ibid.,* 449 (1940).
11. Rogers, L. A., and Evans, F. R. *J. Dairy Sci.,* 19, 733–738 (1936).

CHERRY-BURRELL ANNOUNCES MANAGEMENT CHANGES

W. L. Cherry, President of the Cherry-Burrell Corporation, Chicago, has resigned that office, effective at the next Board of Directors' Meeting to be held October 15, 1943, to accept a position as Chairman of the Executive Committee. This decision was announced at the regular Board of Directors' Meeting, July 16th.

It is anticipated that at the next meeting of the Board of Directors, John W. Ladd, now First Vice-President of the Corporation, will be elected to the Presidency.

By similar action, H. H. Cherry, Vice-President and General Manager of the Corporation's manufacturing plant at Cedar Rapids, Iowa, will be elected First Vice-President.

The Board at its July 16th meeting also elected S. B. Berg, Secretary and Comptroller, and J. L. McIntyre, Treasurer, to membership on the Executive Committee. This committee has been increased from five to seven members. The other five members of the Executive Committee are: Loomis Burrell, Chairman of the Board; W. L. Cherry; John W. Ladd; H. H. Cherry, and E. W. Neumeister, Vice-President and General Manager at the Corporation's Manufacturing plant at Milwaukee.

The Function of the Laboratory in the Control of Milk Supplies*

F. W. FABIAN

Research Professor of Bacteriology, Michigan State College
East Lansing, Mich.

THE laboratory plays a secondary but important role in the drama of sanitary milk production. It is the hand maid of science assisting the veterinarian, the physician, and the dairy inspector. To produce clean wholesome milk, it is necessary to have clean healthy cows, intelligent as well as inherently clean labor, clean stables and utensils, and adequate cooling facilities.

During the years intervening since the laboratory first started to make routine bacterial analysis of milk, it became evident that the pathogenic bacteria causing the greatest amount of difficulty in milk supplies as well as in the dairy herds, were those causing tuberculosis, undulant fever, and septic sore throat. For this reason special tests, media, and procedures have been devised for detecting the presence of these organisms not only in the dairy herd but also in the milk. They will be mentioned briefly.

LABORATORY CHECKS ON HERD

The veterinarian in checking the cows twice each year for tuberculosis needs tuberculin made in the laboratory. The milk may be examined also for the presence of tubercle bacilli by any one of three methods: (a) direct microscopic examination by the Ziehl-Nielson method, distinguishing between the acid-fast tubercle bacillus and acid-fast saprophytic bacteria that may be present; (b) cultural methods as for example Wolter's method (24) of destroying the non-acid-fast bacteria in the milk with hydrochloric acid and then cultivating the acid-fast bacteria on an egg containing malachite green or by cultivating according to some one of the other methods described (4); (c) animal inoculation. Milk to be tested for tubercle bacilli by animal inoculation should be treated with sufficient boric acid to make a 1 percent solution (22). This is especially desirable if the milk is to be shipped since boric acid does not harm the tubercle bacillus but prevents growth of the other bacteria.

When it comes to checking the herd for infectious abortion, again the laboratory plays an important part. Samples of blood are sent to the laboratory for serological tests. The milk may be examined by any one of three methods for the presence of *Brucella:* (a) by running an agglutination test on the milk serum after the cream has been removed and the casein coagulated with rennet [rapid (10) or test tube method], (b) by guinea pig inoculation of cream from milk drawn aseptically from each quarter (8), or (c) by plating (7) on liver agar or special Bacto tryptose agar (10) to which crystal violet has been added.

Likewise when the herd is being checked for mastitis, the laboratory is invaluable. Samples of milk from the infected udder may be sent to the laboratory in 30 percent glycerol (19) or 0.1 ml. of 1 percent brilliant green (1:10,000, added after which they may be plated out on standard agar or streaked on a Burri slant. Typical

* Paper presented before the Dairy Technology Society of Kansas City, Mo., Nov. 18, 1942, and Kansas Dairy Inspectors School, Manhattan, Kansas, Nov. 19, 1942.

streptococcus colonies are picked and stained by the Gram procedure and subsequently transferred to blood agar for typing. In the routine checking of herds for mastitis the direct microscopic test may be employed to advantage. In this way each individual quarter of every cow can be checked as frequently as necessary.

Thus far we have been dealing with the laboratory as an aid in helping to discover specific diseases of the herd which are more or less commonly associated with the milk. We shall now take up the more general methods.

STANDARD PLATE COUNT

The standard plate count has been greatly criticized. It has become the favorite pastime of many producers and some laboratories. In order to appreciate what the plate count has done for the milk industry, one should know the conditions which prevailed before its adoption in 1910. Prior to that time, every laboratory had its own medium, and the procedures varied to such a degree that there was chaos. Every bacteriologist was a law unto himself when it came to testing milk and would be today if it were not for Standard Methods. Sedgwick and Batchelder made the first bacterial tests on milk in 1892. After that many men in different cities made bacterial counts on milk in an experimental way but not as a control measure. Certified milk was first produced in Montclair, New Jersey, under the supervision of medical men for baby feeding and is said to be the first city in America and probably in the world to undertake a regular bacteriological examination of its milk supply. Park as early as 1901 suggested the control of New York City's supply by means of bacterial tests. However, widespread use of bacterial tests for market milk supplies did not become recognized or generally used until the procedure for analyzing milk bacteriologically was standardized in 1910 by the Laboratory Section of the American Public Health Association.

According to Breed (2) from the very beginning of Standard Methods and practically from then until now, there have been two schools of thought regarding the use that should be made of bacterial counts of milk supplies. One group felt that the total bacterial population was the important thing while the other group held that the total count was not important since it gave no indication of the safety of milk for human consumption. Those of you who are interested in the history of the various changes made in the medium for making plate counts of milk as recommended in Standard Methods should study them in the light of these facts. European countries on the other hand had no such controversy so have always designed their media to grow the greatest possible number of bacteria present in milk. Doubtless there are in this audience, as in every audience, representatives of the two schools of thought on the primary objective of a medium for determining the bacterial flora of milk.

While the controversy was raging over the best medium to use, statistics showed that most of the pathogenic bacteria that were causing the greatest amount of trouble when present in milk did not grow very readily if at all on the proposed media. As is now well known most pathogenic bacteria are too exacting in their food requirements and physiological conditions that either they do not grow or grow so slowly that they are more or less completely subjugated by the saprophytic bacteria present. Furthermore, even though they did grow on standard agar, they would not be recognized as such without additional tests to determine their identity. It is extremely doubtful if we ever shall devise any one medium to grow all the bacteria present in a sample of milk. The more we learn about bacteria the more remote this possibility becomes.

DEVELOPMENT OF NEW TECHNICS

While we were learning the limitations of the plate count, we were also striving to develop new methods to give a more complete bacterial picture of milk. One of the early methods devised was the direct microscopic count (3). This method proposed by Breed in 1911 is gradually replacing the plate method due to the great savings in time and money as well as the wealth of information that an experienced operator can obtain by examining a sample of milk.

Recently Mallmann and Bryan (14) have made changes in the direct microscopic method which they claim greatly facilitates making the test and gives a much clearer picture of the bacteria present in a milk stain. Briefly they have substituted a 4 mm. (outside diameter) loop for the 0.01 mm. pipette or loop to deliver 0.01 ml., and have spread the smaller loopful over a 4 x 8 mm. area using a guide plate. The preparation is dried, treated with xylol, and stained in acid methylene blue made by adding 1 percent HCl to 1 : 500 alcoholic methylene blue. The bacterial count on the preparation is made by using a Wratten No. 22 filter which makes the bacteria more readily distinguishable. The milk is colorless and the bacteria stand out in bold relief. Care must be used in decolorizing especially in milk containing few bacteria or else it is impossible to see the stained preparation.

INDIRECT METHODS FOR ESTIMATING BACTERIA

Indirect methods that have been devised to estimate bacterial populations of milk are the methylene blue test proposed by Barthel (1) in 1908, and the resazurin test suggested by Pesch and Simmert (18) in 1928. The methylene blue test has been used for years as a platform test to detect raw milk containing a large number of bacteria or other abnormalities. It has been of inestimable value to dairy inspectors in detecting carelessness on the part of the farmer. They have been able to grade the milk quickly and thereby prevent undesirable milk from entering the general supply. The methylene blue test like many other tests has certain inaccuracies and drawbacks. One of the principal objections to it is the length of time required to grade the milk. Therefore, when resazurin was introduced in 1928 with a reduction time of one hour or less, it appeared to be the answer to the dairy inspector's prayers. However, it had to run the scientific gauntlet and prove itself just as methylene did 20 years previously. Methylene blue was not accepted immediately when first introduced and one could hardly expect resazurin to be. Points in controversy with both dyes were the suitability of commercial preparations, standardization of reduction times, and point anomalies, and their ability to measure the bacterial quality of the milk. These points have been settled satisfactorily in the case of methylene blue, and real progress has been made along these lines in the case of resazurin.

One of the latest papers (11) dealing with the suitability of resazurin for determining the sanitary quality of milk finds that resazurin is equally as sensitive as methylene blue to the metabolic activities of bacteria in milk and is decidedly more sensitive to the presence of non-bacterial factors in milk such as non-infectious mastitis and late lactation and therefore furnishes a more comprehensive index of the true quality of the milk. There has also been criticism of resazurin on the basis of its poising action (resistance to change in potential upon the addition of an oxidizing or reducing agent). Potentiometric studies (11) with a wide variety of milks have failed to show that resazurin exerts a strong poising action or that the poising properties of different milks is of sufficient magnitude to affect the test.

It would seem then from all the recent studies that compared it to methylene blue, resazurin is much more sensitive to milk from diseased or otherwise abnormal udders, and it is equally sensitive to the reducing activity of bacteria growing in the milk. Furthermore, there seems to be no inherent reason such as poising action that would exclude its use.

OTHER LABORATORY AIDS

One of the most interesting developments in the dairy industry is the appearance of new groups of bacteria from time to time. These groups have appeared most generally after some change was made in the bacteriological medium or methods. Thus, we had the appearance of the thermophilic group of bacteria after we discarded titration in favor of the pH method for determining the reaction of culture media. Likewise, we never heard much about thermoduric bacteria until we began using a more adequately nutritious medium for plate counts. These changes did not create new species *de novo*. The bacteria were undoubtedly present all the time. The changes simply brought about conditions which emphasized or brought them to light. We had microbial diseases for centuries but it was not until we had media and other bacteriological tools that we were able to demonstrate the cause.

Thermoduric bacteria seem to be getting the "play" at present so we shall say a word or so about present day laboratory methods of detecting them. The laboratory pasteurization-agar plate method first suggested by Taylor (20) or some modification (9) (13) (16) of it is the method used for determining this group of bacteria in milk. Comparative studies (6) (12) of all the methods show that the method proposed by Myers and Pence (16) is superior and more convenient than those proposed by Hileman and Leber (9) and by Mallmann, Bryan, and Fox (13) in determining thermoduric bacteria in milk supplies, and is more economical of time, media, glassware, and incubator space than the original method of Taylor (20).

It has been shown that the methylene blue and resazurin tests are ineffective in weeding out milk with large numbers of thermoduric bacteria (6) (12) (17).

While considerable attention has been given to this group of bacteria, they have no sanitary signficance. It has been well established by numerous workers that thermoduric bacteria found in raw or pasteurized milk may originate in the udder and that they may grow abundantly in dirty utensils and milking-machines and are resistant to chemical and physical agents. They, therefore, reflect the care with which the milk has been produced. On the other hand thermophilic bacteria reflects the care used in cleaning plant equipment such as pasteurizers, pipe lines, etc. It is generally conceded now that fundamentally thermoduric bacteria are a problem of the producer, and thermophilic bacteria, of the manufacturer (5).

THE PHOSPHATASE TEST

The phosphatase test is the greatest contribution to the safety of milk since the introduction of pasteurization itself. It ranks along with Babcock's fat test, the plate method, the direct microscopic method, and other similar tests for milk. It is now possible for the first time to check accurately milk pasteurization. Heretofore, we were at the mercy of the milk dealer or worse still some one in his employ. If the operator got there late in the morning and wanted to make up for lost time, he could speed up the pasteurizing process by any one of several ways. Unless the milk inspector were on the premises, there was no way of checking the operator. Since pasteurization is our greatest and final protection against milk-borne diseases, it is highly

important that we have an accurate and reliable test for it.

COLIFORM AND OTHER TESTS

Within the past decade a great deal of emphasis has been placed on the coliform test in milk. Every one was familiar with its significance in water but when it was first proposed for milk and dairy products, many objections were raised to it. The coliform test is gaining in favor among sanitarians, and is now considered one of the best three tests for determining the sanitary quality of milk. The presence of coliform organisms in raw milk may indicate any one of the following: inflamed udder, poorly sterilized milk pails, milking machines, cans, etc. However, too much emphasis should not be placed on high coliform counts in raw milk since the organisms grow very rapidly under the proper conditions. If excessive counts are found, the dairy utensils should be checked bacteriologically by rinsing with sterile water and plating, and udder examination if the conditions warrant. Some consider coliform tests on raw milk an unnecessary duplication of effort since the same information could be obtained by plating or by direct microscopic examination of the milk. When positive presumptive tests are secured repeatedly on samples of raw milk, the milk is considered unsatisfactory and calls for farm inspection. In pasteurized milk the results are considered more significant, since pasteurization eliminates all but a few heat resistant coliform organisms. The presence of coliform bacteria in 1 ml. samples of freshly pasteurized milk is considered to indicate improper pasteurization or recontamination after pasteurization either of which is objectionable. The phosphatase test should be run on such milk and if found negative, tests should be conducted at the plant to determine the cause of the coliform contamination.

Other tests that can be used to advantage by the dairy inspector are odor and sediment tests. A trained man can readily detect off-flavors in milk such as mastitis, sour, yeasty, fecal odors, and set the cans aside for additional tests. Sediment testing of milk has been of great value in educating farmers to produce clean milk. Weckel (23) has shown the wide variation in the manner of conducting the tests, the instruments used, the sediment discs employed, and the results obtained. It is evident from his study that sediment tests are badly in need of standardization. We should also decide on what use we are going to make of the test. Is it going to be used in an educational or in a legal way? This will determine the technique which should be used in making the test.

