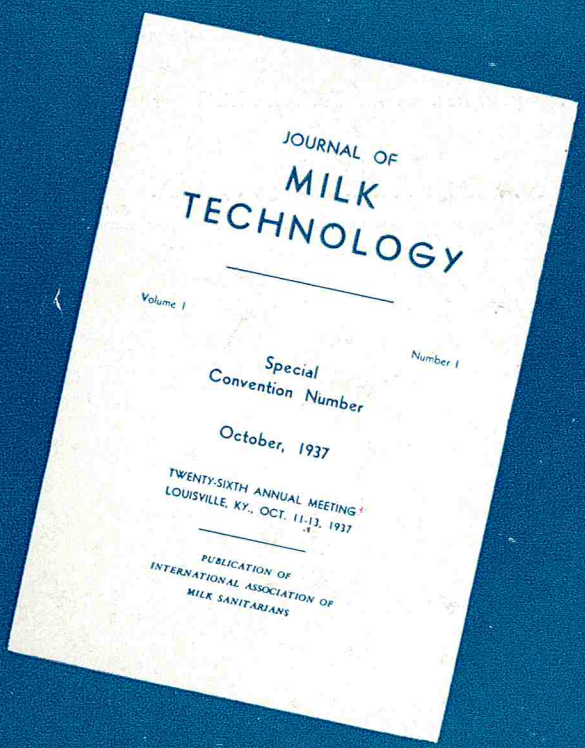
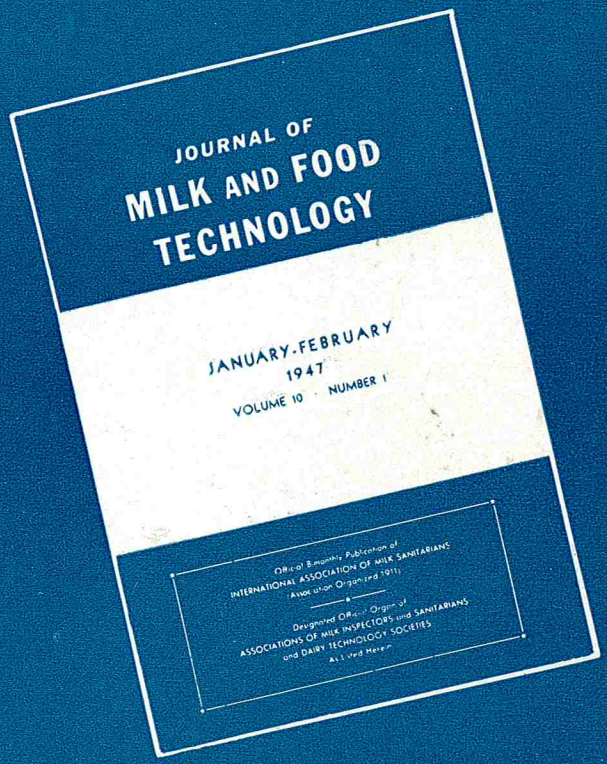
VOLUME 20 NO. 9
SEPTEMBER, 1957

20th Anniversary Issue

Journal of

MILK and FOOD TECHNOLOGY





Official Publication

International Association of Milk and Food Sanitarians, Inc.

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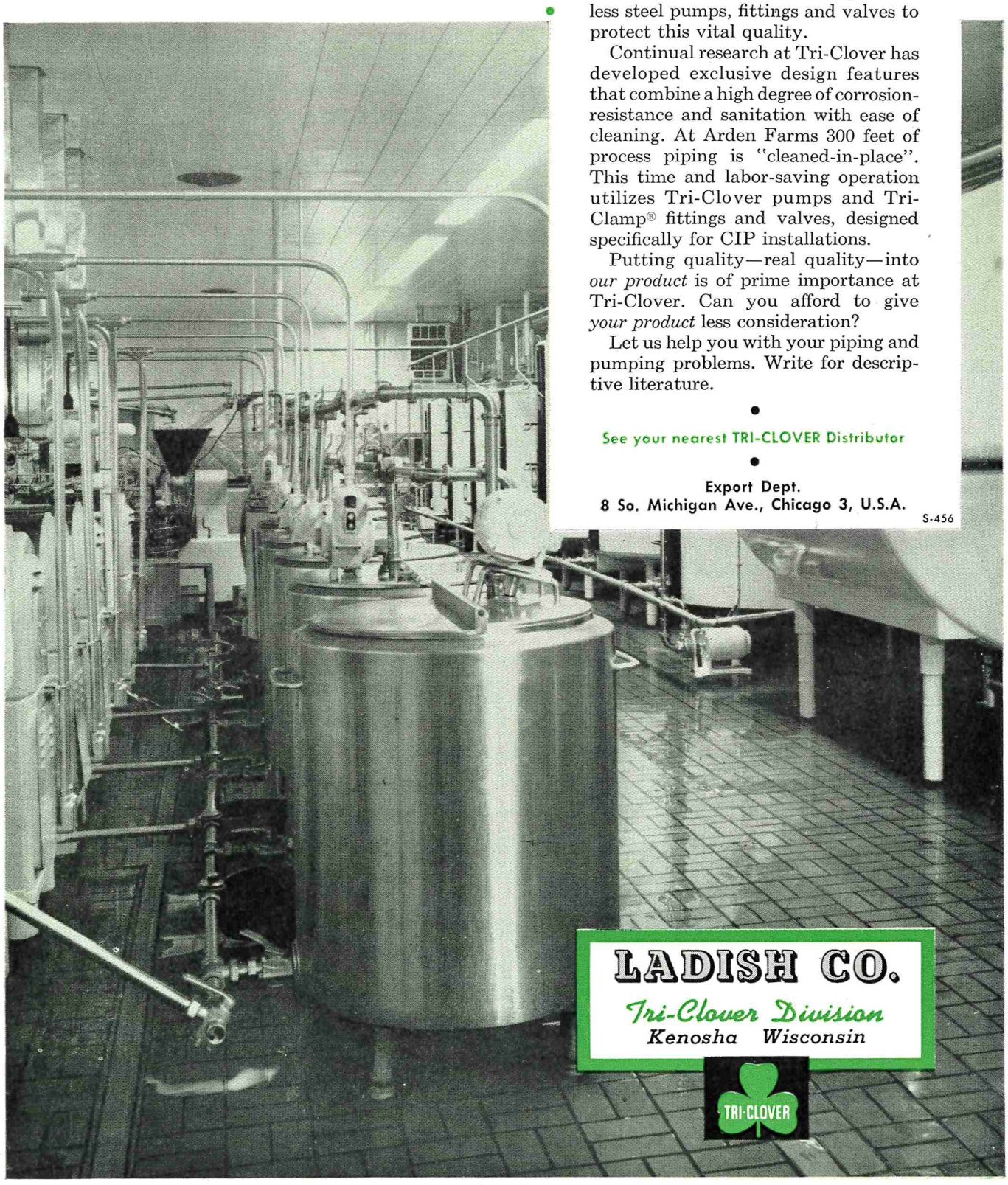

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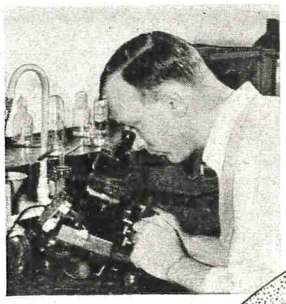

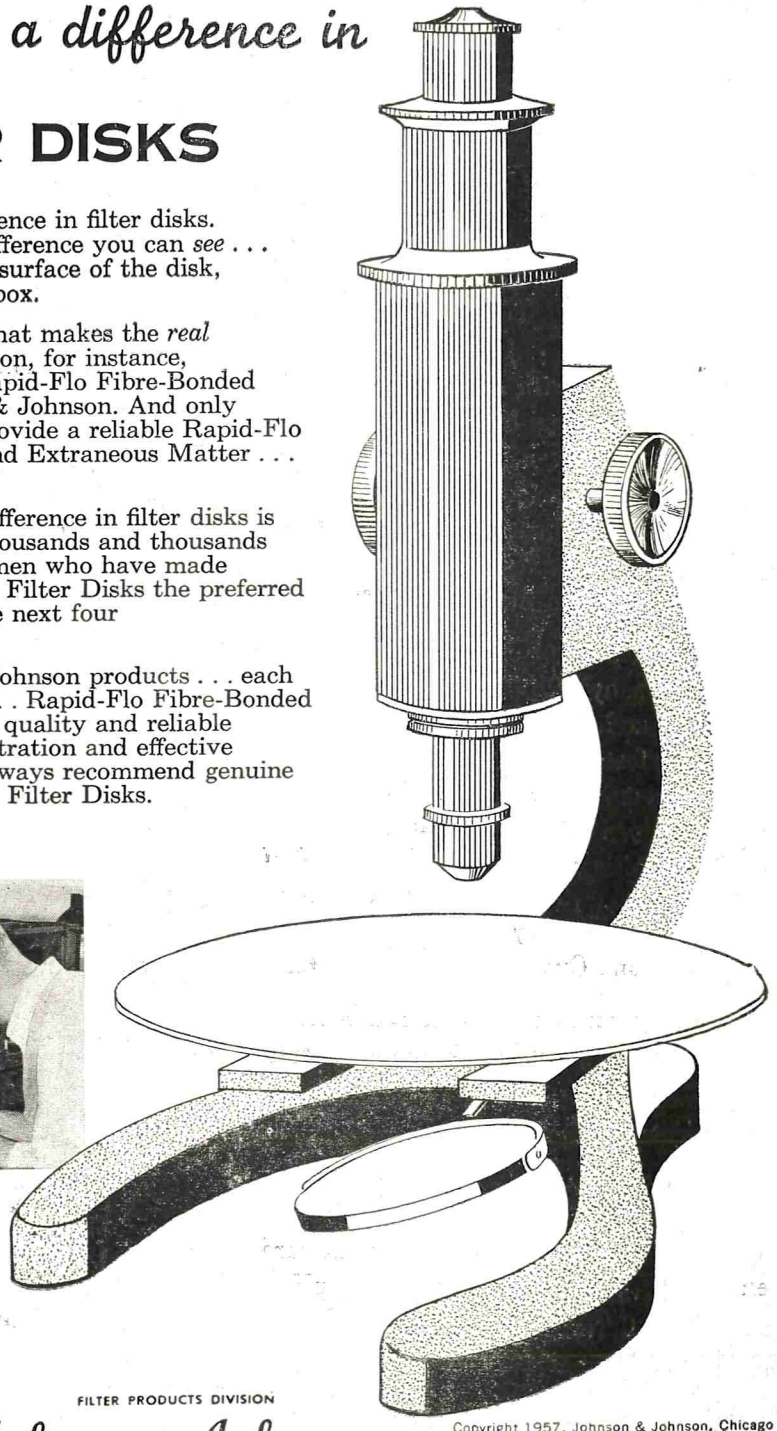

FILTER PRODUCTS DIVISION

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Non-Corrosive PENNSAN... a New PENNSALT Concept in Bulk Tank Sanitizers

Here's a bulk tank sanitizer with nine intensive years of research and field testing behind it. Pennsan, Pennsalt's new non-corrosive sanitizer, is a light amber liquid with orthophosphoric acid and an anionic wetting agent as the active ingredients. It is considered to be a new concept in this field, offering superior benefits over other types of products on the market today.