PROBLEMS THE WAR HAS BROUGHT

It is probable that with the great shortage of man power on farms, in milk plants, for delivery, and for milk inspection, we shall have to rely more and more upon laboratory tests to determine the safety of milk. Added to the lack of properly trained men, new machinery is going to be hard to get as well as to keep working efficiently. There does not seem to be a proper understanding of the dairy problem by the W.P.B. They want more dairy products but are not willing to release the materials necessary for their production.

The cost of agar-agar has greatly increased since the war due to its scarcity because a great deal of our supply formerly came from the Indian Ocean and the Chinese and Japanese waters. However, the manufacturers say there is plenty of agar-agar available, and we need have no fear of not having enough for our needs.

WHAT OF THE FUTURE

"We should be much concerned about the future; we are going to spend the rest of our lives there" is a bit of logic advocated by Charles F. Kettering, head of the research division of the General Motors Corporation. So it is

with us. What is in store for us in milk sanitation from the standpoint of the laboratory? It looks as though we are going to use the plate method less since it is expensive, time-consuming, and tells only a part of the story. In its stead we shall substitute the direct microscopic test supported by other tests. For raw milk, we shall use the odor test, the sediment test, and either the direct microscopic or the resazurin test or both. For pasteurized milk, we shall use the direct microscopic method supplemented by the coliform and phosphatase tests. New York State has been experimenting with these three tests for pasteurized milk for a number of years now. According to Tiedeman and Hohl (21), these three tests are superior to all others for determining the safety of the milk supply of any community. Other states such as Connecticut have been using the "three-test system" for controlling their pasteurized milk supplies since 1935. According to Mickle (15) it is satisfactory and gives them a better picture of the sanitary quality of their milk supply than does the Standard plate count.

SHALL WE HAVE INSPECTORS

Shall the laboratory tests ever develop to the point where we can do away with milk inspectors? No. I do not think we shall reach that stage for some time yet. What I do think and predict is that the future inspector will have to be a better trained man than he is today. He will be a combination of an inspector and laboratory man. He shall do most or all of his own laboratory work. The trend is definitely in that direction. Most tests are so worked out that they can be applied in the field without elaborate laboratory equipment. We are more likely to do away with the laboratory technician than the inspector in milk work. The ideal is to use the milk inspector to locate the visible dirt, and the laboratory to find the invisible dirt. They should supplement rather than supplant each other.

REFERENCES

1. Barthel, Chr. Verwendbarkeit der Reduktaseproble zur Beurteilung der hygienischen Beschaffenheit der Milch. *Ztschr. Untersuch. d. Nahrungs. u. Genussmittel,* **25,** 385 (1908).

2. Breed, R. S. The Whence and Whither of Milk Sanitation. *Canadian Pub. Health Jour.,* 417 (1940).

3. Breed, R. S. The Determination of the Number of Bacteria in Milk by Direct Microscopic Examination. *Centralbl. f. Bakt., II Abt.,* 30, 337 (1911).

4. Diagnostic Procedures and Reagents. American Public Health Assn., New York, 1941.

5. Fabian, F. W. Thermoduric Organisms in Relation to High-Temperature Short-Time Pasteurization. *J. Milk Technol.,* **5,** 237 (1942).

6. Fischer, J. B., and Johns, C. K. A Comparison of Various Methods for Detecting Thermoduric Bacteria in Milk. *Ibid.,* **5,** 269 (1942).

7. Hasley, D. E. *Brucella abortus* in Certified Milk. *J. Infec. Dis.,* **46,** 430 (1930).

8. Henry, B. S., Traum, J., and Haring, C. M. Methods for the Isolation of *Brucella abortus. Hilgardia, Cal., Agr. Exp. Sta.,* **6,** 356 (1932).

9. Hileman, J. L., and Leber, H. High-Temperature, Short-Time Pasteurization and Its Practical Application in the Dairy Industry. *J. Milk Technol.,* 4, 128 (1941).

10. Huddleson, I. F. 1939. Brucellosis in Man and Animals. New York: The Commonwealth Fund.

11. Johns, C. K. The Behavior of Resazurin in Milk. *Canadian J. of Research,* Sec. C, p. 336, June, 1942.

12. Little, L. Bacteriological Control of Milk Quality. *J. Milk Technol.,* **5,** 221 (1942).

13. Mallmann, W. L., Bryan, C. S., and Fox, W. K. A New Microscopic Procedure for the Detecting and Locating of the Source of Thermoduric Organisms in Milk. *Ibid.,* 4, 195 (1941).

14. Mallmann, W. L., and Bryan, C. S. The Development of New Technics in the Microscopic Examination of Milk. (Paper presented 31st annual convention, International Assn. Milk Sanitarians, St. Louis, Mo., Oct. 30, 1942. Early publication in this JOURNAL.)

15. Mickle, F. L. The "Three-Test System" vs. the Standard Plate Count in Official Milk Control Work. (Paper presented 31st annual convention, International Association Milk Sanitarians, St. Louis, Mo., Oct. 30, 1942. Early publication in this JOURNAL.)

16. Myers, R. P., and Pence, J. A. A

Simplified Procedure for the Laboratory Examination of Raw Milk Supplies. *Ibid.*, 4, 18 (1941).

17. Parfitt, E. H. Some Bacteriological Problems Involved in High-Temperature Short-Time Pasteurization. *An. Rept. N. Y. State Assn. Dairy and Milk Inspectors,* 13, 195 (1939).

18. Pesch, K. L., and Simmert, H. Eine Neue Resazurin Reduktionsprobe für Milchuntersuchung. *Süddench. Molk-Zeit.,* Sept. 20, 1928.

19. Standard Methods for the Examination of Dairy Products, 8th Ed., 1941. American P. H. Assoc., New York.

20. Taylor, G. B. Some Observations on the Scientific Control of Milk Plants from the Standpoint of Bacteria. *Intl. Assn. Dairy and Milk Inspectors Ann. Rept.,* 13, 287 (1924).

21. Tiedeman, W. D., and Hohl, N. J. Improved Laboratory Control of Pasteurized Milk. *Amer. J. Pub. Health,* 28, 629 (1938).

22. Traum, J., and Hart, G. H. *J. Am. Vet. Med. Assoc.,* 49, 676 (1916).

23. Weckel, K. G. The Status of Regulations and Practices in Determining Extraneous Material in Milk. (Committee Report.) (Paper presented 31st Annual Convention, International Assn. Milk Sanitarians, St. Louis, Mo., Oct. 31, 1942. Early publication in this JOURNAL.)

24. Wolters. *Deutsch. tierärzt. Wchnschr.,* 39, 547 (1931).

MARKET MILK DIVISION CONSOLIDATED WITH DAIRY RESEARCH

The Division of Market Milk Investigations, so long and well known under the direction of Mr. Ernest Kelly (an active member of the International Association of Milk Sanitarians), has been consolidated with the Division of Laboratory Research Laboratories of the U. S. Bureau of Dairy Industry. All of the old personnel of "Market Milk" are now transferred to the Laboratories. Mr. Kelly, now Assistant Chief of the Bureau of Dairy Industry, will maintain his active interest in the field covered by this organization.

Protecting and Maintaining Milk Supplies in Wartime*

SOL PINCUS

Deputy Commissioner, Department of Health, City of New York

WHILE many of us had thoughts about the imminence of war prior to December 7, 1941, I do not believe that we did very much concrete thinking before the treacherous attack on Pearl Harbor about what steps we, as control officials, should take concerning our milk supply. We had read the newspaper stories about the London milkman carrying on his early morning deliveries during the severest period of the "Air Blitz" and it did not take much imagination to realize that milk plants would be no more immune to the effects of a well placed bomb than would a residence or even a hospital.

There was very little in the way of precedent which we could use for guidance but our thoughts on safeguarding the milk supply centered around the following main objectives:

1. Blackout protection of the plants in case of night air attacks.
2. Protection of the milk supply and plants against possible sabotage.
3. Provisions for emergency pasteurization in case some of our plants were disabled by enemy action.

Our first step was to appoint a committee composed of the engineering personnel of some of the larger plants to study the blackout problem and to make recommendations which could be adopted by the industry as a whole. Since each plant presented construction problems peculiar to itself, the committee, of necessity, had to confine its recommendations to general principles. After approval of the recommendations by the Department of Health, copies were sent to every plant in the city and, subsequently, the Board of Health in March promulgated an order requiring all plants operating at night to provide adequate blackout facilities. The methods generally used for this purpose consisted of installation of shades, painting of windows and skylights, or a combination of both methods. Loading exits also were blacked out.

Since the engine room represents the heart of a milk plant, it was deemed necessary at this time to warn operators to take unusual precautions in keeping strangers out of that portion of the plant and also to have operators seek wherever possible to provide an alternate source of power to be able to keep the plant running.

It next became necessary to consider what protective steps we might be able to take to prevent wilful injury to milk plants and to the milk supply by persons sympathetic to our enemies. Here again, a committee was appointed representing plant operators to work in conjunction with our Department on proposals for industry-wide application.

The proposals resulting from the work of this committee, which were later incorporated in a Board of Health order, may be broadly stated as follows:

1. To require every milk company employee to fill out a questionnaire prescribed by the Department of Health, which was designed to show the employee's background, i.e., citizenship, place of birth, previous employment, previous membership in organizations having an un-American attitude, latest visits to foreign countries, and close relatives in foreign lands.

* Presented at the Twentieth Annual Conference of the New York State Association Milk Sanitarians, Albany, September 23, 24, and 25, 1942.

2. To require the fingerprinting of each employee and the submission of such prints to the Federal Bureau of Investigation for checking.
3. To require each employee to wear an identification badge of a distinctive color, depending on the type of his work. Different colored badges were allocated to three general types of employees, namely, those engaged in processing; those distributing finished products; and employees hauling milk between plants.
4. To post signs at all plant entrances prohibiting access to unauthorized persons, to prevent strangers from gaining entry.
5. To require the sealing or locking of all milk storage tanks and of all tank trucks and tank cars carrying milk to and from our plants. No operator is permitted to receive milk in any vehicle which has not been properly sealed, and no partly emptied tank car or tank truck is to be left unattended unless resealed.
6. To carry out rigid quality control measures in order to maintain essential sanitary safeguards.

The working out of this program with the cooperation of the industry represents somewhat of a departure from the usual relationship which exists between business and an official regulatory agency. Here, the realization of the joint responsibility for solution of a problem involving the interests of the consuming public provided the basis for a new mutual approach in solving it. The milk companies deserve great commendation for wholeheartedly contributing their efforts in working out a plan of procedure. An extension of this principle in dealing with all major problems affecting public interest would be most desirable.

The task of providing emergency pasteurizing facilities in case of destruction of one or more plants is one which must be taken care of in the light of existing local conditions. Within the limits of New York City, where we have 45 commercial milk plants, it would be comparatively easy to divert the operation of a few disable plants to those still functioning. The Board of Health on March 12, 1942, in adopting orders governing wartime precautionary measures for milk plants has provided "that if one or more pasteurizing plants are rendered inoperable because of damage or destruction, the Commissioner of Health is authorized to require other plants under the supervision of this Department to process such additional supplies of milk as may be made available, and, as the Commissioner may deem necessary to assure a sufficient supply of pasteurized milk for the City."

This problem would probably be more acute in smaller communities where there is perhaps only one pasteurizing plant and no emergency facilities readily available in the locality. Recognizing this possibility, the New York State Department of Health plans to make provisions for the use of portable steam boilers, electric generators, and other essential mobile equipment which could be set up in a disaster area and thus take care of the pasteurization of milk in an emergency.

The New York State Public Health Law through an amendment by the Legislature in the spring of 1942 has a provision similar to that of the New York City Board of Health Order, authorizing the State Health Commissioner, in case of an emergency, to divert milk from one plant to another, and from one municipality to another for pasteurization and bottling. The amendment to the state law also empowers the Commissioner to embargo milk which may become a potential danger to health as a result of accident, sabotage, or enemy action. It should be noted that other jurisdictions have since adopted similar provisions for emergency protection of plants and supplies.

We now come to a consideration of maintaining the volume of our milk supply, and to some of the sanitary problems associated with it. Enough milk must be produced not only for the civilian population and armed

forces, but also to take care of the tremendous demands being made on us for dairy products by our allies. Up to the present time producers have been able to meet these demands despite the critical farm help shortage brought about in part by the demands for labor in war industries. The farmer has been compelled to a greater extent than before to resort to mechanical devices as a substitute for manual labor. In the case of the dairy farmer this has meant a considerable increase in the utilization of milking machines. While this helped solve the production problem it has increased the problem of sanitation. Many milking machines have been purchased by persons who have had no previous experience or training in their proper care. Our field inspectors report many instances where milk has been rendered unfit for fluid use by coming in contact with unclean milking machines. In order to correct this situation we requested plant operators to arrange with milking machine manufacturers to have their representatives instruct each producer who is about to purchase a new machine regarding its proper cleaning and sterilization. In addition, we have advised our plant operators to make frequent inspections of milking machine dairies. I may say that the dairy and milking machine industries, county agricultural agencies, and representatives of agricultural colleges have made valuable contributions towards correcting some of the insanitary practices commonly encountered in milking machine operations. We cannot, however, take the position that this problem has been completely solved. All persons concerned with milk sanitation must constantly be on guard and give this matter continuous attention, if material improvement is to be attained.

Milk producers are not the only ones affected by personnel problems. Country plant operators, in particular, have keenly felt the effects of competition for labor by the war industries that have sprung up in the general vicinity of their plants.

While the plant labor situation in New York City has not been quite as acute, city operators have in many instances been unable to obtain replacements of persons who formerly performed jobs in their pasteurizing plants which required special training and experience. We have been working on plans which we hope will somewhat alleviate this situation, by having courses organized for training supervisory personnel for country and city plants. A special course for training plant sanitary supervisors is scheduled to start next month at Columbia University School of Public Health under direction of Professor Earle B. Phelps. It is to extend through ten (10) weeks—two afternoons per week and will consist of lectures, laboratory work and actual demonstrations in plants. A similar course is planned to be given at Cornell by the Dairy Department at a later time. It is our belief that if a plant has in its key positions trained personnel, the job of properly breaking in new employees will be greatly facilitated.

Next to the personnel problem, the maintenance of plant and equipment is of most serious concern to the plant operator. The carefree days when a more modern piece of equipment could be purchased to replace older but still serviceable machinery, are over for the duration. In full realization of this condition we have relaxed our equipment requirements. Many of the refinements in construction which we formerly expected are no longer required. Our position now is to permit the continued use of any equipment which can be kept in a reasonable state of repair, and, which is not likely to contribute to a bad health hazard. We are now permitting the use of soldered milk cans and pails where seamless types are not available. Because of the specific restric-

tion on the use of tin by the federal government, we are no longer requiring the use of pure tin solder. Studies of contemplated changes involving major re-design in the construction of equipment have been suspended. A considerable amount of plant construction work planned before the war, has been put off until the end of the emergency.

It has been a reversal of our previous attitude, something rather difficult for our inspectors to make, to tell an operator ready to replace long used equipment with newer machines, that we will not aid him in getting the new equipment but rather urge him to continue use of the not so modern but still serviceable machines he already has.

Milk distribution in wartime has already undergone some change and will undoubtedly be subject to further adjustments with the prolongation of the war. The Office of Defense Transportation has restricted calls on customers to one a day, eliminating special deliveries and call-backs for collections, and for picking up empty containers. Some communities have instituted every-other-day deliveries on retail routes in order to conserve equipment and materials in accordance with the O.D.T. order. New York City milk dealers drew up a plan for a six-day week for wholesale deliveries and every-other-day retail deliveries. This plan has been held up pending decisions by the War Labor Board on the complaint of the unions of loss of positions and changes in contract terms. Municipalities that have an age limit for the sale of milk will, in some cases, be compelled to modify their laws to enable curtailed deliveries. In case of New York City, provisions have been made to permit the extension of the time limit during which milk may be sold, from 48 to 54 hours after pasteurization, if such action becomes necessary.

We are also likely to see changes in the current practices of transporting raw milk from country sources to the city. The federal government agencies are studying the possibilities of increasing railroad tank shipments of milk and reducing tank truck movements. One of the plans under consderation is to confine fluid milk shipments by tank trucks to plants relatively close to the point where the milk is to be pasteurized. It is not an uncommon practice at present to haul milk to New York City by tank trucks from 300-mile distances and, in fact, there are a few instances where milk is trucked 400 miles.

Consideration should be given by health authorities and agricultural departments to the removal of present prohibitions against the standardization of milk. It would seem that a great amount of unnecessary transportation of milk could be eliminated if milk standardization at processing plants would be permitted in this State as is being done in other areas.

More efficient utilization of hauling facilities and further conservation of tires and gasoline could be effected by re-arranging hauling routes from farms to plants. This may conceivably mean a change in delivery point of producers and the combining of routes which do not carry capacity loads. Our Department has abandoned for the duration of the war its previous restriction against hauling milk from unapproved producers on the same vehicles which are used to transport milk to plants under our inspection.

In the face of all these changes which are made necessary because of the war, we must not lose sight of the importance of maintaining adequate sanitary safeguards over our milk supply. The war effort would not be properly served if we relaxed our supervision to a point where milk-borne epidemics might result. Both the military forces and the civilian population, many of whom are engaged in production of war materials, require a safe and wholesome milk supply. This calls for even greater

vigilance than before on the part of milk control agencies, because of new personnel, equipment, and other problems with which we are faced today.

DISCUSSION BY MR. TIEDEMAN

We have a problem upstate similar to the problem that exists in New York City, but perhaps to a lesser extent as far as blacking out plants is concerned. However, we feel that there is a grave necessity for cooperation between dealers and for setting up mutual aid agreements.

I want to relate one or two instances that have arisen to indicate the importance of this. I think that if Hitler were to send out a few bombers to drop a bomb here and there, we might have some more drastic illustrations of what can happen to us which really would wake us up.

Our plan of mutual cooperation will work in peacetime as well as in wartime. We have an illustration of this in the Olean flood. Some of the inspectors who participated in the inspection of plants during the Olean flood are here and undoubtedly remember this. They reported that nine of the nineteen plants in the area were out of operation for some period of time, however, so far as we could determine no milk went out that was not pasteurized. Other plants were able to take over for those temporarily out of operation.

An important part of our plan is to know where the relief plants are in advance. In the event plant A is damaged, either through stoppage of water supply or electric power service or through a direct hit, plant B will take over, and if plant B is damaged, C will take over the job. The plan also provides for cooperation between cities and even larger areas if the damage extends far enough.

We have had only one suspected instance of sabotage so far. I relate it to show that the plan as it has been set up will work. An operator at a rural receiving station reported that he had found a white chemical substance in the bottom of all cans of milk delivered by a single producer, approximately seven or eight cans in all. He reported this to the county Director of Civilian Protection and it was relayed to our District Director of Emergency Milk Supplies. He investigated immediately, strained some of the solid substance out and brought it to the laboratory for examination. He immediately embargoed the milk under the provisions of the law to which Mr. Pincus referred. It developed that a recently naturalized German was a neighbor to this farm which aroused suspicion. The substance on laboratory test turned out to be ordinary rock salt. The farmer apparently had the idea that if he added rock salt, it would reduce the bacteria count. It cost the farmer plenty in loss of milk while the investigation was being made to find out this was not the thing to do.

Quality Improvement of Milk Supplies*

V. L. FUQUA

Department of Agriculture, Nashville, Tennessee

AT the present time everything is subordinate to the winning of the war and any activity should be postponed until after the war unless it has a direct bearing on the proper ultimate outcome.

The statement has been made that "Food will win the war and write the peace to follow." I do not doubt this statement in the least providing that the term "food" applied to good, clean, wholesome products — products that have been produced clean and kept clean, products that are clean and are not products that an attempt has been made to clean by some fancy manufacturing process. I sincerely believe that the quality of any dairy product depends on the raw product. It is somewhat difficult to convince some producers of this fact, however, especially when they have had a ready market in the past for all of their products regardless of quality or if they normally live in filth themselves and do not understand the importance of sanitation.

We have felt that the quality improvement of milk supplies has a definite place in the all-out war program and that any let-down in the quality would have a very distinct, adverse effect on the health and well-being of our armed forces, the civilian population, and our allies who so direly need these supplies.

Recently we discussed the manufacture of dried eggs with a representative of a large concern from whom we had seized several thousand pounds of the so-called finished product. They were breaking and drying some rotten eggs and in addition the general sanitation of the plant was such that even if the eggs had been good originally they would have been ruined before being placed in barrels, made the following statement, "The British and Russians are in such dire need of eggs that they would be glad to get any kind and in addition what they don't know about the operation of the plant won't hurt them." He stated further that "Even with the conditions we had complained of, the finished product was better than some dairy products he had seen being manufactured for a good number of years."

Now that is a serious condemnation, even though it might not be entirely true—we, as supposed to be guardians of good, clean, wholesome supplies, cannot afford to allow conditions to exist that might leave in the mind of even a few people the impression that some dairy products are handled or processed in such a way that they could become contaminated either in the unfinished product or during the process of manufacturing.

Being from Tennessee, which is a southern state and is consequently referred to by some people of traveling importance as the "Economic problem of the United States," we felt several years ago that possibly the dairy industry as a whole in Tennessee was growing too fast for the proper conditions of production and handling to be correctly followed. Not being as familiar with some of the problems as I should have been, however, I felt that no doubt our gravest problems were in the handling of cream for butter making and felt that surely

* Presented at the Thirty-first Annual Meeting of the International Association of Milk Sanitarians, October 30 and 31, 1942, St. Louis, Mo.

the manufacturers of dairy products from whole milk and the bottlers could and did secure a product above reproach—they all stated in their advertisements that they had the best product that could be produced—their products should be fed to babies; the milk was all grade A when sold in bottles; the production was under their personal supervision and some had even gone further (according to their own statements) and set up laboratory controls, placing the seals of the laboratories on their products or if such facilities were not available they prevailed on some independent laboratory to test some of their product and give them a letter or statement that their product was above reproach; or even others secured the Good Housekeeping Seal and displayed same to the general public. Right now I would like to enter a personal observation. I was raised to believe that a man's word was his bond and that there was no such thing as a "white lie," and furthermore, that the stretching of the imagination to cover a desired point was just as bad as going on and telling a bold-faced lie in the beginning. I was taught that truthfulness is insurance in this world against fire in the next, for which honesty is the best policy. Well you know since going behind the stage on some of these advertisements (that which makes you think you've longed all your life for something you never even heard of before) and claims for dairy products, I have just about come to the conclusion that there will be an awful scrap for the milk and dairy business in Hell because nearly all of the operators will be there fighting for the business. Going back to where I digressed, I believed in people's honesty, and as the butter people had not made many claims for the purity of their products and had not said much about their source of supply I thought maybe they would at least stand some investigating.

In the Spring of 1934 we held a number of meetings with cream procurement men and expressed our feeling and were assured that we were wrong, but about that time the Federal Food and Drug Administration published the fact that they had found some "extraneous matter" in some butter on the market. I got in touch with them and found out that "extraneous matter" was just a nice way of defining flies, fly parts, straw, sticks, human hair, rat hair, mouse hair, maggets, hair pins, nails, or just anything that you can possibly conceive as being small enough to be concealed or partially concealed in a pound of butter. You know, this somewhat shook my faith in at least part of the dairy industry, but they led me to believe that they did not know this existed and that they would do anything to eliminate such products from their butter. Well, I took them at face value again and we had a meeting and set up sediment standards for cream and held meetings throughout the State, showing the cream producers that these various foreign objects were in their cream and explaining to them how to produce and handle cream properly. We even went so far as to tell the producers that unless they did clean up, there would not be a market for their product. We then issued complete rules for cream station operators, setting forth the size and necessary equipment, and prohibiting the purchase of cream in containers such as lard pails, syrup pails, slop jars, etc., and heaved a sigh of relief as we knew that the cream and butter situations had been straightened out. What a grand step had been taken. It would be impossible to sell any cream that was not clean and fresh; consequently only clean, pure and wholesome butter could be manufactured. I had the assurance of the butter manufacturers to that fact, and as they were honest business men according to their own statements, and if they had known these before-mentioned conditions existed, they would have straightened them out long ago. I was optimistic,

in that cheerful frame of mind that enables a tea kettle to sing, though in hot water up to its nose. As luck would have it, we had an inspector that had been educated in the school of hard knocks. He did not believe anybody. So he prevailed on me to let him sell some cream to several of the plants. I did not think it was necessary, but to pacify him, I agreed. In about a week he brought me some cream checks and letters which he had received thanking him for sending the cream and requesting some more just like it. He stated that the cream he had sold was old and putrid and that some contained large quantities of so-called "extraneous matter." It was hard to believe, but to satisfy my own curiosity I then sold some cream, some of which were prepared samples and the same thing happened. "Thanks for sending your cream to our plant, please send some more just like it." One of the cans contained a dead rat. I became very much disgusted and informed all of the butter manufacturers that we were going to seize and destroy any butter found that contained any articles of filth and they all agreed with me that that was the correct step to take. Well, we collected numerous samples and ran sediment tests on them. None showed a sufficient quantity to justify condemnation. I could not believe it. A checkup on the plants revealed, however, that they had all installed high-priced, fancy filters and that from the standpoint of sediment in the finished product, they had caught me asleep at the switch—I was fooled again.

Realizing to at least a limited extent some of our short-comings, we then started on extensive campaigns of condemnation on cream delivered by the farmer, and on whatever butter we could connect directly with purchases of inferior cream. Consequently, during the year 1935–36 our condemnations were more than 1 million pounds of cream and more than 500,000 pounds of butter. This had some effect and the quality was improved to a certain extent, even if not to the point that it was desirable.

While in this activity, we found that some of the producers were discontinuing the sale of cream, and further investigation revealed that they were then selling milk to cheese factories, evaporating plants, or for bottling purposes.

Still believing that maybe the butter industry was the only rotten apple in the barrel, we called the purchasers of whole milk together and told them of our findings. They in turn, being true to form, stated that if any milk was being purchased that should not have been, it was without their knowledge or consent, and that if we would show them how to correct the situation they would put their house in order immediately. Still believing that some business men were honest and that they could be trusted, we prepared a regulation requiring that all milk be sediment-tested at least once each month, and that all milk which showed a sediment test which was worse than a number three pad, according to the Wisconsin Chart, was to be rejected. Thinking again that we had set the world on fire and had really accomplished something, we again rested on our laurels and talked about how all of our cheese, evaporated milk, ice cream, and bottled milk was above reproach.

About this time some of the CCC Camps began to demand grade A milk for their boys. Therefore, one day when everything seemed rosy and all of our problems were little ones, a representative of the Army called at our office and wanted a list of all grade A milk plants. We very graciously informed him that the grading of such plants was under the Health Department. Much to our surprise, we were informed that the Health Department worked only in an advisory capacity in communities that had a local ordinance, and that they had not approved all of the so-called graded supply.

Our law was very general and did not apply to labeling, so we were in a mess. Still believing in the good intent of people generally, we called on all of the unapproved grade A-labeled plants and explained the meaning of grade A. We asked that it be removed. Not a one would remove the unauthorized, false, and misleading label. The next move was to get a new dairy law passed. The 1935 and 1937 Legislature refused to bring our law up to date and include the necessary provisions, but when we had gathered proof of these unethical practices for four years and presented them to the 1939 Legislature, a new all-inclusive law was enacted. We then took heart and worked on fluid milk distributors from a labeling standpoint, getting all grade A labeling removed unless in accord with the approval of the local ordinance.