The bactericidal properties of Pennsan have been established by the company's Whitemarsh Laboratories with the widely-used and accepted Weber-Black technique. The tests show faster kill on specified organisms, in every case, than required by the revised Appendix F, U.S.P.H.S. Ordinance and Code. It is equally effective on psychrophilic bacteria. Further proof of highly effective sanitizing power has been shown in rigid field tests under actual dairy farm conditions by a well known university and Quality Control Laboratory.

It has further been established by Whitemarsh Laboratories that Pennsan does not attack stainless steel. These findings have been confirmed by manufacturers of bulk tanks and dairy equipment.

Pennsan also retains its bactericidal effectiveness even after drying on stainless steel for as long as 24 hours. Additionally, Pennsan is particularly effective in hard water, as well as cold water; and due to the low pH of use solutions, the costly problems of films and milkstone caused by hard water salts are eliminated.

Pennsan is especially recommended for sanitizing bulk farm tanks and tank trucks. It is equally effective on utensils, and all dairy and food plant equipment after thorough cleaning. These recommendations are supported by quality control tests conducted by an independent laboratory serving the dairy industry in a five-state area.

Contents are stated on the label. According to the manufacturer, Pennsan* should be used one ounce to one gallon of water. This use solution has a pH of 2.1 and contains 215 p.p.m. anionic wetting agent.

A test kit is available for determining the parts per million of the sanitizing agent in the use solution of Pennsan. The solution should be discarded when test indicates available sanitizer is 100 p.p.m. or less.

An authority in the field of preventive medicine has already reported that a use solution of Pennsan imparts only slight and temporary irritation of the cornea when tested in the eyes of rabbits. The effect is compared to that of soap.

**A trade-mark of Pennsalt Chemicals Corporation.*

Pennsalt Chemicals

Complete literature on the new Pennsan is available from the manufacturer. Write to B-K Department 478. Pennsalt Chemicals, 3 Penn Center, Philadelphia 2, Pa.

An advertisement printed as a service to dairy scientists by the Pennsalt Chemicals Corporation, 3 Penn Center, Philadelphia 2, Pa.

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"Instructions to Contributors" can be obtained from the Editor for the use of contributors of papers.

Journal of

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INCLUDING MILK AND FOOD SANITATION

Official Publication

International Association of Milk and Food Sanitarians, Inc.

REG. U.S. PAT. OFF.

Vol. 20 September No. 9

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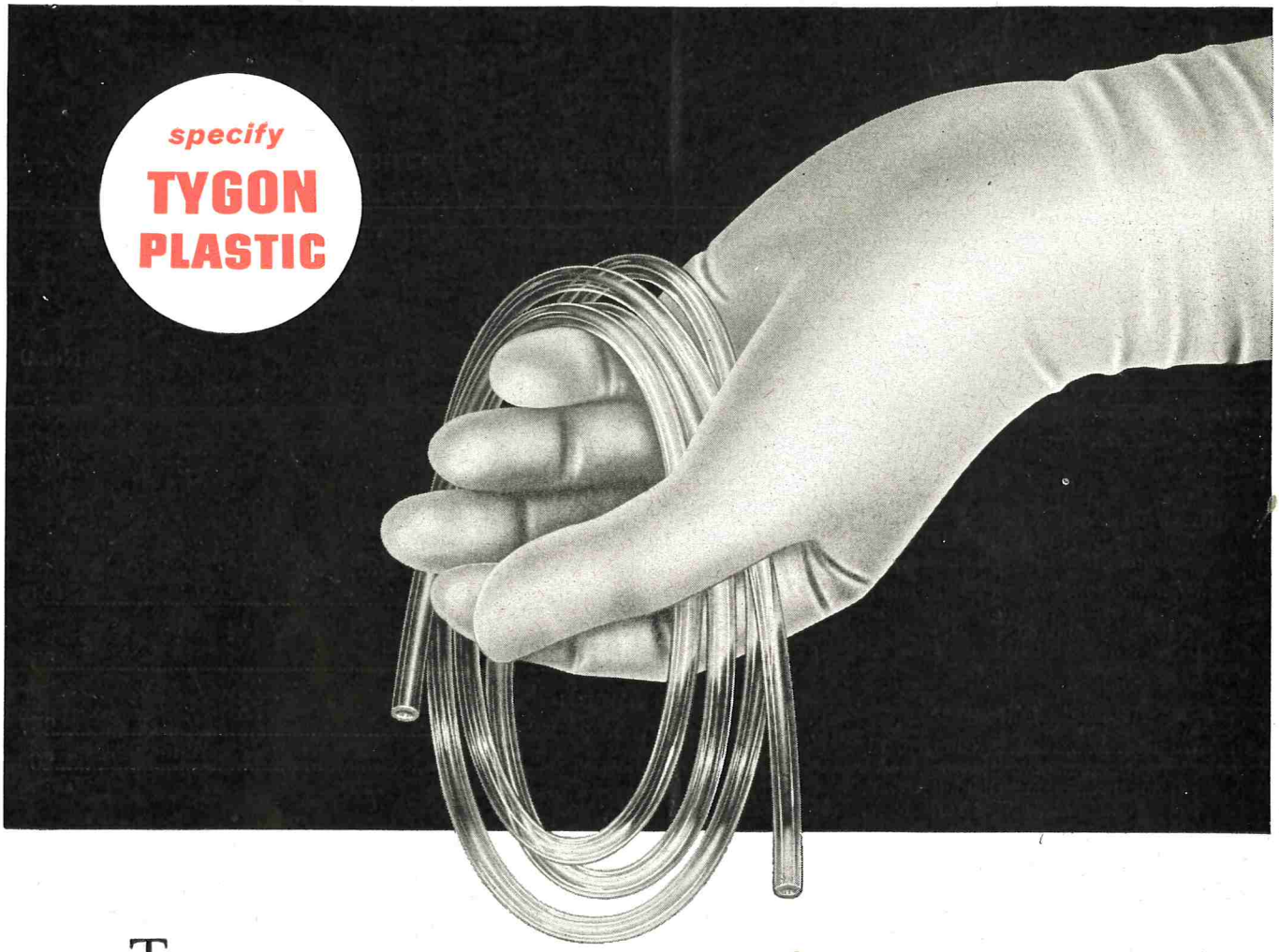
where the need is *Critical*



THERE are some fields of industry, some professions, where more than ordinary care is required. Food is one, medicine another, chemical research a third. Here purity in its truest sense must be enveloped with meticulous care every step of the way.

Relatively minor elements of equipment often play a vital part. For example, if the tubing used to transport liquid food should be attacked by one of the food chemicals trouble could be serious; a life could be endangered if the wrong tubing were used to convey blood or blood plasma; a research project could fail if contaminants leached out to spoil a solution.

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says Marvin Bush, Asst. General Manager
Bush Dairy Company
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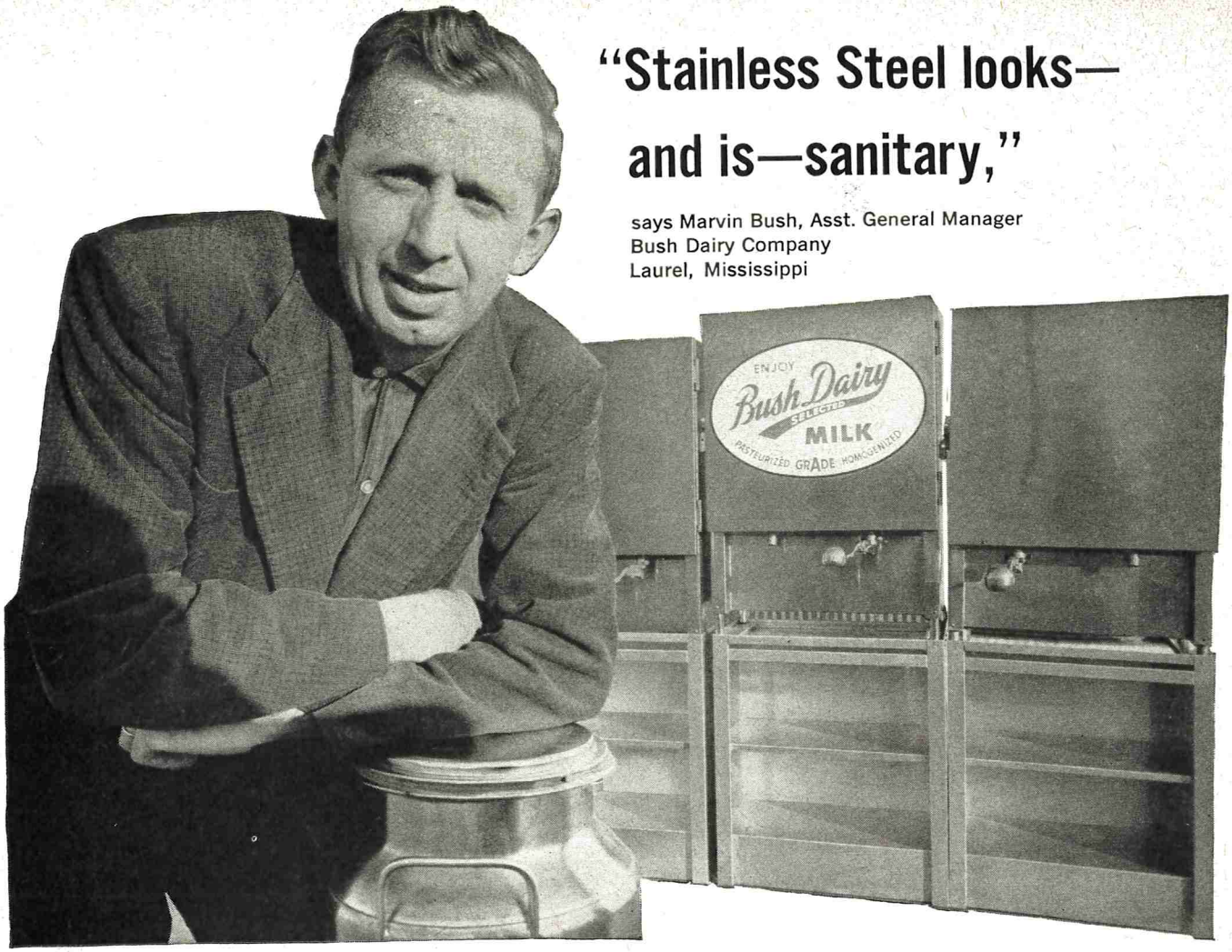