In the fall of 1940 we started running sediment tests at a few manufactured milk products plants, and much to our surprise we found conditions deplorable. One plant's supply ran as high as 98 percent unfit for human consumption—another shock. I then knew that the manufactured milk products plant managers could not be trusted. They were only interested in volume, and not in quality. Their pocket books (the book whose contents rule the world) would be adversely affected if they refused to buy any and all milk offered to them. I still had one hope—maybe the ice cream manufacturers and bottled-milk distributors were on a higher plane. So we decided to try them. We ran sediment tests on all of their product as received. Surely you all know the results—one grade A bottling plant's entire supply was condemned—99 percent of an ice cream plant. As a matter of fact, they were not as a whole a bit better than the manufacturing plants. Our period of optimism was over. We were at a loss as to how to proceed, as a whole 25 percent of the milk produced and sold in Tennessee was unfit for human consumption.

How were we to proceed: should we give up and admit that we were not big enough for the job, should we notify the consumers that 25 percent of the dairy products was unfit for human consumption, should we swear out warrants for every processer in the state? Honestly, I was completely baffled and for several days I seriously considered each and every one of the above solutions.

Realizing that maybe we had not done our part, we decided to start all over again from the beginning, and consequently scheduled producer meetings in county seats, school houses, and with farmer club women. For a period of three months we held either two or three meetings a day; we explained to the producers the necessity for clean milk, the proper methods for cleaning cows' udders, the correct types of equipment, the correct washing and care of equipment, and the importance of the entire program. We tried to appeal to their pride and to the fact that they were using part of the product at home; therefore, they should want only the best for their own use.

Immediately following this series of meetings we formed what we called our flying squadron of inspectors, and put them only on milk sediment testing and plant sanitation.

The inspectors would go to a plant and sediment test all of the milk received, condemning and coloring all rejected, coming back to the same plant the next day and re-checking all of the producers' milk that was rejected the day before, and then leaving instructions at the plant to sediment-test again within two weeks. This caused us some headaches. The first trouble was experienced when one producer claimed that the red coloring we were using had poisoned his hogs, and he threatened to go to court to collect damages. This was overcome, however, by explaining the type of coloring material, and then suggesting that if

he went to court it would be a public record that he was a filthy producer.

Our next trouble was experienced when some producers came in and contended that the milk we condemned was not dirty. We had been returning the entire sediment pad to the producer; therefore, we did not have any proof as to our findings, but we bluffed our way through and then changed our method. We quit giving the producer the entire sediment disc, and instead we cut the disc half in two and kept half for our permanent record of their sediment pad. We then sent every producer a letter, informing him that at any time in years to come, anybody could examine the pads and see if he was a filthy producer. You would be surprised at the effect this had, especially after one group of producers came in to complain about having their milk condemned, and we showed them their pads for the last three tests, and in addition showed them the pads of everybody else in that county.

Five months after the starting of this concerted drive, our condemnation as a whole had dropped to less than 5 percent, and we were then condemning on the number three example sediment chart, an improvement, on the whole, of more than 20 percent. One plant, though, was still causing us considerable trouble, and had not shown any improvement. An investigation showed that even though the milk was being condemned when our inspectors were there, the plant was paying the producers for this condemned milk; consequently, our condemnations were not having the desired effect. To overcome this, we delegated two inspectors to that plant with instructions that they were to stay in the plant and run sediment tests on every can of milk received for a period of six weeks, and longer if necessary. You would be astonished at the results we obtained. Before the six weeks' period was up, every can of milk being received was grading not worse than a number one. This was not accomplished, however, only by the sediment testing and condemning.

The third day our men were in the plant, they were enjoined by a court order from condemning milk, so we had to send two more men. They were enjoined on the fifth day, and we sent two more; then on the sixth day we condemned ten ten-gallon cans of milk which were owned by a very prominent political figure in the state.

An honest politician—one who, when he is bought, will stay bought. You have never seen anybody work as hard to get fired everybody connected with the Department of Agriculture. When this did not work, he secured a court injunction under the Dairy Law. We condemned the next day under the Food and Dairy Law. The final outcome was that when he found that we were ready to go to court and show his individual pads as an exhibit to our answer, and had so stated in our answer, the case was dropped.

We are continuing to run sediment tests in *all milk plants* on an average of once a month, and we are not leaving it up to the plants. We have finally come to the conclusion that they cannot be trusted whenever their pocket book is affected.

Our condemnations for September on a number three pad were less than 3 percent for the state as a whole.

In October, 1940, the Army informed us that a new camp located in the state would require more than 2,000 gallons of grade A milk per day, and that they had examined our source of supply, and that only one source would meet their requirements. We worked with a number of producers and procured the necessary amount of graded milk to meet their demands, and had continued to increase the amount until one area of supply developed mastitis in the herds, and they were rejected. This source then started selling to another Army area in another state and our producers became disgruntled. We then found that the Army was

making, or at least trying to make, a sucker out of us, as they were accepting milk at some camps that we had even refused for manufacturing purposes. We informed the Army that until they were willing to place the entire United States on an equal basis, we could not develop any more sources of supply. Now it seems that they have changed their mind about the requirements for a safe supply, and in connection with the U. S. Public Health Service have revised the standards for safe milk and have taken what I think is a backward step.

Have grade A standards been wrong in the past? Have we been requiring or attempting to require conditions for production that were not necessary? Is a large quantity of an inferior grade of milk better for the Army and the civilian population than a lesser supply of an adequately supervised graded supply? If the recommendations of the U. S. Public Health Service are followed, we will not have an improvement of our supply for bottling purposes, but on the other hand we will be going backward.

In this proposal I see a breakdown of nearly all that has been accomplished in the past for bottled milk, as it will be extremely hard to go back to a graded supply after the war and tell the consumers and consuming public that they now need a graded supply, when an ungraded supply had been adequate for the Army—sons, brothers, and fathers of the consuming public.

If the U. S. Public Health Service has been justified in the past in its recommendations, then it should have had the backbone to stand behind its convictions; whereas, if it was wrong in the past, then its recommendations for milk sanitation in the future should be disregarded, as it may be wrong again.

We are in a modern age, an age when girls wear less on the street than their grandmothers did in bed, an age of advancement—mold mycelia tests for butter, sediment tests for milk and milk products, bacteria tests for milk, improved, easily cleaned equipment, a better educated consuming public, a consumer that is interested in sanitation, a consumer that we each and every one must account to if a backward step is taken, a consumer that would throw his hands up in horror at some of the conditions that have existed in the past. Every step in the production and handling of milk should be above reproach. Consumers should be invited to see and witness all of these operations from milking until in the final can. All of our production and manufacturing operations must stand the critical examinations of properly educated housewives.

In conclusion, I believe the quality improvement of milk can be obtained only by diligent effort, the courage to fight for right, the will and backbone to stand up for your convictions, and last but not least, remember that nearly everybody connected with the dairy industry is in it for the dollar, and consequently his opinion of his own product should be taken with a grain of salt. They will all stand watching more or less.

Failure is the only thing that can be accomplished without effort.

Cooperative Milk Pasteurizing Plants*

G. W. MOLYNEUX

Chief Milk Sanitarian, Westchester County Department of Health
White Plains, New York

IN presenting this discussion of pasteurization of small milk supplies from a cooperative angle, I wish to emphasize the fact that complete blanket pasteurization is inevitable—inevitable because it is: (1) necessary to complete a well-rounded public health program; (2) supported by increasing popular demand; (3) useful as competitive fortification; (4) valuable as business insurance, and (5) good trade practice in offering a product desired by a majority of the population. Pasteurization of milk is credited with saving many human lives and will continue to serve that function as well as making a vast volume of milk marketable with respect to both price and condition.

The cooperative movement is not new. It originated in England during the "hungry forties" of the 1800's. Other foreign countries studied the idea, and scattered societies were formed. The movement grew from a dream of twenty-eight hungry workers in the English village of Rochdale until today practically every country in the world has some form of cooperative organization. That is, there was world-wide representation up to the time when activities were suppressed in Germany and Italy by the dictators. It is to be remembered that democracy is the basic principle of cooperatives. The real beginning of cooperatives in this country did not occur until after the first World War. The farmers who had been hard hit by the loss of foreign markets took the initiative and organized marketing cooperatives.

We now know it in this section of the country in relation to food stores, livestock feeds, fertilizers, insurance, hospitalization, apartment dwellings, and mostly in our particular field of dairy products. Dairy cooperatives lead all other commodity groups in the United States. Throughout forty-five states 2,400 dairy cooperatives are selling milk, cream, butter, cheese, and other dairy products for almost three-quarters of a million farmers. Approximately 48 percent of all fluid milk passes through the hands of cooperative marketing organizations. The movement is most prevalent in the Pacific coast, middle west, and New England areas. It is reported that in a community in Minnesota a cooperative society drove two chain stores out of town. The G.L.F. or Grange-League Federation with which we are all familiar serves over 100,000 persons.

The small milk dealer confronted with the problem of pasteurization should certainly explore the possibilities of a cooperative plant. Such an enterprise properly organized, managed, and operated has many advantages. In fact, the "little man" armed with the resources of a jointly owned and operated plant can take his place with "big business." Milk can be purchased and processed cheaper. Bottles, cans, caps, fuel, supplies, and equipment can be bought at a comparative saving. By-products can be manufactured and special milks such as premium butter-fat, homogenized, vitamin D, paper containers, and the like can be offered in direct competition with the large companies. With a battery of small pasteurizers properly synchronized, the milk from a producer-dis-

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

tributor can be handled separately with very little interruption in the plant operation. The high-temperature short-time units are especially adapted to maintaining the identity of a particular milk. Laboratory control and sanitary supervision can be maintained in a manner similar to the larger companies. The health departments' sanitary control activities can be more effectively applied to a smaller number of plants.

About five years ago in the quaint New England city of Fitchburg located in Massachusetts, a compulsory pasteurizing law was enacted to become effective the next year. At this time, about 33 percent of the milk supply was raw. The raw milk dealers had steadily lost ground and were confronted with the problem of maintaining existence. There was a need for a decisive solution of the problem, yet with limited funds. Three courses were open to the small producer-dealer: the sale of retail routes to dealers already pasteurizing and the acceptance of a producer status only, the provision of pasteurizing facilities, or the abandonment of the milk business altogether. Of course the resort to pasteurization was the rational choice of the majority.

Mr. Ernest M. Vieweg, a successful farmer and a producer-dealer, since deceased, contemplated the problem of seventeen dairymen determined to stay in business. An investment of approximately $3,000 each to equip separate plants, which meant an exorbitant outlay of $51,000 did not make sense to this shrewd gentleman. Out of this situation in the year 1938 was born the Tri-City Dairymen's Cooperative Association with seven producer-dealers as members, the others having become temporarily discouraged with the pioneering project. A central pasteurizing plant was erected and equipped with a battery of small pasteurizers and other necessary equipment for segregated pasteurization of about 1,200 quarts which, when ready for operation, included the production of the original seventeen dairymen. After three years of rapid progress, fair profits, and dividends, thirty producer-dealers were participating in the pasteurization of some 6,000 quarts daily. The individual businesses had been saved and were flourishing. The milk was kept separate for those who so desired and the production of others was mixed by agreement for a more uniform and stable product.

The capital of this cooperative is well invested and yields an interest rate of five percent per annum. In addition to a quality hooded bottle of milk, each dealer is able to offer his customers and prospective customers special milks and a wide variety of milk products formerly a monopoly of the city's three large distributors. The problem of individual surplus has been met by the manufacturing and wholesale outlets operated by the plant itself. Reports indicate increasing achievements for each year to date and point to the fact that Fitchburg has the answer to the producer-dealer problem where dealers are faced with compulsory pasteurization either by regulation, competition, or progress. Mr. Arne Oksanen, the able manager of the TriCity Dairymen's Cooperative Association, has on several public occasions extended an invitation to those seeking further information to visit Fitchburg, Massachusetts. This model cooperative has been the inspiration of similar units in other parts of New England.

In our own State a truly cooperative plant is operated at Albertson, Long Island. It was incorporated in late 1938 with ten or eleven members to meet a Nassau county health department regulation effective the following January 1. This unit started by augmenting an already established plant by the installation of a high-temperature short-time pasteurizer and other necessary additional equipment to handle its present 2,000 to 2,500 quarts daily. It also bottles for a few non-members. I am informed that it is a successful enterprise.

A later installation occurred in Waterburg, Conn., which commenced operation on June 18, 1941, with a membership of nine. It is known as the Waterbury Cooperative Dairy, Inc. The original members purchased $2,400 worth of stock on the basis of which operation was begun. The present membership is twenty and the capital is $3,400. The initial output of 2,400 quarts daily increased by 450 quarts the first week in September when the schools opened after the summer vacation. Indications point to a sound business.

Cooperatives offer possibilities and advantages not available to the average individual dealer. However, to be successful there must be a compelling need affecting a number of dealers and the spirit of cooperation must prevail. The small dealer is inclined to be as independent as a "hog on ice" but when the "hog" is small and the ice gets slippery, it behooves the would-be individualist to join his competitors in reducing the cost of processing. The big dealers have set an example in their reduction of country stations and consolidation of pasteurizing plants. What is good in this respect for the large dealers is even better for the smaller dealers, provided the latter can develop a genuine spirit of cooperation and obtain sound management of their cooperative enterprises.

REFERENCES

1. Frandsen, J. H. How Can the Small Producer Meet Pasteurizing Requirements? JOURNAL OF MILK TECHNOLOGY, 4, May–June (1941).

2. Oksanen, Arne. Cooperative Pasteurization. *Report of the Proceedings of the Sixteenth Annual Convention of the Connecticut Dairymen's Association.*

3. Oksanen, Arne. Organizing and Managing a Cooperative Dairy Plant. Presented at Farm and Home Week, University of Connecticut, July 23, 1940.

4. Stokdyk, E. A. Cooperative Marketing by Farmers. U. S. Department of Agriculture 1940 year book "Farmers in a Changing World."

5. Tri-City News. February, 1941. Published quarterly by the Tri-City Dairymen's Cooperative Association, Inc., 1151 Main Street, Fitchburg, Massachusetts.

The Detection of War Gases in Foodstuffs. *Analyst,* 1941, Feb., v. 66, No. 779, 44–54; *Bul. Hyg.,* 16, 342 (July, 1941); *P. H. Eng. Abs.,* xxii: Mi: 15.

"To meet a demand which had arisen in certain sections of the food manufacturing industry, the British Association of Research for the Cocoa, Chocolate, Sugar Confectionery and Jam Trades issued in April, 1940, a pamphlet on the identification and determination of war gases in foodstuffs, based on information available in published literature. As a result of subsequent discussion with the Chemical Defence Research Division of the Ministry of Supply, and with the Ministry of Food, this pamphlet has been revised by Dr. W. J. Stainsby and Mr. A. McM. Taylor, members of the staff of the Research Association, and, with the approval of the Ministries concerned, has been published in full in *The Analyst.*

"It is, as the title suggests, highly technical and it is also too pithy and condensed to allow of satisfactory abstraction. Briefly, the scheme of analysis proceeds by four steps: (1) Examination of the foodstuff as to appearance, odour, and physiological effects; (2) examination by air-flow analysis. These will indicate whether the gas is lachrymatory, and if it is, identification is proceeded with by (3) use of an alcoholic extract. If still unidentified, (4) the sample is extracted with ether or the gas concentrated on charcoal, for further testing. Tables are given showing the details of analytic procedure, and the 'war gases' are classified as follows, on the lines of the elements present, carbon, oxygen and hydrogen being ignored for this purpose:

"1. Halogen only (*e.g.,* chlorine, phosgene, diphosgene, chloroactetophenone, ethyl iodoacetate). 2. Sulphur only (*e.g.,* hydrogen sulphide), sulphur and Halogen (*e.g.,* mustard gas). 3. Nitrogen only (HCN), nitrogen and halogen (*e.g.,* chloropicrin, bromobenzyl cyanide). 4. Arsenic only (arsine), arsenic and halogen (*e.g.,* lewisite, methyl and ethyl dichloroarsines), and 5. arsenic, halogen and/or nitrogen (*e.g.,* diphenyl cyanoarsine, diphenylamine chlorarsine).

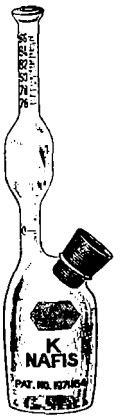
"The article is of the highest interest to food chemists, and indirectly to the health officer and readers of this Bulletin. Those desiring further information on the subject must, therefore, consult the original since nothing short of reprinting the article in extenso would do it justice." L. K. P.

METHOD FOR TESTING BUTTER FOR PERCENT OF FAT USING "PALEY" TEST BOTTLES *

1. Weigh out 9 grams of butter properly prepared (to the consistency of mayonnaise) in a Butter Test Bottle.
2. Melt butter in a warm place until the fat separates and visible curd appears.
3. Add 10 cc. of hot water, place stopper in bottle, and mix thoroughly.
4. Add about 10 cc. of Babcock sulphuric acid. Mix well and let stand for 5 minutes.
5. Centrifuge for 5 minutes in a hot centrifuge.
6. SHAKE VERY WELL.
7. Add water almost to the neck of the bottle (as for milk) and SHAKE VIGOROUSLY until all visible curd is dissolved.
8. Centrifuge for 3 minutes.
9. SHAKE VIGOROUSLY.
10. Add water to about the 80 percent mark.
11. Centrifuge for 10 minutes.
12. Adjust bottom of fat column to about zero, place in waterbath of about 140° F. for 5 minutes, then adjust bottom of fat column to zero, add glymol, and read.

* This method was devised by Charles Paley, Director, Certified Laboratories, Inc., 19 Hudson St., New York, N. Y.

This type of bottle is also useful for other solid or heavy materials such as thick cream, frozen cream, cheese, condensed milk, ice cream and whole milk powder. Modified Methods (such as the Minnesota or Penn State) should be used for ice cream or products high in lactose or other sugars.



Butter

Cheese
Ice Cream

Cheese

Legal Aspects

Typhoid Fever *

Typhoid fever—held to be accidental injury under workmen's compensation law.—(Maryland Court of Appeals; *Union Mining Co. et al.* v. *Blank*, 28 A.2d 568; decided October 29, 1942.) An employee contracted typhoid fever through drinking water furnished him by his employer. A laborer with buckets and dippers was provided by the employer and this laborer brought water at the expense of the employer from a spring about 400 or 500 feet away from the place of employment. This spring had been used with apparent immunity by the community for 100 years. The Maryland workmen's compensation law provided as follows: "'Injury', 'personal injury' and 'accidental personal injury' means only accidental injuries arising out of and in the course of employment and such disease or infection as may naturally result therefrom, * * *." The question before the State court of appeals was whether the infection of the employee was an accidental injury within the meaning of such compensation statute.

The appellate court, after reviewing many cases from other jurisdictions, stated that the question had not before been precisely presented to it but that there were a number of Maryland cases bearing on certain phases of the subject. These latter cases were then cited and discussed, following which the court said that it would be seen that under the Maryland law "an accidental injury is one happening by chance or taking place unexpectedly or unintentionally; that the injury need not be created by wound or external violence; and that the conditions causing an injury do not have to be confined to a particular and single time and place, but may extend over a considerable period." The court's view was that an application of its previous decisions to the facts of the instant case showed that the acquisition of typhoid fever by the employee was accidental. According to the court, the finding of typhoid bacteria in the water was clearly unexpected and was something which the employee did not look for and had no reason to suppose existed. Under the definition given "accidental" by the court and by the majority of the other courts passing upon it, and also by the standard dictionaries, the introduction of the typhoid bacilli into the system of the employee was therefore accidental. The injury was the infection or the ulceration of the intestines by the bacilli and it clearly arose out of and in the course of the employment because the water was drunk by the employee while working and was furnished him by the employer as part of the working conditions.

The judgment of the lower court in favor of the employee was affirmed.

* *Pub. Health Reports*, July 2, 1943.

Trichinosis *

Trichinosis—no liability of retail seller of sausage when uncooked.—(Maryland Court of Appeals; *Vaccarino* v. *Cozzubo*, 31 A.2d 316; decided April 8, 1943.) An action to recover damages for breach of an alleged implied warranty was brought against a retail seller of sausage. The sausage was purchased by the plaintiff's 11-year-old daughter and his wife cooked it for supper. Six days later the plaintiff became ill and several days after that his wife and daughter also became ill. Their illness was diagnosed as trichinosis. In the trial court a jury rendered a verdict in favor of the plaintiff, and the defendant appealed to the Court of Appeals of Maryland.

With respect to whether privity of contract existed between the plaintiff and the defendant, the appellate court held that such privity did exist, saying that the plaintiff's wife and daughter were acting as his agents in helping him to carry out his obligation to support and maintain the family.

The principal issue presented, however, was whether the trial court had properly instructed the jury as to the liability of the storekeeper to the purchaser. The court reviewed the pertinent provisions of the statute relating to sales and stated that it was absolutely clear that there was an implied warranty that the sausage was of merchantable quality and reasonably fit for human consumption. However, said the court, no implied warranty arises either at common law or under the statute that meat, generally fit to be eaten only when properly cooked, is wholesome when eaten raw or cooked in an unusual or improper manner, and "it would be unfair to impose upon a retail meat dealer an implied warranty that his pork is fit to be eaten when raw." According to the court this was especially true in view of the fact that the danger of contracting trichinosis from eating pork could

* *Pub. Health Reports*, June 25, 1943.

be eliminated through proper cooking. It was the court's opinion that the implied warranty in the case was not that the sausage was wholesome and fit to be eaten either cooked or raw but that it was wholesome and fit to be eaten after ordinary domestic cooking. The trial court had instructed the jury that if they found that the plaintiff was infected with trichinosis as a result of eating the sausage the verdict should be for the plaintiff, but the court of appeals took the view that the jury should have been authorized to give a verdict for the plaintiff only in case they found that the plaintiff was infected with trichinosis by eating the sausage after it was cooked in the usual or proper manner.

The judgment in the plaintiff's favor was reversed.

"Instant Whip" Wins in New York

The New York State Sanitary Code has included in its definition of a *milk product* "cream to which any substance has been added and for use in fluid state or whipped." In the same chapter is a provision that milk products "shall be made from milk or cream as herein defined and meet the applicable requirements of this chapter for milk or cream of a grade permitted to be sold in the municipality where sold or offered for sale."

The Aerated Products Company of Buffalo, distributors of a product called "Instant Whip" applied to the Supreme Court for a declaratory judgment, holding that "Instant Whip" was a manufactured food product and not a milk product. A referee, appointed by the court to hear and determine the issue, decided for the plaintiff, determining that "Instant Whip" was not a milk product and therefore was not subject to regulation under the Public Health law. The Department of Health appealed to the Appellate Division of the Supreme Court, which reversed the judgment and dismissed the complaint. Aerated Products Company then carried the case to the Court of Appeals, the highest State court. On March 4, 1943, the latter by a vote of four to two, one justice not participating, decided for the appellant, reversing the judgment of the Appellate Division and affirming the judgment of the referee. The substance of the determination of the referee was that cream, to which sugar and flavoring had been added and which was placed in a cylinder where it was mixed under pressure with nitrous oxide gas, had become "a manufactured food product, within the classification of 'frozen desserts mix'," when it was discharged from the cylinder.

"We accept it as a fact—found by the referee and not reversed by the Appellate Division—," the decision written by Justice Lewis said, in part, "That Instant Whip, due to its being processed and placed in sealed containers and thereafter kept in cracked ice, can be kept for relatively long periods of time, and belongs, economically, in the surplus commodity class such as ice cream and frozen desserts mix." As such, the court held, it was subject to the rules and regulations of the Commissioner of Agriculture and Markets under the so-called Frozen Desserts law.

The manufacturers of "Insant Whip," the court said, had conformed to such regulations but "There came a time . . . after July 1, 1939, when the appellant found itself involved in a controversy with local and State health authorities" due to a change in the Sanitary Code definition of milk products which was held to cover "Instant Whip."

The court, on the evidence, finds "Instant Whip" to be "a nutritive, wholesome and palatable food product . . . in no wise dangerous, harmful, or injurious to the health of the person eating the same" and finds that "in none of the States or communities outside of New York State where 'Instant Whip' is sold, are the licensees . . . required to comply with the same requirements as are imposed upon fluid milk and cream."

"We are mindful that the Sanitary Code has the force and effect of law," the court said, "when it deals 'with any matters affecting the security of life or health or the preservation and improvement of public health' within the State. . . . We also have in mind the rule of law that we may declare invalid the amendment of the Sanitary Code . . . 'only in the event that it is so lacking in reason for its promulgation that it is essentially arbitrary'." It says, however, that the amendment is viewed in the light of the concession made by the Commissioner of Health in his brief that the amendment "was made to bring plaintiff's product 'Instant Whip' within the definition of a milk product. That concession when considered against the background of facts disclosed by material findings by the courts below . . . leads us to conclude that the amendment here in question as applied to the manufacture, sale, and distribution of . . . 'Instant Whip,' is unreasonable, discriminatory, and arbitrary, and denies the appellant the equal protection of the laws and due process of law guaranteed to it as constitutional rights." The judgment of the Appellate Division was reversed and the Trial Term affirmed, with costs.

Two justices concurred in a dissenting opinion. "The fact that the product may be used as an attractive and delectable dressing to frozen desserts and may belong in the surplus commodity class," they said in part, "does not rebut the finding of the Appellate Division that the product is a milk product and properly regulated pur-

suant to the Sanitary Code. Whether this product should remain subject to regulation as to its manufacture and sale only as required under the Agriculture and Markets Law . . . or whether it is vital to health that the source also of the fluid cream should be subject to inspection and control, lies within the determination of the Commissioner of Health who is charged with safeguarding the health of the community. It cannot be gainsaid that supervision at the source affords greater safety to the public than mere supervision of the manufacture and sale." They said finally, "In view of the evidence supporting the reasonableness of the classification as a milk product, the regulation and supervision . . . in a manner employed for milk products generally cannot be said to be unreasonable, much less arbitrary and capricious."

—*Reported by* PAUL B. BROOKS

DR. MOHLER, BAI CHIEF, RETIRES

The Department of Agriculture announced that Dr. John R. Mohler retired July 31, after 46 years of Federal service, all of it in the Bureau of Animal Industry, of which he has been Chief since 1917. Widely known in the United States and abroad as an administrator, veterinarian, and pathologist, Dr. Mohler, who is 68, has devoted most of his life to the upbuilding and protection of the nation's livestock industry. Many of the activities that he has sponsored, such as Federal meat inspection and the suppression of bovine tuberculosis, have been highly beneficial to the public generally.

In accepting Dr. Mohler's request for retirement, Secretary of Agriculture Claude R. Wickard paid tribute to his varied accomplishments, adding that rarely does a Department official contribute so much to the national welfare over so long a period. "Dr. Mohler," he said, "brought distinction to the Department as well as raising the Bureau of Animal Industry to a position of world preeminence in its field."

Dr. Mohler will be succeeded by Dr. Arthur W. Miller, who has been assistant chief of the Bureau since 1928. Dr. Miller, who was born in 1876 at Manchester, N. H., spent the early years of his life on a ranch near Junction City, Kans. After graduation from high school and a short time spent in raising livestock, he entered the Kansas City Veterinary College. He graduated in 1901 and entered the Federal Bureau of Animal Industry where he engaged in meat inspection and livestock disease eradication work. In 1917 he came to Washington, where he has been successively chief of three different divisions of the Bureau.

Dr. Mohler was born in Philadelphia, Pa., May 9, 1875. He entered the Bureau's service in 1897 as a veterinary inspector assigned first to field work in the control of animal diseases. Later, he engaged in Federal meat inspection and subsequently entered the Bureau's Pathological Division, a research unit, of which he became chief in 1901. While serving in that capacity, he once inspected an importation of apparently healthy Zebua cattle quarantined at New York City. By a biological test, he detected in those animals the foreign livestock scourge surra. This discovery, followed by slaughter of the cattle, saved the livestock industry of the United States from infection by this devastating disease.