When the Bush Dairy Company decided to install Stainless Steel dispensers in the restaurants they served, the resulting advantages were many: Profits increased by 20%, work time was reduced by 20%, milk sales increased by 10 to 40%, and personnel costs were reduced by 50%. But they also discovered another very important advantage to anyone handling a quality and perishable product like milk . . . Stainless Steel is a genuinely *sanitary* material, easy to clean and keep clean.

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For more information on Stainless Steel Milk Dispensers and Stainless Steel Dispenser Cans, just send in the coupon.

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UNITED STATES STEEL

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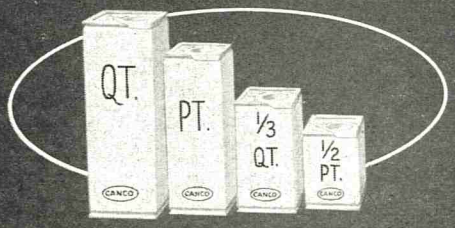
. . . because they save refrigerator space, minimize "clutter," and lower clean-up costs!

Canco cartons help the cafeteria manager make his lunchroom more attractive, more efficient. Because they're disposable, there are no empties to collect, store and return.

Cafeteria patrons prefer Canco cartons, too—in all of the popular sizes. For this superior container is much easier to open and provides "controlled pouring," is sturdy, handsome, sanitary.

If you are a public health official, you can take pride in the fact that fresh milk is now available almost everywhere in Canco disposable milk containers. Much credit for this advance goes to public health officials, who early recognized the disposable container as a great milestone on the road to better milk distribution.



THE PREFERRED CARTON . . . KNOWN BY THE FAMOUS CANCO OVAL

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In accordance with U.S. Public Health Service recommendations, more and more State agencies are accepting quaternary based germicides which state their water hardness tolerance levels on the product label. The *higher* the water hardness tolerance level, the *greater the area* in which the germicide will be *safe*—beyond question, beyond the risk of public health. Onyx is glad to encourage all efforts toward this end, and as its contribution, offers germicide manufacturers quaternaries with the *highest hard water tolerance* and with *accepted* label claims.

Because water hardness is at best a variable, from well to well and from season to season, a safe germicide or sanitizer should offer the highest level of water hardness tolerance. Products based on Onyx' BTC-824, for example, are effective germicides in waters up to at least 500 ppm. Products based on other Onyx' quaternaries are effective in waters up to 1,100 ppm. All Onyx quaternaries are tested in accordance with Interpretation No. 21, Federal Register, September 1956. These claims have been reviewed and accepted by the U.S. Department of Agriculture.

*For further information on labeling procedures and on Onyx quaternaries, write for Bulletin HW-6-7. ONYX OIL & CHEMICAL COMPANY, Industrial Division, 190 Warren Street, Jersey City 2, N. J.

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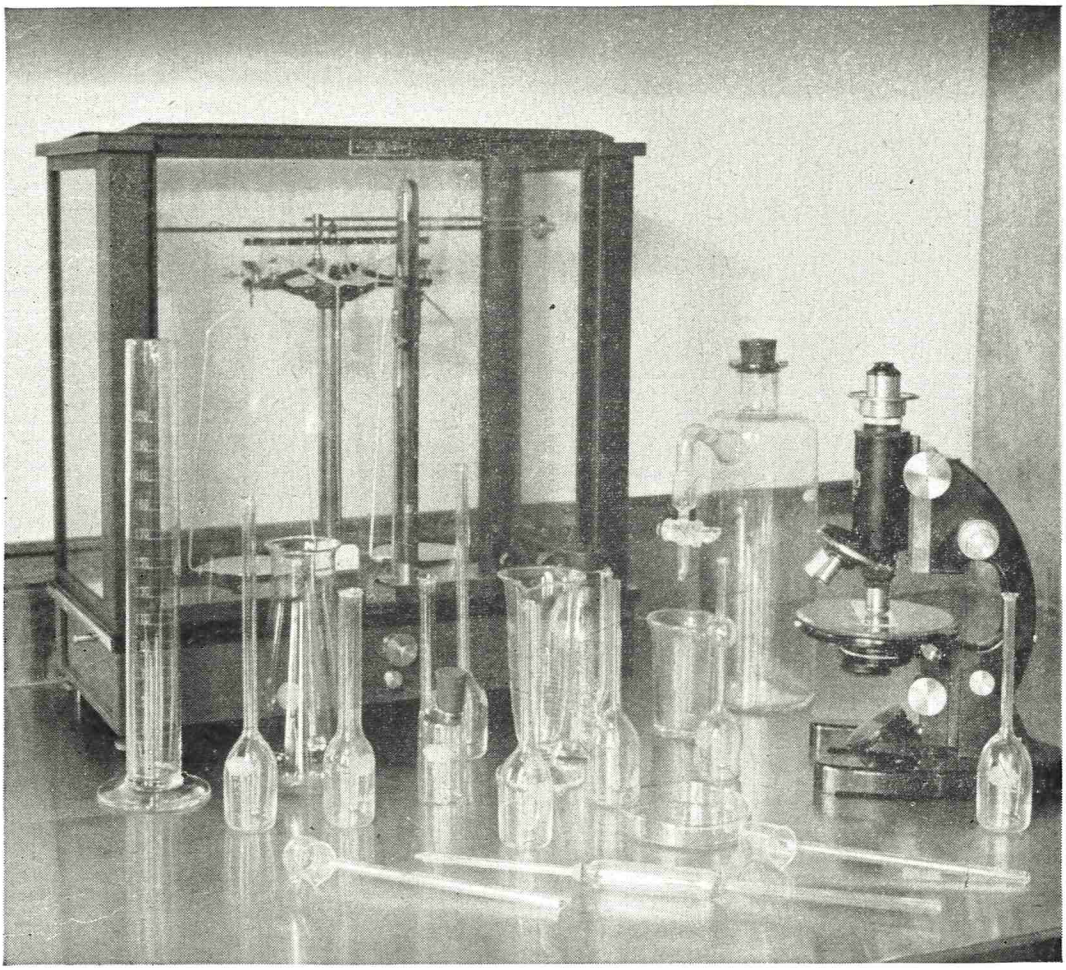

Everything but the scientist . . .

The surest way to get whatever you need in durable, precision-made glassware is to contact your local Cherry-Burrell Representative. He's in a position to deliver—and promptly—the laboratory supply items you require.

Why not give him a call? And, while you have him on the phone, keep in mind that you save when you buy in carton quantities . . . or maintain a standing order to fill your routine replacement needs.

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ITS YOUTH, ADOLESCENCE, AND MATURITY

JAMES HOUSTON SHRADER

Waterville, Vermont

Forty-five years ago this month, October 25-26, 1912, thirty-five men from Australia, Canada, and the United States met in Milwaukee to organize the International Association of Dairy and Milk Inspectors. They were motivated by the high resolve to improve the quality of the milk supply and place it in the hands of men competent to engage in such responsible work. In the President's opening address, he said that he had known carpenters, locksmiths, ward politicians, plumbers, and a cobbler to be appointed as dairy inspectors. He urged instruction and cooperation with the dairymen as being more effective than coercion.

PRESIDENTS

These founders came together as a result of the vision and industry of Charles J. Steffen, Chief Dairy Inspector of the City of Milwaukee. He personally visited the milk inspection divisions in Chicago, St. Paul, Minneapolis, St. Joseph, Kansas City, St. Louis, Omaha, Wichita, Cincinnati, Columbus, Cleveland, Toledo, and Detroit – some itinerary and industry. He was promised cooperation and support. Others rallied from Washington, D. C., Boston, Springfield, Richmond, Va., Seattle, Madison, Champaign, and other progressive municipalities – men of vision, industry, and competence. After an absence from contacts with the Association for twenty-four years, Steffen addressed the 24th Annual Meeting when it met again in Milwaukee in 1935.

An article on our presidents is presented in this Anniversary Issue of the Journal by Dr. Johns.[1] From 1926 I have been personally acquainted with them all and found them to be a fine group of fellows, devoted to the public interest and the work of the Association. A list of them through 1944-45 is reported in the Journal (J. Milk and Food Technol., 8:302. 1945). Presidents since then have been:

R. R. Palmer, Detroit, Mich.	1945-1946
R. G. Ross, Tulsa, Okla.	1946-1947
W. D. Tiedeman, Albany, N. Y.	1947-1948
A. W. Fuchs, Washington, D. C.	1948-1949
M. R. Fisher, St. Louis, Mo.	1949-1950
K. G. Weckel, Madison, Wis.	1950-1951
H. L. Thomasson, Shelbyville, Ind.	1951-1952

[1] Formerly Editor of the *Journal of Milk and Food Technology*.

CHARLES J. STEFFEN

H. J. Barnum, Denver, Col.	1952-1953
J. D. Faulkner, Washington, D. C.	1953-1954
I. E. Parkin, State College, Pa.	1954-1955
H. S. Adams, Indianapolis, Ind.	1955-1956
Paul Corash, New York, N. Y.	1956-1957

The Association has met in the following cities:

1912 Milwaukee	1935 Milwaukee
1913 Chicago	1936 Atlantic City
1914 Chicago	1937 Louisville
1915 Washington	1938 Cleveland
1917 Washington	1939 Jacksonville
1918 Chicago	1940 New York
1919 New York	1941 Tulsa, Okla.
1920 Chicago	1942 St. Louis
1921 New York	1943 Cancelled
1922 St. Paul	1944 Chicago
1923 Washington, D. C.	1945 Cancelled
1924 Detroit	1946 Atlantic City
1925 Indianapolis	1947 Milwaukee
1926 Philadelphia	1948 Philadelphia
1927 Toronto	1949 Columbus
1928 Chicago	1950 Atlantic City
1929 Memphis	1951 Glenwood Springs, Colo.
1930 Cleveland	1952 Milwaukee
1931 Montreal	1953 East Lansing
1932 Detroit	1954 Atlantic City
1933 Indianapolis	1955 Augusta, Ga.
1934 Boston	1956 Seattle, Wash.

CHANGES IN EMPHASIS OF SUBJECTS DISCUSSED

A review of the subjects which have been presented as papers at the annual meetings reveals the inter-

ests that have received emphasis over the years:

SUSTAINED INTEREST

Bacteriology (heavy)
Public relations (weak)
Dairy farm inspection and milk production (steady)
Sanitary plant equipment and operations (steady)
Animal diseases
Human disease in relation to milk

DECREASED INTEREST

Reports on milk quality of the supply for various areas
Administration
Legal aspects
Food value of milk
Ice cream
Pasteurization
Education
Non-fluid dairy products

NEW AND INCREASED INTEREST

Restaurant sanitation
General foods
Professional status
Equipment standards and technology
Interstate cream control
Detergency and sanitization

SECRETARIES

The first secretary was Ivan C. Weld, who held office until his death in 1929. His personal charm, his wide experience and competence in milk quality production and supervision, his excellent civic connections (twice president of the Washington, D. C. Chamber of Commerce) made him uniquely qualified to serve as the guiding star of our organization. For example, he formulated the first score cards used for milk contests by the Dairy Division, U. S. Department of Agriculture where he was employed at the time. On entering industrial employment in a most modern dairy plant, he developed a model and practical system of country milk production and laboratory control—way back there in 1910. His studies on the relative nutritive values of pasteurized vs. unpasteurized milk became

PROGRAM

FRIDAY, OCTOBER 25, 1912

10.30 A. M.

Address of Welcome, and President's Annual Address
MR. C. J. STEFFEN
Chief Inspector, Milwauke

Response to Address of Welcome, and Paper, "Methods Employed and Results Obtained in Improving the Milk Supply of Seattle."
Vice-President G. M. HENDERSON
Chief Inspector, Seattle

Paper, "Methods Employed and Results Obtained in Improving the Milk Supply of Springfield, Mass."
MR. J. A. GAMBLE
Inspector, Springfield

2.30 P. M.

Paper, "Methods Employed and Results Obtained in Improving the Milk Supply of Omaha."
MR. CLAUDE F. BOSSIE
Chief Inspector, Omaha

Paper, "Methods Employed and Results Obtained by the State Department of Agriculture in Improving the Milk Supply of Virginia."
MR. PEYTON ROWE
State Dairy Inspector, Richmond

Paper, "Methods Employed and Results Obtained in Improving the Milk Supply of Topeka."
DR. GEORGE F. BABB
Dairy and Milk Inspector, Topeka

Paper, "Methods Employed and Results Obtained in Improving the Milk Supply of Boston."
DR. JAS. O. JORDAN
Inspector of Milk, Boston

8 P. M.

Paper, "Methods Employed and Results Obtained in Improving the Milk Supply of Detroit."
Vice-President WILLIAM H. PRICE
Chief Dairy Inspector, Detroit

Paper, "Bacteriological and Chemical Work as Factors in the Control of Municipal Milk Supplies."
PROF. E. G. HASTINGS
University of Wisconsin, Madison

Paper, "Dairy Farm Inspection as a Factor in the Control of Municipal Milk Supplies."
DR. WM. C. WOODWARD
Health Officer, Washington, D. C.

SATURDAY, OCTOBER 26

10.30 A. M.

Paper, "Methods Employed and Results Obtained in Improving the Milk Supply of Washington, D. C."
DR. HULBERT YOUNG
Chief Dairy Inspector, Washington, D. C.

Paper, "Bovine Tuberculosis; Its Control or Eradication."
PROF. E. G. HASTINGS
University of Wisconsin, Madison

Paper, "Economic Milk Production."
PROF. W. J. FRASER
University of Illinois, Champaign

2.30 P. M.

Paper, "Dairy Inspection from the Standpoint of the Milk Producer."
MR. B. H. RAWL
Chief of Dairy Division, U. S. Department of Agriculture, Washington, D. C.

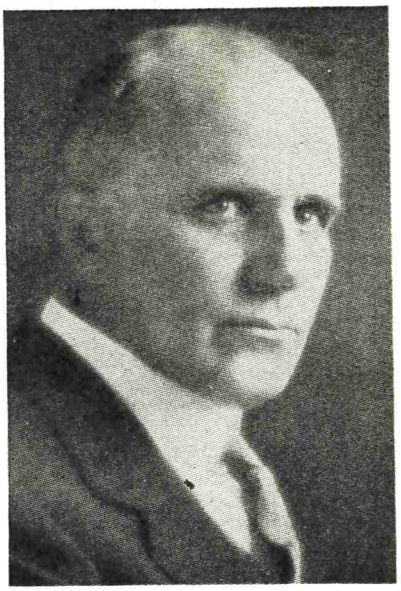
Paper, "Dairy Inspection from the Standpoint of the Milk Dealer."
MR. JOHN NICHOLS
President, International Milk Dealers Association, Cleveland

Paper, "Points to be Especially Safeguarded in the Production and Handling of Milk."
PROF. W. A. STOCKING
Cornell University, Ithaca

BUSINESS SESSION

A session for the transaction of business and the election of officers will be held on Saturday evening at 8 o'clock.

First Annual Meeting Program



IVAN C. WELD

classic: the published report ran through several editions and into hundreds of thousands of copies.

Ivan C. Weld possessed a personality that radiated warmth of good will and devotion to the work of the Association. His own self-less and indefatigable service was contagious. Our meetings exhibited the influence of his idealism and industry. He did not just *exhort* us to attend the meetings and assume responsities. He influenced us to *want* to do these. Although the membership was less than two hundred, Paul Brooks described these early meetings as follows: " . . . There was an evident and very apparent community of interest. Evening sessions were held and programs were, at times, too full for comfort. But members were in their seats on the dot . . . The enthusiasm was contagious and, of all the organization meetings which the writer had occasion to attend, these were the most interesting and inspiring. The 'king-pin' of the Association in those early days was Ivan C. Weld . . . He was a man of high character and ideals, whose 'practical experience with both men and methods, . . . tact and kindness, patience, thoroughness, and tenacity of purpose' made him outstanding."

"The Association is the child of his brain," said Ernest Kelly. He insisted that every person connected with the Association should stand for something, and that only official milk inspectors of the highest professional and personal qualifications be admitted to membership – hence the one class of earnest, devoted members. In his memorial service, Dr. William H. Price voiced the feelings of us all when he declared Weld to be "the soul of this organization . . . How we can get along without him we do not know; . . . we appreciated him while we had him. He will always be with us, and continue to influence us, with his infinite wisdom, and generosity, and love without end." I well remember our dismay, our feeling of helplessness, when we learned the sad news. What a man! His influence still leads us on.

Ivan C. Weld wrought so well that he left us an organization which had attracted another stalwart leader, Paul B. Brooks, M. D., Deputy Commissioner of Health of the State of New York. He was elected Secretary-Treasurer in 1929, after Ralph E. Irwin tided us over in the interim immediately after Weld's death.

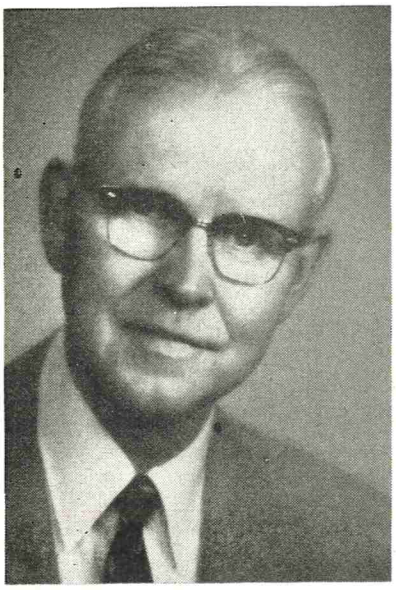
Dr. Brooks brought to the Association a professional standing, an executive ability, and a devotion to the work and aims of the society that kept him in this office until he requested release in 1936. He did great work on the epidemiology of milk-borne septic sore throat, and showed its relation to scarlet fever.

Then Sidney Leete took over the secretary-treasurership in 1936. His incumbency was marked by conscientious devotion to the needs and interests of the Association – all performed in addition to his regular employment (as was the case of each of the others).