In 1917, the year that Mohler became chief, the Bureau of Animal Industry, in cooperation with State officials, undertook to eradicate bovine tuberculosis from the entire country. This cooperative project involved the systematic testing of every herd of cattle in every State. In spite of many obstacles, the project went forward under his direction until the disease, formerly infecting up to about 25

percent of the cattle in some areas, was reduced to less than half of 1 percent. This residual infection is now being suppressed by systematic retesting.

The eradication of cattle-fever ticks in the South has also been practically completed under his supervision. Other activities that have contributed to the health of domestic animals and the advancement of stock-raising have been the complete eradication of several outbreaks of the foreign malady, foot-and-mouth disease, the present campaign to eradicate brucellosis, the control of hog cholera, and official supervision of the commercial production of veterinary biological products.

Dr. Mohler has likewise sponsored the improvement of domestic animals by research in genetics and the application of scientific knowledge to practical stock breeding. Through his encouragement the Department has obtained breeding stock from abroad with qualities that can be utilized in improving domestic breeds and types. He has sponsored, likewise, an effective nationwide plan of poultry improvement involving breeding and disease-control features. A lover of horses, he directed the improvement of Morgan horses at a Department farm in Vermont. Many fine specimens, some of which have been used in Army horse-breeding, have resulted from this project.

Dr. Mohler has a wide acquaintance in Congressional and other official circles, and among representatives of livestock, dairy, and poultry organizations.

He is the author or translator of many scientific publications, and is the past president of both the American Veterinary Medical Association and the U. S. Livestock Sanitary Association. Among other honors was his election, in 1934, to the presidency of the Twelfth International Veterinary Congress.

U. S. GOVERNMENT MANUAL

The summer edition of the United States Government Manual, a 707-page reference book on the creation and organization, functions and activities of the Federal Departments and Agencies, is now available, the Division of Public Inquiries, Office of War Information, has announced.

The edition contains changes through May 15. Statements on all branches of the Government, a list of principal officials, a separate section on the emergency war agencies, and an appendix on agencies abolished, transferred, or consolidated since 1933 are included in the Manual.

The Manual may be purchased from the Superintendent of Documents, Government Printing Office, Washington, D. C., or at the U. S. Information Center, 1400 Pennsylvania Avenue, N.W. Single copies cost $1; subscriptions covering three editions, $2.75.

New Books and Other Publications

Food Poisoning, by G. M. Dack. Published by the University of Chicago Press, Chicago, Illinois. 1943. 138 pages. Price $2.00.

The author frankly recognizes that food poisoning does not present a uniform syndrome. He holds that the most typical feature of an outbreak of food poisoning is the explosive nature of the illness, generally characterized by gastrointestinal upsets. However, there are exceptions such as in botulism. He discusses the following causative agents: chemicals, poisonous plants and animals, bacteria and their products, protozoa and helminths, and a miscellaneous group of outbreaks of unknown etiology. Botulism and staphylococcus food poisoning are discussed at much greater length than any of the other types, giving their history, epidemiology, symptoms, treatment, laboratory diagnosis, and control. An additional twelve pages is devoted to a discussion of staphylococcic enterotoxin. Many references to the original literature support the text.

This small book contains much practical information. Useful directions are given for the investigation of a food-poisoning outbreak, and sample questionnaire forms are shown. Chemical poisons and those of animals and plants are listed respectively with the most common food concerned, the symptoms, and the time interval before the onset of symptoms after eating.

Tabulations epitomize the information and serve to illuminate the discussion without boring the reader. It does not purport to be an exhaustive treatise but is excellent to inform inspectors and food-handlers as to what food poisoning is, what causes it, how to recognize it, and what to do. It is pleasantly readable in content, style, and format.

Practical Emulsions, by H. Bennett. Published by the Chemical Publishing Co., Brooklyn, N. Y. 1943. 462 pages. $5.00.

The subtitle reads: A Handbook of Emulsions, Emulsifiers and Methods of Formulating and Making Emulsions of Practical Value in Industry. The author states that he aims to touch only lightly on the theoretical aspects and concentrates on the art of making and applying emulsions by the practical worker.

The first part, covering 200 pages, deals with the more general aspects, including lists of emulsifying and wetting agents, types of emulsions, methods and equipment, and lists of demulsifying and defoaming agents. The second part, 252 pages, deals with formulas for a wide variety of industrial, medicinal, food and other commercial products. A very large collection of references to the original literature increases the value of the book for the investigator.

Milk and Milk Products, by C. H. Eckles, W. B. Combs, and Harold Macy. 3rd Edition. Published by McGraw-Hill Book Co., Inc., New York, N. Y. 1943. 413 pages. 92 figures. $3.50.

The new third edition of this well-known text book follows the general line of the previous editions. It has been increased in size from 386 pages in the second edition to 413 pages in this one. In many places the text has been rewritten both to condense it and to make room for the additional material necessary to bring the book more up to date. This attempt sometimes imparts information without explanation as to how the process works, as for example, "Tryptic enzymes have been employed for the purpose of reducing curd tension"—probably

not understood by the beginning student and layman for whom the book is written. New tests added are the Pennsylvania Test, Testing Homogenized Milk, Determination of Hydrogen-Ion Concentration, Detection of Mold in Cream and Butter, the Resazurin Test, and the Phosphatase Test. It is well arranged for teaching as well as for informative reading by the layman.

Ordinance and Code Regulating Eating and Drinking Establishments Recommended by the United States Public Health Service, 1943, *Public Health Bulletin No. 280,* U. S. Government Printing Office, Washington, D. C., 20 cents.

This is the first printed edition of an ordinance and code recommended for adoption by local communities and States in order to encourage a greater uniformity and a higher level of excellence in the sanitary control of eating and drinking establishments. This edition replaces the mimeographed 1940 edition.

The publication is divided into 3 parts. Part 1 contains 2 short enabling forms, a grading type and a nongrading type, for use where such short forms are legal. Part 2 is the unabridged form of the ordinance. For convenience, the ordinance is so worded that the nongrading form is obtained by deleting words referring to grading, which are shown within parenthesis, while the grading form is obtained by deleting the parenthesis signs. The sanitation requirements for grade A restaurants in the grading form are identical with the minimum requirements in the nongrading form. Part 3 is the code which is to be used as the legal interpretation of the ordinance. For each sanitation requirement of the ordinance there is given the public-health reason and a statement of what constitutes satisfactory compliance.

The changes made in this edition of the ordinance and code include the following: a few illustrations are included, explanatory material has been improved and expanded, field tests for cadmium and cyanide are given, rebaking of cream-filled pastries or adequate cooking of the filling is required, running water under pressure is required to be easily accessible to rooms where food is prepared or utensils are washed, lavatories must be supplied with hot and cold running water, the "swab test" technic given is that proposed in June 1943 by the Subcommittee on Food Utensil Sanitation of the A.P.H.A., the restaurant building is required to be ratproofed, and training courses for food handlers are recommended.

JOHN ANDREWS.

Safe Milk Is Good Business. Published by the Kansas State Board of Health, Topeka, Kansas. 1943. 9 pages.

This is a booklet published for distribution to the milk producers of Kansas, illustrated with cartoon drawings. Copies may be obtained by writing to: Milk Sanitation Section, Kansas State Board of Health, Topeka, Kansas.

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 William Boyd Printing Co., Inc., Albany, N. Y., U. S. A.

Subscriptions: The subscription rate is $2.00 per volume. Single copy, 50 cents.

Advertising: All correspondence concerning advertising, reprints, subscriptions, and all other business matters should be addressed to the Managing Editor, W. B. PALMER, 29 NORTH DAY STREET, ORANGE, N. J.

Manuscripts: All correspondence regarding manuscripts, editorials, news items, announcements, and other reading material should be addressed to the Editor, J. H. SHRADER, 23 EAST ELM AVE., WOLLASTON, MASS.

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.

ASSOCIATIONS WHICH HAVE DESIGNATED THE

JOURNAL OF MILK TECHNOLOGY

AS THEIR OFFICIAL ORGAN

ASSOCIATED ILLINOIS MILK SANITARIANS

President, H. W. Weeks.....Champaign, Ill.
Vice-President, Leo Randolph.....Chicago, Ill.
Secretary-Treasurer, P. E. Riley, Illinois Department of Public Health, 1800 West Fillmore St., Chicago, Ill.

CALIFORNIA ASSOCIATION OF DAIRY AND MILK INSPECTORS

President, Max A. Heinzman.....Ventura, Calif.
Vice-President, Fred H. Lucas..Bakersfield, Calif.
Secretary-Treasurer, A. E. Reynolds, State Department of Agriculture, Sacramento, Calif.

CHICAGO DAIRY TECHNOLOGY SOCIETY

President, L. H. Weiner.....Chicago, Ill.
Vice-President, J. E. Rochwell.....Chicago, Ill.
Secretary, P. H. Tracy, University of Illinois, Urbana, Ill.
Treasurer, Ross Spicker.....Chicago, Ill.
Sergeant-at-Arms, Bert Aldrich.....Chicago, Ill.

CONNECTICUT ASSOCIATION OF DAIRY AND MILK INSPECTORS

President, B. E. Bowen.....Waterbury, Conn.
Vice-President, Harold Clark.....Colchester, Conn.
Secretary-Treasurer, H. C. Goslee, State Office Building, Hartford, Conn.

INDIANAPOLIS DAIRY TECHNOLOGY CLUB

President, Dewey Elmore.....Indianapolis, Ind.
Vice-President, C. H. Denny....Indianapolis, Ind.
Treasurer, H. E. Stone.....Indianapolis, Ind.
Secretary, B. E. Horrall.....Lafayette, Ind.
Assistant Secretary, W. K. Moseley, Moseley Laboratory, 315 N. DeQuincy St., Indianapolis, Ind.

IOWA ASSOCIATION OF MILK SANITARIANS

President, Milton E. Held.....Sioux City, Ia.
Vice-President, E. R. Armil.....Davenport, Ia.
Secretary-Treasurer, James R. Jennings, State Department of Health, Des Moines, Ia.

KANSAS ASSOCIATION OF MILK SANITARIANS

President, Lewis Blevins.....Pratt, Kan.
Vice-President, Dr. E. F. Kuhin..McPherson, Kan.
Secretary-Treasurer, W. J. Caulfield, Manhattan, Kan.

MASSACHUSETTS MILK INSPECTORS' ASSOCIATION

President, Dr. Michael G. O'Connor, Springfield, Mass.
Vice-President, George P. Moore, Greenfield, Mass.
Secretary-Treasurer, Robert E. Bemis, Cambridge, Mass.

METROPOLITAN DAIRY TECHNOLOGY SOCIETY

President, O. F. Garrett....New Brunswick, N. J.
Vice-President, A. B. Quencer....New York, N. Y.
Secretary-Treasurer, F. C. Button, New Brunswick, N. J.
Sergeant-at-Arms, F. L. Seymour-Jones, New York, N. Y.

MICHIGAN ASSOCIATION OF DAIRY AND MILK INSPECTORS

President, Albert C. Miller.....Lansing, Mich.
1st Vice-President, Dr. C. S. Bryan, East Lansing, Mich.
2nd Vice-President, H. S. Adams.....Flint, Mich.
Secretary-Treasurer, H. J. Barnum, Health Department, Ann Arbor, Mich.

MISSOURI ASSOCIATION OF MILK SANITARIANS

President, E. R. Garrison.....Columbia, Mo.
Vice-President, C. W. Drumgold....St. Louis, Mo.
Secretary-Treasurer, Glenn M. Young, State Board of Health, Jefferson City, Mo.

NEW YORK ASSOCIATION OF MILK SANITARIANS

President, Iver Mikkelsen.....Pleasantville, N. Y.
Vice-President, Samuel Ahraham, New York City, N. Y.
Secretary-Treasurer, W. D. Tiedeman, New York State Department of Health, Albany, N. Y.

PACIFIC NORTHWEST ASSOCIATION OF DAIRY AND MILK INSPECTORS

President, A. W. Metzger.....Salem, Ore.
Vice-President, E. W. Soper.....Arlington, Wash.
2nd Vice-President, R. D. Bovey.....Boise, Idaho
Secretary-Treasurer, Frank W. Kehrli, Portland, Ore.

PHILADELPHIA DAIRY TECHNOLOGY SOCIETY

President, J. J. Sampey.....Philadelphia, Pa.
Vice-President, Jay D. Girard....Philadelphia, Pa.
Secretary-Treasurer, W. S. Holmes, Philadelphia Dairy Council, 158 North 20th St., Philadelphia, Pa.
Assistant Secretary-Treasurer, Miss Helen A. Walker.....Philadelphia, Pa.

TEXAS ASSOCIATION OF MILK SANITARIANS

President Taylor Hicks.....San Antonio, Texas
1st Vice-President, F. C. Armstrong, Fort Worth, Texas.
2nd Vice-President, R. N. Hancock, McAllen, Texas.
Secretary-Treasurer, G. G. Hunter, Lubbock, Texas.

WEST VIRGINIA ASSOCIATION OF MILK SANITARIANS

Chairman, F. D. Fields, Berkeley County Health Dept.
Secretary-Treasurer, J. B. Baker, Department of Health, Charleston, W. Va.

Transportation Difficulties

Executive Office of the President
OFFICE FOR EMERGENCY MANAGEMENT

The Office of Defense Transportation
Joseph B. Eastman, Director

July 15, 1943

To Executives of National, State, Regional and District Organizations:

Director Joseph B. Eastman of the Office of Defense Transportation issued a public statement today, in which he reiterated an earlier request for the cancellation of conventions and similar group meetings because of the strain which such travel-stimulating events impose on our war-burdened public transportation facilities.

In order that you may be fully informed as to the impact of convention travel on the present transportation situation, and as to the attitude of the Office of Defense Transportation on this problem, I am sending you a copy of the full text of Mr. Eastman's statement.