PAUL B. BROOKS

He was particularly helpful in the early days of getting the Journal established. The attendant spectacular growth of the Association brought such a great increase to the duties of the Secretary that he felt unable to continue. He declined re-election in 1946 after ten years of self-less service. He was elected First Vice-President in 1949 but died before assuming incumbency as the probable President. In his final message to the Association, he urged the need for a full-time incumbent with adequate financial and clerical assistance.

In 1947 I served as Secretary-Treasurer until the new permanent Secretary, George A. West, was elect-



GEORGE A. WEST

ed in 1948. He served only until 1951 when our present Secretary-Treasurer, H. H. Wilkowske, and our full-time Executive Secretary, H. L. Thomasson, took over. We had learned the lesson of growth: two men now do what heretofore had been faithfully done as well as possible by one man in his "spare time". We owe a great debt of gratitude to these early un-sung heroes.

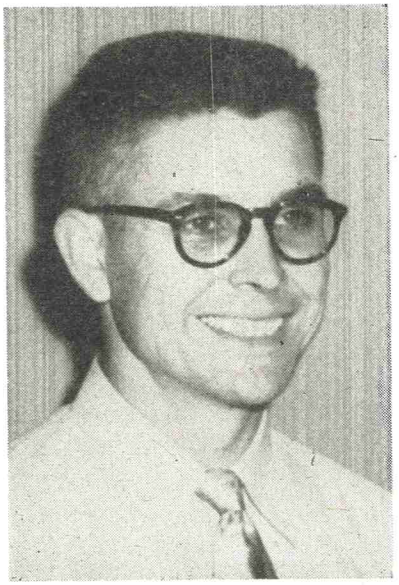
The particular value to the Association of the employment of a full-time executive secretary was threefold:

1. It made possible the maintenance of advances in organizational functioning that had been achieved and assured their continued development — since we had learned that unless someone lived with these new projects and cultivated them, they would be lost through inattention and fall by default.

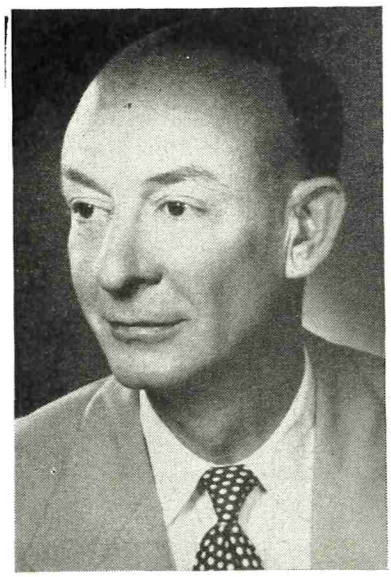
2. It strengthened our resources by consolidating all financial and operational activities under one administrative head, with attendant economies and increased efficiency.

3. It provided means for maintaining contacts with our increasing organizational work all over the country and at the same time provided an agency for creating new interests where none now existed.

In our case we were fortunate in finding an incumbent who was not only an efficient secretary and business man but a sanitarian in his own right — a unique combination.



H. H. WILKOWSKE



H. L. THOMASSON

MEMBERSHIP

The Association started off with only one class of members, namely, those engaged officially in milk inspection. At the Montreal meeting in 1931, the then Secretary, Dr. Brooks, pointed out that since only about 55 percent of the members of the Association were actually then inspectors, he urged that the name of the organization be changed to one more descriptive of the character of the membership and also possibly more professional in tone. At the Atlantic City meeting in 1936, the word "Inspectors" was changed in the title to "Sanitarians," so that the new name was "The International Association of Milk Sanitarians." Then in 1947 at the Milwaukee meeting, the word "Food" was added. We then incorporated under the laws of the State of New Jersey as *The International Association of Milk and Food Sanitarians, Inc.*

The professional status of the membership received

early attention. At the Philadelphia meeting in 1926, a resolution was sent to all state and local health departments calling on them to employ "only such persons to fill the positions of dairy and milk inspectors as are competent and well qualified to secure the desired results."

At the Detroit meeting in 1932, the Constitution was amended to admit associate members but without the privilege of holding office or of voting. At the Cleveland meeting in 1938, the Constitution was again revised to reduce dues from the original $5 rate to $3 for active members and $2 for associate members. Starting at the Columbus meeting in 1949 and developing until the East Lansing meeting in 1953, the Constitution was practically re-written to modernize it, to define clearly its objectives and the duties of the officers, to remove restrictions which had precluded industrial sanitarians from full membership status equal to that of officially employed members, and to inaugurate the Affiliate status of allied organizations.

Over the years, there had been a decided expression of inspector class-consciousness. In the beginnings of the Association, this expressed itself by restricting membership to only officially employed inspectors, as shown above. Increasing liberalization became evident as the trail-blazing pioneers in offical regulatory work died off and/or matured into cooperative recognition that others, outside of officialdom, were likewise responsible, professionally-minded persons. So collaboration between officials and those in industrial work increased. Much of this altered outlook came from the work of the committees which we shall discuss later.

Then, too, there seemed to be a growing tendency around the country to restrict the higher administrative posts in health departments to physicians and engineers. In addition, salary scales and employment opportunities reflected this discrimination. Many fiery words — and some study — have been directed to strengthening the professional status of milk and food sanitarians.

The following listing depicts the growth of membership over the years. It is foreshortened to economize space:

Membership

Year	Active	Associate and Affiliate	Total	
1912	35		35	
1920	97		97	
1931	271		271	
1933	188	13	201	
1936	163	61[a]	227	
1938	196	132	328	
1939	233	167	400	
1940	285	622	907	
1941	318	828	1146	(43 states; 7
1942	302	921	1253	foreign coun-
1944	337	1328	1665	tries)
1946	450	1624	2074	
1947	429	1612	2041	(apparent de-
1948	420	1787	2207	crease by re-
1949			2437	organ-
1952	493	2451	3244	ization of
1953			3542	member-
1954			3800	ship roll)
1956			4200	

[a] plus 3 honorary members

The above listing of growth in membership brings out three significant features:

1. The period from 1911-1939 showed slow growth, culminating in a total membership which held a plateau at about 300 or so, confined overwhelmingly to to Eastern States north of the Potomac and Ohio rivers and west to Chicago.

2. At about 1939, a sudden rise in the membership indicated some noteworthy event that greatly stimulated interest, represented in almost all the States and several foreign countries.

3. At about 1947, another clear rise in membership occurred, apparently related to the de-restrictions on industrialists and affiliations.

In the year 1937, the *Journal of Milk Technology* was founded, and in 1947 the new Constitution opened a new era in widening the vision and field of the Association by facilitating the cooperation of state affiliations and industrial sanitarians and engineers. It is noticeable that the breaks in the rise of membership occur at these two points, indicating the influence of these developments on membership.

We recognize that size of membership is not the only criterion of strength. The financial picture also is important. We recall that the balance in the treasury at the end of the 1912 meeting was $1.74; that, in 1956, was about $13,000.

Journal of Milk and Food Technology

Ever since the Association started in 1911, the papers that were presented at the Annual Meetings were reprinted in Reports. These ran to about 200 pages or so each. They included the list of members, the Constitution, the committees, and the report of the proceedings of the last previous annual meetings. These were sold at $5 each — the same as the dues of the members.

At the Montreal meeting in 1931, William (Bill) B. Palmer urged that we start the publication of a journal to replace the Report series. This idea was based on the belief that a journal would go to the membership often throughout the year, would "give service" to the members who had not been able to attend the annual meeting, would carry more papers than only those presented at the annual meetings, and would engender a great growth in interest over the whole country — with attendant increase in membership. The idea was referred to a "Special Committee on

Journal Publication" under the chairmanship of W. B. Palmer, the other members being C. S. Leete, J. A. Tobey, J. J. Regan, and J. H. Shrader.

After several years of trying to "sell" the Association on the idea, we finally took the initiative and went ahead on our own. Palmer personally supervised the publication of a journal that we thought would appeal to the membership. He took a batch of them to the Louisville meeting at the 1937 annual convention held under the presidency of J. G. Hardenbergh (who had strongly encouraged the whole project). The Association thought well enough of the idea to authorize its adoption, although with much hesitation and fear that the Association would be loaded down with a burdensome expense.

The annual message of President Tolland in January, 1938, announced that the old Report series which had been issued for the past twenty-five years would be replaced by the new bi-monthly Journal. The Executive Board appointed Bill Palmer as Managing Editor, and J. H. Shrader, the Editor, together with a Board of Associate Editors of which two members are still active, namely, C. A. Abele and C. K. Johns. Bill Palmer handled all the business end; I handled all the papers and literary aspects. Our circulation was our membership which consisted of about 350. At the 1938 Cleveland meeting, Secretary Leete reported that the Journal was operating "in the black" – an "outstanding example of excellent management and Journal appeal, as most first year publications must be subsidized."

A noteworthy event soon followed. At the Cleveland meeting in 1938 the secretary of the newly formed Central States Inspectors Association informed me that his group wanted to publish a journal but realizing the expense involved, wondered whether something could be worked out whereby they could get some benefit from our Journal. This led to the idea that we solicit the various state organizations of milk inspectors to designate the Journal as their respective official organ.

As soon as the New York State Milk Inspectors Association heard of this development (which they did very soon), they were prompt to request this service – the first "on the band wagon" as one of the western groups expressed it. They and the Massachusetts groups actually secured this status before the Central States group could act. The Connecticut association quickly came in. So by the time of the 1939 annual meeting, there were four so associated, with applications from five more pending.

All these developments stimulated our own Association to a more active life. The Constitution was amended: (a) to reduce membership dues to $3 and $2 for full and associate membership, respectively; (b) to study ways to standardize equipment; and (c) to study the granting of awards for student training, meriterious work of sanitarians, and affiliations of other organizations – all this in 1940.

The Journal continued to develop. In 1947, the title was expanded to include the word "Food," making the new title read *Journal of Milk and Food Technology.* It happened that the Institute of Food Technologists started their journal *Food Technology* and the California Association their *Sanitarian,* all in the same year that we started ours – none of us knowing what the others were plannin gto do. We used the word "technology" because it indicated a broader coverage than the word "sanitation," thus enabling us to appeal to more contributiors of informative papers and more valuable to our advertisers. This has richly paid off in the work of the 3-A standards project, to be discussed later.

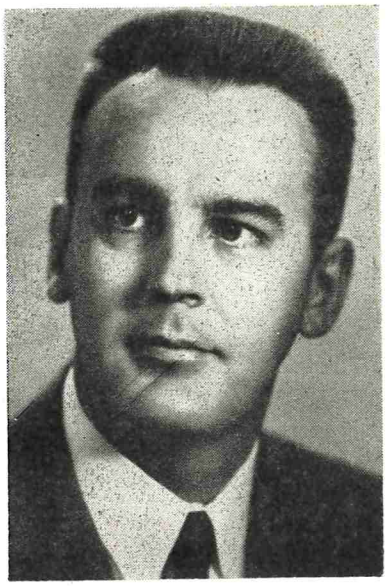
We included the word "food" in the Journal because many milk sanitarians were engaged in general food control, as for example in the frozen foods industry, meat packing, packaging, and others. We needed a broad base of subject matter to enlist a wide support of members, subscribers, and advertisers. The present name was authorized by the Executive Board in 1947. In these days when the Journal is well established, it may be difficult for the membership to realize how we struggled in those early days to make the Journal pay its way – in fact, to be a contributory asset to the growth of the Association.

Pursuant to the importunities of advertisers that we enlarge the size of the Journal to facilitate the reuse of their same plates among other journals in which they advertised, we enlarged the Journal to its present standardized dimension in 1952. In 1954 it was made a monthly publication.

The growth in the circulation of the Journal is indicated below:

CIRCULATION OF JOURNAL

Year	Copies Printed	Copies Mailed	
1938 (March)	about 350	328	
1938 (Nov.)	1500		
1939 (Jan.)	1750	1395	
1940		1832	
1941		2300	
1946		3000	(including 17
1948	4300	4000	foreign coun-
1949	4300	4101	tries)
1950	4500	4200	
1952	4500		
1954		4800	(monthly, in-
1956		5600	cluding 400 foreign subscribers)



J. C. OLSON, JR.

In May, 1951, Bill Palmer passed away. He literally wore himself out in our service. With no assistance or remuneration of any kind, he carried on, singlehanded, the duties of Managing Editor, after his return home from his duties of milk inspection and running his official laboratory. Many were the times when discouragement came but never were both of us afflicted this way at the same time. One of us was always able to help the other on the rebound. Under declining health, Bill fought on. He died suddenly of a heart attack. During all these years, the Executive Committee gave us every support. Never once did they interfere with our handling of Journal affairs nor obstructively dictate in any way.

The job of Managing Editor was taken over by our present Executive Secretary, Mr. H. L. Thomasson, in 1951. He reorganized the business end of the Journal enterprise and put it on a sound, financially profitable basis.

In 1954, Editor Shrader concluded that the time had come for a younger man to take over. He was succeeded by Dr. J. C. Olson, Jr. who had served well on the Board of Associate Editors.

Affiliates

It is clear from the above that one of the great developments which evolved from publication of the Journal was the inauguration of the policy of establishing cooperative relations with other organizations. This move came from the Central States Milk Inspectors Association. That organization did not continue to function long under its original setup but it started a constructive move that swept over the country and is still growing, namely, affiliation.

This collaboration at first took the form of the local association designating the Journal as its official organ. This worked so well that when the Constitution was re-written in 1947, provision was made for recognizing affiliation as an official form of collaboration, with the Advisory Council serving as organic liasion between the parent body and the local groups. The growth of this feature is shown below.

Affiliates

Year	Number designating Journal as official organ	Number officially affiliated with the Association
1938	4	—
1939	13	—
1940	14	—
1945	12	6
1946	13	7
1947	12	9
1948	12	10
1949	8	12
1950	8	12
1951	10	12
1952	—	19
1953	—	25
1954	—	27
1955	—	28
1956	—	28

This move has paid off in three salient ways: (a) it raised the sights of the original membership of the Association from an Eastern viewpoint to one of a nationwide dimension, and also raised the outlook of the local groups all over the country to their place in the larger order of things; (b) it broadened the base of Association work so that the work of the Committees and the development of the Journal could grow apace, and (c) it greatly increased the circulation (and strength) of the Journal and the Association as a whole.

3-A Standards

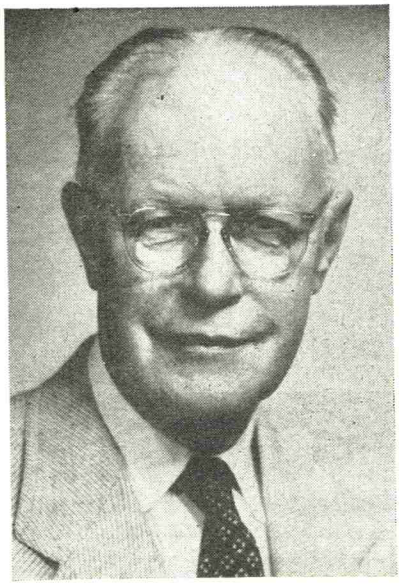
Back in 1933, W. D. Tiedeman as Chairman of the Committee on Sanitary Precedure recommended that the Committee be authorized to collaborate with a committee of the International Association of Milk Dealers who already were working with the manufacturers of dairy equipment. The work was started in 1934. In 1938, the two committees of Milk Plant Equipment and Sanitary Procedure were merged into the present one, namely, Sanitary Procedure. The collaboration of committees of milk dealers, the manufacturers of equipment, and this Association adopted the symbol "3-A" for use on equipment that complied with the standards of the collaborating committees. This symbol could not be registered by us because of the ownership of the mark "A" by the De-

Laval Separator Co., but when this firm learned of our need of it, they generously released all rights to us. The figure "3" stands for the three associations that

WALTER D. TIEDEMAN

constitute the standards committee. These now are the U. S. Public Health Service, the Dairy Industries Supply Association, and our Association. In 1944 these three groups worked out the details for the 3-A symbol quality control program for equipment manufacture. In 1941 Tiedeman was succeeded by Abele as Chairman of our Association committee.

The success of this work in producing equipment that were sanitary and mechanically practicable led to the demand that a procedure be established for



C. A. ABELE

authorizing firms, whose equipment complied with the standards, to use the 3-A symbol stamped on each piece. By 1956, there were 18 authorized users of the symbol and 89 requests therefor. C. A. Abele is secretary of the 3-A Symbol Council.

Other groups in the non-milk field have now undertaken similar work, notably the Baking Industry Sanitary Standards group, the National Sanitation Foundation, and others.

Another noteworthy development resulting from this work has been the recognition given this Association by outside groups. The Dairy Industries Supply Association designated a day of the 1956 Exposition as "3-A Standards Day," with our President Paul Corash as chief speaker. All health organizations have been contacted and informed that these sanitary standards are available. The U. S. Standard Milk Ordiance and Code specify these approved 3-A designs, and many other official agencies now do likewise. Here is professional recognition of this Association in the soundest way possible. It did not come by our vociferous declarations as to how good we were, it came spontaneously and unsolicited from the professional engineers, the manufacturers, and the public health officials, showing that they considered that we were technically competent.

Another important development out of this colloboration is the contact which this gives us to the newest developments in the technology of industrial development in general, and of milk plant equipment in particular, as for example, new techniques developed by other industries and their application to the dairy industry.

REFLECTIONS IN PERSPECTIVE

From small beginnings, the Association has developed along lines characterized by three well-marked periods:

1. The long period of slow growth from 1911 — 1938 when the pioneer work was laying a foundation of knowledge, of trained and responsible personnel, and of stable organization.
2. A middle period of 1938 — 1952 when the Journal was being developed, together with concomitant beginnings of the 3-A standards collaboration.
3. The present period from 1952 when we secured the full-time services of our efficient Executive Secretary.

These periods are well marked in the membership increase, each designated by a decided break in the slope of the curve.

Over the years, there have been several notable achievements of the Association.

It created an organization that powerfully influenced

the development of sanitary milk production. In the early days of milk inspection, it afforded a great stimulus to our hard-pressed pioneers who here found understanding sympathy, support, new knowledge, and awarm cordiality. This enlisted the kind of loyalty and interest that comes from shared experiences in victory and defeat. Once a year it provided a rallying point for all of us who thoughout the year battled with the kinds of problems which only those in pioneer milk control work can understand.

2. It has inaugurated and developed a growing Journal that fosters integration of all parts of the food sanitation field; that disseminates knowledge of public health, engineering, and scientific value worldwide; that provides a medium for publication of new knowledge in this field; and that stimulates research.

3. It has developed a procedure for administering a symbol for use by manufacturers who produce equipment that meets rigid requirements of mechanical and sanitary quality, and powerfully influences the production of equipment in the whole food manufacturing industry.

4. It has engaged in bringing into unified consciousness the thinking and local interests of milk and food sanitarians all over the country and several foreign nations, thereby increasing our resources, reinforcing our knowledge, and doing a constructive educational job that fosters solidarity of professional interest.

5. It is exerting a powerful integrating and creative force in doing for the milk and food sanitation work of the country, what the organization of the federal union did for the scattered colonies along the Atlantic coast in 1776. It is making us nationally-minded where we all think in terms of the whole as well as the parts, and also where we can foster and stimulate development in areas that heretofore have not been able to see the light of modern milk and food sanitation.

Peace hath her victories no less than war. The rise and development of the International Association of Milk and Food Sanitarians attests to the substanti ality of our conquests in the field of sanitary milk and food production. By losing our lives in the service of others, we are finding the fullest kind of life. Perseverence in such an undertaking insures inevitable and continuing success.