I should like to re-emphasize one point covered in the statement, i.e., the Office of Defense Transportation cannot undertake to assess the essentiality of any convention or other group meeting. The decision as to whether or not a convention shall be held must be made by the appropriate officials of each organization without the benefit of special advice from this office. Our judgment, based wholly on transportation considerations, is that all events which stimulate travel should be cancelled for the duration.

After reading the attached statement, I hope you will find it possible to initiate action which will add your organization to the list of those showing leadership in and full cooperation with our travel conservation program.

Very truly yours,

H. F. McCARTHY, *Director*
Division of Traffic Movement

P.S. If your organization has already cancelled the convention or other meetings which, according to our present information, is scheduled to be held this year, please disregard this letter and accept my congratulations on the action taken.

OFFICE OF WAR INFORMATION

Office of Defense Transportation ODT-312

Joseph B. Eastman, Director of the Office of Defense Transportation, today renewed his request for cancellation of conventions and similar group meetings.

Convention travel, Mr. Eastman said, is interfering with military and essential war business travel. He asserted that the passenger transportation problem was now so serious that even those organizations whose conventions would be devoted to matters closely concerned with the war might contribute more to the war effort by canceling their meetings.

Text of Mr. Eastman's statement follows:

"Some months ago I asked for cancellation in 1943 of all conventions and similar group meetings that would not actually contribute in an important way to winning of the war. Many organizations have responded patriotically to this request and have canceled their plans for meetings this year. Others have not.

"Conventions, even small conventions, produce concentrations of passenger traffic which severely impair the ability of the railroads and bus lines to provide adequate passenger service for military and essential war business travel. The passenger transportation problem is now so serious that I feel obliged to renew and reiterate, in the strongest terms, my request for cancellation of all such gatherings.

"The present huge volume of passenger traffic is taxing the capacity of the railroads and bus lines. Equipment to handle additional traffic cannot be obtained. The volume of military travel, moreover, is rising and will continue to rise. More than one-half of all Pullman sleeping cars, about one-third of all railroad day coaches, are now needed all the time to handle organized troop movements in special trains and special cars. The number of cars needed for troop movements is increasing. Facilities for accommodating civilian rail travel are decreasing.

"The Office of Defense Transportation has consistently discouraged travel-stimulating events and all unnecessary civilian travel. With essential travel demands increasing, and with an outlook for continued increases in future months, our responsibilities permit no other policy. Maximum conservation of passenger travel facilities for the duration of

the war is necessary to enable the railroads and bus lines to discharge their military and essential business travel responsibilities.

"The time clearly has come for officers and members of organizations scheduling conventions, or other group meetings involving intercity travel, to ask themselves again whether they are justified in going ahead with their plans. They must consider now not alone the question of whether holding the convention will contribute in an important way to winning of the war. They must also answer conscientiously the further question of whether cancellation of the convention will not accomplish more for the war effort than anything that can be gained by holding it. And in making their decision, they should bear in mind that many organizations doing important war work have found in the convention-by-mail a satisfactory wartime alternative for the regular annual gathering.

"Efficient performance of essential war transportation services by our railroad and bus systems is of paramount importance. Anything that interferes, as conventions interfere, with provision of adequate passenger service for travelers on necessary war business and for our men and women in uniform has a seriously detrimental effect on the war effort.

"I know that provisions of the constitutions or by-laws of some organizations stipulate the holding of annual conventions, and that cancellation of the meetings may raise complications with regard to the tenure of officers and other matters. However, this is wartime. The emergency calls for emergency procedure. The action of many organizations in canceling conventions required by a literal reading of their governing rules indicates that such obstacles to compliance with the ODT request for cancellation can be surmounted where there is full appreciation of the pressing nature of the emergency and a real desire to cooperate.

"The fact that one organization or another has adhered to its convention plans does not give other organizations a valid reason for thinking they should do likewise. Each organization must make its own independent decision. The Office of Defense Transportation cannot pass upon the essentiality of any proposed meeting. It can only emphasize the serious burdens which convention and group-meeting travel imposes on transportation and request voluntary action by those who have it in their power to eliminate such travel.

"Members of an organization which cooperates with the ODT request and cancels its convention, instead of feeling aggrieved if another organization does not act similarly, should take pride in the fact that their group has shown leadership in supporting the Government's efforts to achieve, on a voluntary basis, the necessary conservation of our limited travel facilities.

"I must say to all organizations still intending to hold conventions this year that their cooperation in our travel conservation program is urgently needed to help alleviate a very difficult passenger transportation situation. That is why I earnestly request them to reconsider their plans and cancel their meetings. By doing this of their own accord, on their own initiative, they will be acting in true democratic fashion and will be helping to avert the necessity for imposing a system of restrictions on the free movement of people that would be foreign to our whole tradition."

Copied-A-7/20/43

OFFICE OF DEFENSE TRANSPORTATION
WASHINGTON, D. C.

Joseph B. Eastman
Director

August 7, 1943

Mr. C. S. Leete, Secretary-Treasurer
International Association of Milk Sanitarians, Inc.
State Department of Health
Albany, New York

Dear Mr. Leete:

Thank you very much for your reply to our letter of July 15.

It is gratifying to learn that your organization has found it possible to cooperate in the travel conservation program of the Office of Defense Transportation. Your leadership in this matter is deeply appreciated.

Let me assure you that the steps you have taken to relieve the pressure on our limited passenger transportation facilities constitute a valuable contribution to the war effort.

Very truly yours,
(sgd) H. F. McCARTHY, *Director*
Division of Traffic Movement

Association News

New York State Association of Milk Sanitarians

At the request of the Office of Defense Transportation the Executive Committee of the New York State Association of Milk Sanitarians cancelled the Annual Meeting previously scheduled to be held at the Hotel Syracuse in Syracuse, New York, on September 23 and 24, 1943.

Persons scheduled to speak at that meeting have been requested to submit papers. It is the intention to publish these papers in the form of an Annual Report.

Iowa Association of Milk Sanitarians

At the annual meeting of the Iowa Association of Milk Sanitarians, a suggestion was made that one day regional meetings be held in various parts of the State. Accordingly, about ten of us from the area of the Mississippi River met recently in Davenport. Each in turn threw his local problem into the hopper for the discussion of the whole group. There was no prepared program, only practical every day problems were discussed.

All of those attending voted to return for a similar session this fall.

Another such meeting is contemplated for Central Iowa in the near future.

JAMES R. JENNINGS,
Secretary-Treasurer

The Thirty-Second Annual Meeting has been

CANCELLED

(see pages 257 and 308)

New Members

INTERNATIONAL ASSOCIATION OF MILK SANITARIANS

ACTIVE

Buchbinder, Dr. Leon, Bacteriologist-in-Charge, Laboratory for Sanitary Microbial Examinations, City Health Department, 125 Worth St., New York City.

Hummer, Capt. Robert L., Station Veterinarian, U. S. Army, Napier Field, Ala.

Lawson, George Wilbur, Director of Milk Control, Chattanooga-Hamilton County Health Dept., City Hall, Room 48, Chattanooga 2, Tenn.

Patterson, Francis, Milk Sanitarian, City Health Department, Rocky Mount, N. C.

Vaill, Mrs. Elizabeth B. C., Chief Microbiologist, Bureau of Laboratories, Department of Health, 17 Haynes St., Hartford 3, Conn.

ASSOCIATE

Baker, J., c/o Messrs. A. Joyce & Co. Pty., Ltd., 91-103 Leveson St., North Melbourne, Victoria, Australia.

Benson, J. H., Laboratory Technician, Southern Dairies, Inc., Atlanta, Ga.

Bonney, Alson S., Quality Control, Abbotts Dairies, 518 Lombardy Road, Drexel Hill, Penn.

Ensley, Miss Margaret, Sealtest Supervisor, Southern Dairies, Inc., Asheville, N. C.

Fullington, Page D. Sealtest Lab. Supervisor, Southern Dairies, Inc., Norfolk, Va.

Heald, J. H., Sealtest Supervisor, Southern Dairies, Inc., Winston-Salem, N. C.

Hochsprung, E. A., Sanitarian, Whitman County Health Dept., Colfax, Wash.

Johnson, Richard C., Health Inspector, City Hall, Albert Lea, Minn.

Joslin, Mrs. Bobby S., Sealtest Laboratory Technician, Southern Dairies, Inc., Knoxville, Tenn.

Martin, A., c/o J. W. Riddell, Pty. Ltd., Kent St., Ascot Vale, Melbourne, Victoria, Australia.

Miller, Clyde O., Fraim's Dairies, 707 Bellevue Rd., Wilmington 280, Delaware.

Moss, Clarence M., Asst. Sanitarian, U.S. P.H. Service, District No. 1, 15 Pine St. 5, New York City.

Rae, Frances, Laboratory Technician, 60 M St. N.E., Washington, D. C.

Shimp, R. C., Laboratory Technician, Southern Dairies, Inc., Jacksonville, Fla.

Snyder, William, Laboratory Director, Hershey Chocolate Corp., 241 Mifflin St., Lebanon, Penn.

Stone, Gordon Curtis, Research Asst., Columbia University School of Medicine, 630 W. 168th St., New York City 32, N. Y.

Swanson, Dr. Leonard E., Camp Veterinarian, U. S. Army, Sales Office, Camp Blanding, Fla.

Webber, F. Horace, Baker Perkins Inc., Lyndhurst, Stanmer Gardens, Brighton 6, England.

Westman, Dr. Ragnar, Acting Commissioner of Health, Dept. of Health and Sanitation, Seattle, Wash. (succeeds Dr. Carroll).

White, H. W., Chemist, 2804 Ensley Ave., Birmingham, Ala.

Wyatt, Dr. R. L., Director, Calhoun County Health Dept., Calhoun City, Miss.

AFFILIATE

Adams, D. E., Sanitarian, Champaign-Urbana Health Dept., 505 South Fifth St., Champaign, Ill.

Allen, E. Dorr, Dairy Inspector, Chicago Board of Health, 8110 Evans Ave., Chicago, Ill.

Cameron, J. Robert, Washtenaw County Health Dept., Ann Arbor, Mich.

Dinsmore, Arthur, Department of Health, 3919 John R. St., Detroit, Mich.

Eklund, Edmund S., Sales Representative, Near's Food Co. Inc., R. R. No. 2, Box 40, Hampshire, Ill.

Fox, Irwin C., 1409 Hurlburt Ave., Detroit, Mich.

Gregarek, F. J., Detroit Dept. of Health, 3919 John R. St., Detroit, Mich.

Hannen, Otto J., Country Dairy Inspection Section, Chicago Board of Health, 1250 Sedgwick St., Chicago, Ill.

Hazey, George, Department of Health, Marine City, Mich.

Johnson, R. E. Pet Milk Co., Hudson, Mich.

Kearney, Frank R., Country Dairy Inspection Section, Chicago, Board of Health, 28 E. 85th St., Chicago, Ill.

Larson, Peter J., City Dairy Inspection Section, Chicago Board of Health, 1944 North Richmond St., Chicago, Ill.

Luscombe, Merton, Michigan Milk Producers Assoc., Grass Lake, Mich.

Menary, Dr. A. R., Milk Sanitarian, City Hall, Cedar Rapids, Iowa.

Nolan, James B., Chief Clerk, Dairy Section, Chicago Board of Health, 3847 No. Kedvale Ave., Chicago, Ill.

Olson, Walter L., 14312 Cruse St., Detroit, Mich.

Peacock, Robert, Sales Representative, Diversey Corp., 53 W. Jackson Blvd., Chicago, Ill.

Propst, Erhardt, Jr., Fieldman, Lakeview & Dairyland Coop. Milk Assn., 1012 Tenth St., Watertown, Wis.

Reynolds, A. D., Michigan Milk Producers Assoc., Grass Lake, Mich.

Saunders, Lonnie, 6427 Vinewood St., Detroit, Mich.

Staniszewski, Bron, 7321 Wetherby St., Detroit, Mich.

Stiller, Miss Elizabeth, Laboratory Technician, Union Dairy Co., 1082 West Macon St., Decatur, Ill.

Summar, Anthony, 703 E. Lafayette St., Detroit, Mich.

International Association of Milk Sanitarians, Inc.

CONSTITUTION

Adopted October 16, 1911
(Amended October 20, 1932; October 15, 1936, and October 25, 1939)

ARTICLE I

This Association shall be known as the INTERNATIONAL ASSOCIATION OF MILK SANITARIANS, INC.

ARTICLE II

OBJECT

The object of this Association shall be to develop uniform and proper supervision and inspection of dairy farms, milk and milk products establishments, and milk and milk products; to encourage the improvement in quality of dairy products and the technological development of dairy equipment and supplies; and to disseminate useful information regarding dairy sanitation, technology, inspection, and administration.

ARTICLE III

MEMBERSHIP

PARAGRAPH 1. There shall be two classes of membership in this Association: ACTIVE and ASSOCIATE.

PARAGRAPH 2. The professional and experiential qualifications of the ACTIVE members, in addition to the distinctions specified in the following two paragraphs, shall be:

(A) An undergraduate degree or its equivalent;

(B) Actual experience of at least three (3) years in dairy inspection, supervision, teaching, or technology; provided, however, that all persons who at the time of the adoption of this amendment are members of the Association shall retain their present status.

PARAGRAPH 3. The ACTIVE membership shall be composed of persons who are officially engaged in dairy or milk inspection, or the laboratory control of, or the administration of such function for any country or any subdivision thereof, and of persons who are officially engaged in research or educational work related to dairy or milk inspection for any country or subdivision thereof, and who possess the qualifications described in Paragraph 3 of this Article.

PARAGRAPH 4. The ASSOCIATE membership shall be composed of any persons, not eligible for Active membership, who are interested in the promotion of dairy sanitation and technology. Associate members shall not be eligible to vote, serve as officers, hold the chairmanship of any committee, serve on the Resolutions Committee, or serve as majority members of any committee of this Association.

PARAGRAPH 5. Any person may make application for ACTIVE or ASSOCIATE membership to the Secretary-Treasurer, and if application is accepted by the Membership Committee, said applicant may become an Active or Associate member, as the case may be, upon payment of the annual membership dues of three dollars ($3) for ACTIVE membership, or two dollars ($2) for ASSOCIATE membership.

OFFICERS

The officers of this Association shall be a President, three Vice-Presidents, a Secretary-Treasurer, and two Auditors, who shall be elected by a majority ballot at the Annual Meeting of the Association, and shall hold office for one year or until their successors are elected. An Executive Board, which shall direct the affairs of the Association when not in Annual Session, shall consist of the President, the three Vice-Presidents, and the Secretary-Treasurer.

AMENDMENTS

This Constitution may be amended by a two-thirds affirmative vote of those Active members of the Association who register their votes with the Secretary. Any member proposing amendments must submit the same in writing to the Secretary-Treasurer at least sixty days before the date of the Annual Meeting, and the Secretary-Treasurer shall at once notify all members that the proposed amendments will be open for discussion at the Annual Meeting immediately succeeding such notification. After discussion at the Annual Meeting such amendments, upon a majority affirmative vote of the members in attendance, shall be, within 90 days, submitted to the entire membership of the Association by the Secretary-Treasurer. All members voting on such amendments shall, within 60 days after receipt of such notification, register their vote in writing with the Secretary-Treasurer on blanks furnished by the Association. These ballots shall be opened and recorded by the Executive Committee and the results shall be reported by the Secretary-Treasurer at the next Annual Meeting: and if the amendments are passed they shall become a part of the Constitution from the date of such report by the Secretary-Treasurer at the Annual Meeting.

BY-LAWS

ADOPTED OCTOBER 25, 1913

ORGANIZATION

The Constitution shall be the basis of government of this Association.

ARTICLE 1

MEMBERSHIP

SECTION 1. Any person eligible for membership under the Constitution who shall file an official application, accompanied by the first annual membership dues of three dollars, and whose application for membership shall have the approval of the Membership Committee, may become a member of the Association for one year.

SECTION 2. Any person having once become a member may continue membership in the Association so long as the annual membership dues are paid. Any member who shall fail to pay annual dues within thirty days after having been notified by the Secretary that said dues are due and payable, shall be dropped from membership. Any member so dropped may, within ninety days, be reinstated by the Membership Committee, upon application filed in due form and accompanied by the annual membership dues for that year.

SECTION 3. A member of the Association may be expelled for due cause upon recommendation of the Membership Committee, and a majority vote of the members at any annual meeting. Any member so expelled shall have refunded such *pro rata* part of his membership dues as may not be covered by his term of membership.

HONORARY MEMBERS

SECTION 4. Members of the Association may elect as honorary members, at any stated meeting, on the recommendation of the Membership Committee, those whose labors have substantially added to the scientific knowledge of milk supply betterment, or those who have been of pronounced practical influence in the improvement of the milk industry. From such members no dues shall be required. They shall have the privilege of attending the meetings of the Association, but they shall not be entitled to vote.

ARTICLE 2

OFFICERS

SECTION 1. The officers of this Association shall be a President, a First, Second, and Third Vice-President, a Secretary-Treasurer, and two Auditors, who shall be chosen by ballot at the annual meeting of the Association, and shall hold office for one year, or until their successors are duly elected.

SECTION 2. The Executive Board shall consist of the President, the three Vice-Presidents, and the Secretary-Treasurer.

SECTION 3. The Membership Committee shall consist of the President, the three Vice-Presidents, and the Secretary-Treasurer.

ARTICLE 3

DUTIES OF OFFICERS

SECTION 1. It shall be the duty of the President to preside at all meetings of the Association. He shall examine and approve all bills previous to their payment, appoint all committees unless otherwise directed by vote of the Association, and perform such other duties as usually devolve upon a presiding officer, or are required of him by the Association.

SECTION 2. The Vice-Presidents, in the order of their selection, shall perform the duties of the President in his absence.

SECTION 3. The Secretary-Treasurer shall record the proceedings of the Association. He shall keep a list of members, and collect all moneys due the Association, giving his receipt therefor. He shall record the amount of each payment, with the name and address of the person so paying. He shall faithfully care for all moneys entrusted to his keeping, paying out the same only with the approval of the President, and taking a receipt therefor. He shall, immediately after his election to office, file with the President of the Association a bond in the sum of five hundred dollars, the expense of which shall be borne by the Association. He shall, at the annual meeting, make a detailed statement of the financial condition of the Association.

It shall also be the duty of the Secretary-Treasurer to assist in making arrangements and preparing a program for the annual meeting, and to compile and prepare for publication all papers, addresses, discussions and other matter worthy of publication, as soon as possible after the annual meeting.

SECTION 4. The full management of the affairs of the Association when the Association is not in session shall be in the hands of the Executive Board, as provided in the Constitution.

SECTION 5. It shall be the duty of the Auditors to examine and audit the accounts of the Secretary-Treasurer and all other financial accounts of the Association, and to make a full report of the condition of the same at the annual meeting.

ARTICLE 4

MEETINGS

SECTION 1. The annual meeting of the Association shall be held at such time and place during the month of October of each year or at such other time as shall be designated by the Executive Board.

SECTION 2. Special meetings of the Association may be called by the Executive Board, of which due notice shall be given to the members by the Secretary.

SECTION 3. Quorum.—Twenty-five per cent of the membership shall constitute a quorum for transaction of business at any annual meeting. Voting by proxy shall not be permitted.

ARTICLE 5

These By-Laws may be altered or amended at any annual meeting of the Association. Any member proposing amendments must seasonably submit the same in writing to the Secretary-Treasurer, who shall then give notice of the proposed amendments by mail to each member of the Association at least thirty days previous to the date of the annual meeting.

Application for Membership

.....194.....

TO THE INTERNATIONAL ASSOCIATION OF MILK SANITARIANS, INC.:

Application for ☐ Active ☐ Associate Membership

(Membership includes subscription to Journal of Milk Technology)

Name .....

Address (mailing) .....

PRESENT POSITION

Title ..... Length of Service .....

Organization .....

PREVIOUS POSITION

Title ..... Length of Service .....

Organization .....

Title ..... Length of Service .....

Organization .....

GIVE FOLLOWING INFORMATON

Education: Name Schools attended	Years of Attendance	Graduate	Degree
College			
University			
Technical School			
Other			

Give additional information you desire to have considered

.....

.....

.....

Application endorsed by

Active or Associate member } .....

.....

Mail this application and annual dues, $3.00 Active, $2.00 Associate, which includes $1.00 for subscription to Journal of Milk Technology:

C. SIDNEY LEETE, *Secretary-Treasurer,*
International Association of Milk Sanitarians, Inc.
State Department of Health, Albany, N. Y.

Active Membership open to Government officials and employees.

Associate Membership open to members of industry and others.

"Dr. Jones" Says—*

THAT old expression about getting "in a rut"—I s'pose there's an awful lot of folks that've grown up since the horse and buggy days that it don't mean much to 'em—that expression don't. All their roading's been in an automobile on hard roads. But I can remember back when, in the country, it was all dirt roads. Most everybody drove in the same track and along in the spring they'd get soft, the roads would, and then they'd freeze and you'd have ruts five or six inches deep. If you had to pass somebody, it'd be all your life was worth to get out of 'em.

It reminds me of that story about the farmer that his wife'd gone off her head. He said he couldn't understand how anything could've happened to her mind; she hadn't been off'm the farm in three years.

But getting "in a rut"—the way we use the expression it means getting in the habit of doing the same things over and over in just the same way day after day.

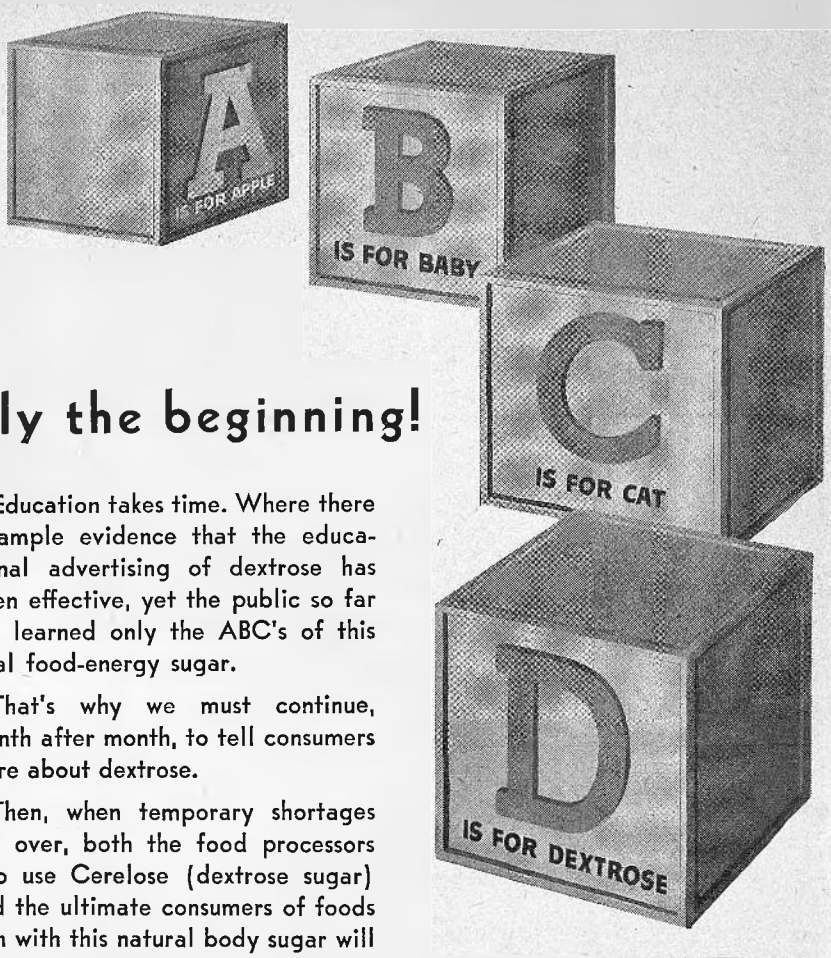
The old saying "nature abhors change"—that goes for human nature, too. A lot of folks, when they get in a rut, they feel sort of fearful about getting out of it and doing something different—like we used to wonder if the old buggy was going to tip over if we got out on the side. We didn't have any choice, though. We couldn't all stay in the same ruts and pass each other, so we had to take a chance. And we usually got by all right. Yes, there's a lot of folks—it makes 'em nervous just to think about doing something different than they've been accustomed to—or doing it a different way. I suppose that's the main reason why there's usually opposition to innovations.

But variety, they say, it's "the spice of life." A spice—that's supposed to add flavor and give you an appetite and so on. And that's the way it seems to work. The fellow that stays in the rut can only go where the rut takes him, and just following somebody else's wheel-tracks ain't very inspiring. He not only loses his interest, but he's liable to lose his nerve at the same time.

The fellow that refuses to be bound by ruts—he may use 'em when it serves his purpose, but he ain't afraid to pull out and make his own track—that's initiative. Somebody said we ought to do something every day that we don't want to do. Anyway, when we're confronted with jobs we're fearful of, it's a challenge. Going ahead in spite of our fears—it's a lot easier next time. And these young folks—it may make all the difference between success and failure. "Anything to do with health?" Well, mental hygiene is health, ain't it?

PAUL B. BROOKS, M.D.

* *Health News*, New York State Department of Health, Albany, May 3, 1943.



Only the beginning!

Education takes time. Where there is ample evidence that the educational advertising of dextrose has been effective, yet the public so far has learned only the ABC's of this vital food-energy sugar.

That's why we must continue, month after month, to tell consumers more about dextrose.

Then, when temporary shortages are over, both the food processors who use Cerelose (dextrose sugar) and the ultimate consumers of foods rich with this natural body sugar will benefit through persistent educational advertising.

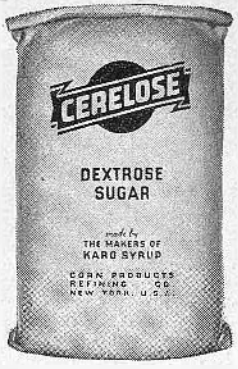
CORN PRODUCTS SALES CO.
17 Battery Pl., New York, N. Y.

Tune in

STAGE DOOR CANTEEN

Every Thursday 9:30 to 10:00 p.m., E. W. T.

Columbia Network, Coast-to-Coast



CERELOSE *is* DEXTROSE

Index to Advertisers

GLASS BOTTLES FOR MILK MEAN:

...and Owens-Illinois Duraglas Dairy Containers mean:

1. Quality bottles of greater strength for high trippage
2. A complete line of finishes and styles to fit your needs
3. Traditional Owens-Illinois service

OWENS-ILLINOIS *Complete Dairy Service*

TOLEDO OHIO

WHERE QUALITY PREDOMINATES

for particulars, see page 306

The Thirty-Second Annual Meeting has been

CANCELLED

(see pages 257 and 308)

DIFCO

LACTOBACILLUS ACIDOPHILUS

Isolation and Cultivation

•

Bacto-Trypsin Digest Agar is an excellent culture medium for propagation of *Lactobacillus acidophilus.* The medium is prepared according to the formula of Cheplin. It is widely used for estimating the degree of intestinal implantation of *L. acidophilus* and is well suited for isolation of acidophilus strains and for carrying stock cultures.

Bacto-Tomato Juice Agar is prepared according to the formula of Kulp and White. The ability of this medium to support luxuriant and characteristic growth of *L. acidophilus* makes it particularly well adapted for use in establishing the number of viable organisms in acidophilus products. This medium is also used extensively in determining the degree of implantation of the organism.

Bacto-Skim Milk when prepared for use is an excellent medium for propagation of stock cultures of *Lactobacilli.* A 10 per cent solution of this product is equivalent to a high grade skim milk.

Bacto-Peptonized Milk contains degradation products of the proteins, albumins and globulins of milk. It supports rapid and luxuriant growth of the *Lactobacilli.*

Specify "DIFCO"

THE TRADE NAME OF THE PIONEERS

In the Research and Development of Bacto-Peptone and Dehydrated Culture Media

---

DIFCO LABORATORIES
INCORPORATED
DETROIT, MICHIGAN

Printed in U. S. A.