ANNUAL MEETINGS — THEN AND NOW

HAROLD S. ADAMS[1]

Department of Public Health, Indiana University

School of Medicine, Indianapolis

One of the important factors contributing to the growth and vigor of the International Association of Milk and Food Sanitarians has been the annual meetings. If we could but turn back the pages of history and look in once again on the first annual meeting, it would be an inspiration and an unforgetable experience. Over the years International has grown, built by dedicated men. In those days they were few among many. No doubt they were looked upon as "cranks and do gooders", who were agitating for improvements, which in the minds of many were uncalled for, unneeded. This small group, said milk and milk products must be safe and wholesome. They fought for better methods, they advocated better control. They decried politics in the regulation of this important food. At first, and quite from necessity they worked alone. A milk inspector in Seattle had embarked upon a particular system. He wondered how they were doing it in Boston. Milwaukee was moving forward in milk inspection and so was Topeka and Washington, D. C. I am sure there must have been an almost constant running correspondence between the milk inspectors of these several cities where milk programs were beginning to take shape. Things were brewing in the control of milk and it was in this early climate of milk sanitation that International was born and with it the annual meeting.

The minutes and proceedings of annual meetings of this Association have been carefully documented. Milwaukee, Wisconsin was the site of the first one held, October 2 and 26, 1912. This was the first meeting of the International Association of Dairy and Milk Inspectors. C. J. Steffen, Chief Dairy Inspector of Milwaukee was President. Ivan C. Weld, of Washington, D. C. was Secretary-Treasurer, a position he held continuously until his passing in 1929. In the first annual report, which included papers read at the Milwaukee meeting, there also appeared a list of members, thirty-five in number. The finances of this infant association were quite precarious in those early days. Treasurer Weld's report showed a total income derived from membership dues of $70.00. Expenditures were $68.26 leaving a cash balance of $1.74.

The tone of the first meeting and the setting of the stage for the high ideals of International were well exemplified by President Steffen when he had this to say in his Presidential address:

> 'How to proceed to more completely safeguard the milk supply and to encourage the employment of competent, experienced men as inspectors, and to standardize and make uniform our work, are some of the objects for which this Association was organized, and for the accomplishment of which this Association will labor . . . . I trust the result of our work will be received by our superiors throughout this and other countries in the spirit and for the purpose for which this Association was organized, namely to elevate and to improve the work and to place it in the hands of men who are best qualified and fitted to do the work" (*1*).

In this brief historical sketch, it would seem rather fitting and proper to pause momentarily and consider some of the obstacles faced by these early pioneers. Perhaps one of the most awesome was the general apathy of the public. Few appreciated the potential danger to health of an impure and infected milk supply. Earlier studies had shown conclusively that disease organisms found a most fertile medium in milk, and that milk could and did all to frequently function as a vehicle for the spread of disease. These men meeting in Milwaukee knew this. Their problem was that of translating this information into action, of getting others in high places to accept and encourage their work. The health of the dairy cow had not yet received the attention it deserved. This concerned them too. They were aware that tuberculosis of bovine origin could be transmitted to man. One of the papers at this first meeting discussed this subject. Eventually testing cattle for tuberculosis was begun, but it took over twenty years to rid dairy herds in this country of this scourge. Pasteurization was in its infancy. In fact, it was in this very year that Dr. Charles North published his work on the time-temperature relationship for the destruction of pathogens in milk. When this gathering was held in Milwaukee, the control of raw milk was of real concern. Milk ordinances were not numerous and were to be found mainly in the larger cities. The technique of dairy inspection was a subject to consume attention at the first meeting and for many more to come. Doubtless it can be said that the first International meeting epitomized a trend which has been followed consistently by our Association ever since. It has represented a convention of

[1]Past-President International Association of Milk and Food Sanitarians, Inc.

Boston was the site of the 23rd Annual Meeting in October 1934. To many of the older members who view this picture can be seen several who later became president or were elected to important offices in International.

interests where men of like occupations might exchange points of view and go back to their home communities and apply them.

Space does not permit a review of all the annual meetings, but a casual examination of the "Proceedings", published before the Journal became a reality, indicates a gradual and continuous growth in membership. The tenth annual meeting was held in New York City, November 14, 15 and 16, 1921. From the original thirty-five, membership had now increased to about one hundred. So eager were these early members to get the most out of the annual meeting, that the program was tightly packed. In fact, some years later, Dr. Paul Brooks, a Past President, made these comments, "There is an evident and very apparent community of interest. Evening sessions were held, and programs were, at times, too full for comfort. But members were in their seats on the dot, stayed until the last gavel fell and discussion never languished" (2). By this date too, committees had been appointed and their reports were presented at the annual meeting. Subject matter coverage was likewise increasing and at the tenth annual meeting, some thirty-two separate papers were presented along with a number of committee reports. The number of papers given in 1921 was three times those given at the first meeting ten years earlier. Activity was increasing, progress was being made.

In 1936 a significant change took place for it was at this annual meeting that the name of the Association was changed. It then became the "International Association of Milk Sanitarians", and so remained until 1947 when words, "and Food", were added to give us the presently used Association name.

We pass on now to the thirty-sixth annual meeting, held just twenty years ago in Louisville, Kentucky, October 1937. This annual meeting has particular significance. It was a sort of banner year. At this meeting, just two decades ago, the Journal of Milk and Food Technology was launched. History tells us that William B. (Bill) Palmer, the first managing editor, got off the train in Louisville carrying a bundle under his arm. It contained Volume 1, Number 1 of the Journal. In the frontispiece there appeared this announcement, "This, the first issue of the Journal of Milk Technology, is published especially for the twenty-sixth annual meeting of the International Association of Milk Sanitarians at Louisville, Kentucky, October 11-13, 1937. The Journal is the official publication of the Association".

Sites of the annual meetings, have changed as the Association has grown in membership and affiliated associations have been formed. Atlantic City, New Jersey, has been the locale for at least three, held generally just before the National Dairy Exposition. The first meeting held west of the Mississippi was at

Glenwood Springs, Colorado in 1951. In 1955, the first southern area meeting was held at Augusta, Georgia. A long trek to the Pacific Northwest was made in 1956 when the annual meeting was at Seattle, Washington.

Looking back it is heartening to see the influence of the annual meetings. Those in attendance can always hear timely and informative technical papers. Outstanding specialists contribute generously to the advancement of knowledge in milk and food sanitation. All papers presented are published in the Journal. As a matter of fact, and attesting further to the worth of annual meetings, thousands of reprints of papers presented have been printed and circulated. Requests for these come from all parts of the world.

The annual meeting is, and continues to be, one of the highlights of the Association. Early meetings were, and present meetings continue to be, technical and scientific in nature, yet good fellowship always prevails. Milk and food sanitarians always find it profitable, stimulating and pleasant to be among those present.

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2. Shrader, J. H. The International Association of Milk and Food Sanitarians, Inc. Its Accomplishments and Aims. J. of Milk and Food Technol., 11: 3 May-June 1948.

Seattle was the site of the 43rd Annual Meeting. The growth of International is illustrated when one compares this with the picture taken at Boston, twenty years earlier. Now too the annual meeting banquet is graced by the presence of the ladies.

THE ASSOCIATION AWARDS

JOHN D. FAULKNER[1]

Division of Sanitary Engineering Services,
U. S. Public Helath Service, Department of Health, Education,
and Welfare, Washington, D. C.

Three awards are presented annually by the International Association of Milk and Food Sanitarians, Inc., — *The Citation Award, The Sanitarians Award,* and *The Scholarship Award.*

The awards program of the Association had its origin in an action taken at the 1939 Annual Meeting when the Executive Board was authorized to establish an award in recognition of outstanding service performed in the field of milk sanitation or milk technology. It was specified that the award should consist of an engrossed medal or a certificate publicly presented, and accompanied by such monetary honorarium as may be contributed by a public-spirited person, organization, or business, subject to the approval of the Executive Board (*1*).

No action was taken on this matter during World War II and the years immediately following; however, in 1951 the Executive Board undertook a study of ways and means of bestowing recognition for outstanding service to the International Association of Milk and Food Sanitarians, Inc., and for especial individual achievement in the field of milk and food sanitation. Following this study it was decided to create two annual awards for distinguished service. A scholarship award for students majoring in public health and sanitary science has since been established.

THE CITATION AWARD

This award was created for the purpose of bestowing recognition upon members of the Association who, through long and distinguished service, have contributed greatly to the professional advancement, growth and reputation of the International Association of Milk and Food Sanitarians, Inc. *The Citation Award* is presented each year at the Annual Meeting to the nominee or nominees for the particular year whose past services and contributions have been judged to be the most outstanding.

The first presentations of *The Citation Award* were made at the 1951 Annual Meeting to Dr. James Houston Shrader of Wollaston, Massachusetts, and, posthumously, to William B. Palmer of Orange, New Jersey. In 1952 the Award was presented to Charles A. Abele of Chicago, Illinois; in 1953 to Clarence W. Weber of Albany, New York; in 1954 to Dr. C. K. Johns of Ottawa, Canada; in 1955 to Dr. R. H. Ross of Tulsa, Oklahoma, and Abraham W. Fuchs of Washington, D. C.; and in 1956 to Dr. Kenneth G. Weckel of Madison, Wisconsin.

Any member, or Affiliate Association, may nominate an individual for *The Citation Award.* Nominations, however, must be accompanied by a supporting statement listing the individual's past contributions and services. Selection of the recipient is the responsibility of the Committee on Recognition and Awards.

THE SANITARIANS AWARD

The second of the two distinguished service awards, *The Sanitarians Award,* was created as a means of bringing long overdue honor and recognition to local sanitarians who, by reason of ability and endeavor, have made real contributions to ultimate human welfare. It consists of a certificate of citation and $1,000 in cash, and is conferred annually upon a local sanitarian from the United States or Canada who, within the preceding five years, has made meritorious and outstanding contributions in the field of milk or food sanitation (or both) to the public health and welfare of his community. It is one of the most important honors that can be conferred upon a professional public health worker.

The first presentation of this Award was made at the 1952 Annual Meeting to Paul Corash, Chief of the Division of Milk Control, New York City Health Department. Dr. E. F. Meyers of the Milk, Meat, and Food Division, City Health Department, Grand Rapids, Michigan, received the 1953 Award; Kelly G. Vester, Senior Sanitarian of the City Health Department, Rocky Mount, North Carolina, the 1954 Award; B. G. Tennant, Chief Sanitarian of the Escambia County Health Department, Pensacola, Florida, the 1955 Award; and John H. Fritz, Chief of the Milk and Food Section of the City Health Department, Kansas City, Missouri, the 1956 Award.

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[1]Past President, International Association of Milk and Food Sanitarians, Inc.

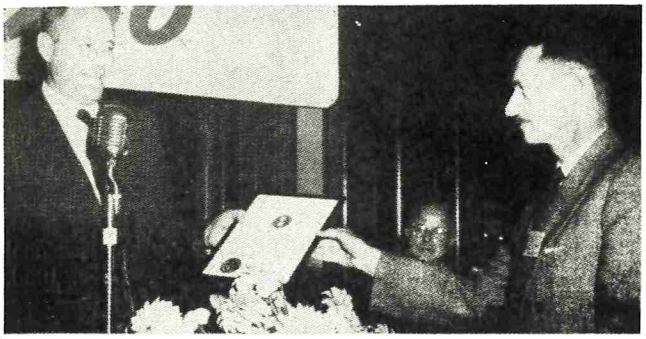
Presentation of the 1952 Sanitarians Award to Paul Corash by K. G. Weckel.

The Sanitarians Award is sponsored jointly by five manufacturers of sanitation chemicals, the Diversey Corporation, Klenzade Products, Inc., Oakite Products, Inc., Olin Mathieson Chemical Corporation, and the Pennsylvania Salt Manufacturing Company. The rules governing the eligibility of candidates and method of nomination are published each year in the Journal of Milk and Food Technology (*2*). The Award is administered by the Association through the Committee on Recognition and Awards, and neither the Executive Board nor the sponsoring firms has any voice in the selection of the recipients.

THE SCHOLARSHIP AWARD PROGRAM

In 1955 the Committee on Education and Professional Development undertook a study of a proposal for the creation of student scholarships as a joint and cooperative financial undertaking of the International Association of Milk and Food Sanitarians, Inc., and the Affiliate Associations. Upon completion of this study, the Committee recommended that the Executive Board be authorized to appropriate from the treasury an amount not to exceed three hundred and fifty dollars annually to establish the first of several scholarships for third-year undergraduate students majoring in sanitary science and public health. The Committee further recommended that the Affiliate Associations voluntarily contribute additional moneys to the scholarship fund annually, in such amounts as they desire, to be used for additional scholarships as funds received permit.

The recommendations of the Committee were accepted at the 1955 Annual Meeting, and a scholarship in the amount of three hundred dollars was established by the Executive Board, Thaddeus E. Midu-



Dr. C. K. Johns receives 1954 Citation Award from Harold Barnum.

ra, a student at the University of Massachusetts, was selected as the first recipient. It is anticipated undergraduate scholarships will be created within the next few years.

The scholarship program is administered by the Committee on Education and Professional Development, and the procedures followed are published in the Journal of Milk and Food Technology (3).

NEED FOR OTHER AWARDS

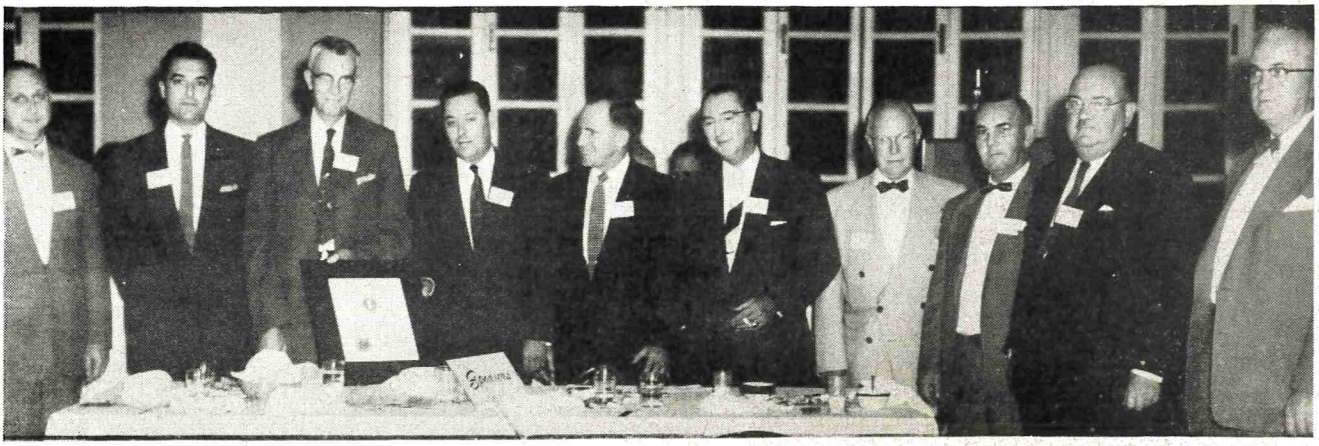
The effects of a suitable awards program is unquestionably beneficial. It is not only a means of bringing honor and recognition to individuals and groups for their accomplishments, but serves as well to stimulate increased professional and public interest, and to attract young people of ability to a specific vocation. The profession of Milk and Food Sanitarian has not in past years been properly recognized and encouraged in this manner. The Association's awards

Citation Award Recipients

1951—Dr. James H. Shrader
—Mr. William B. Palmer
1952—Mr. Charles A. Abele
1953—Mr. Clarence W. Weber
1954—Dr. C. K. Johns
1955—Dr. R. G. Ross
—Mr. Abraham W. Fuchs
1956—Dr. Kenneth G. Weckel

Sanitarians Award Recipients

1952—Mr. Paul Corash
1953—Dr. E. F. Meyers
1954—Mr. Kelly G. Vester
1955—Mr. B. G. Tennant
1956—Mr. John H. Fritz



"SANITARIAN OF THE YEAR" AND SPONSORS OF THE AWARD

Standing with representatives of the five national concerns which sponsor the Sanitarian's Award is B. G. Tennant, recipient of the 1955 honor, at the annual banquet of International Association of Milk and Food Sanitarians, October 5, in Augusta, Ga. Chief Sanitarian of the Escambia County Health Department, Pensacola, Fla., Mr. Tennant received the award and a check for $1,000, for his meritorious contribution to the health and welfare of his community in milk and food sanitation in the past five years. Left to right above are John P. Greze, Oakite Products, Inc.; Larry Dormuth and William A. Hadfield, Pennsylvania Salt Manufacturing Company; Mr. Tennant; Mr. Finnegan and M. L. Duggan, of Olin Mathieson Chemical Corp.; C. A. Abele and A. K. Sanders, The Diversey Corporation; and C. B. Shogren and Wm. J. Dixon Klenzade Products, Inc.

program is an excellent step in this direction, however, it is national in scope. It would appear desirable for State public health and sanitation organizations to create similar types of awards. Suitable awards might also be established for recognition of achievement in milk and food sanitation research and for outstanding work performed by groups such as the staff of a local health department or the sanitation staff of a milk or food plant.

REFERENCES

1. International Association of Milk Sanitarians, 28 Annual Report, J. Milk Technol., 2: 318-319. 1939.

2. International Association of Milk and Food Sanitarians, Announcement Concerning the Sanitarians Award for 1957. J. Milk and Food Technol. 20: 1-2. 1957.

3. International Association of Milk and Food Sanitarians, Inc., Report of the Committee on Education and Professional Development. J. Milk and Food Technol., 19: 345-348. 1956.

QUESTIONS AND ANSWERS

Editorial Note: Various questions of technical nature may be submitted to the Editorial Office of the Journal. They will be referred to a Committee which has been formed to provide answers to such questions. A question in your mind may be in the minds of many others. Send your questions in and we shall attempt to answer them.

QUESTION: Frozen foods are not always kept in a frozen condition. Could interstate regulations require that a frozen chunk of dye be placed behind a filter paper window in the package so that the housewife could tell whether thawing had occurred?

HAROLD VAN COOPS, Casper, Wyoming

ANSWER: This problem is currently under study in governmental and industry research groups. Various indicators of thawing have been suggested.

As a recent one consists of a clay mixture containing an aromatic amine which is yellow when frozen but is green if the product thaws at any time or re-freezes. This is U. S. Patent No. 276211, Monsanto Chemical Company.

Another approach is to observe chemical changes in frozen foods which have thawed. For example, ascorbic acid levels in strawberries, or the ratio of chlorophyll to pheophytin in peas.

QUESTION: After stock phosphate buffer solution stands for a few days a white flocculent precipitate forms. Does this render the buffer undesirable for dilution blanks in making standard plate counts? What degree of accuracy is necessary in making up dilution water from this stock buffer?

J. L. COURTNEY, Oak Ridge, Tenn.

ANSWER; Opinion on the white precipitate is that it is probably due to impurities in the chemicals used, or to mineral contamination in the distilled water, or unclean glassware.

More detailed information may be obtained from: DR. L. A. BLACK, Taft Engineering Center, U.S.P.H.S. Cincinnati, Ohio, or J. C. McCaffrey, chairman, Applied Laboratory Methods Committee (of this Association) 1800 West Fillmore Street, Chicago 12, Ill.

QUESTION: What practical tests that can be made to determine if proper cleaning and sterilization methods are being used. Also please give me a list of books and phamplets on food sanitarion and proper food preparation and storage.

T. M. BRAMMER, Hillsville, Va.

ANSWER: "Water break test" – Rinse container and hold up to light. If surface is clean it is wetted entirely by water and no break or coalescence occurs. "Salt test" – shake salt over wet surface. Salt adheres only to clean surfaces. "Cloth or tissue test" – rub surface with white tissue, filter cloth, or cheesecloth and note if cloth remains clean. "Carbonated beverage test" – pour carbonated beverage into container to be tested. Gas bubbles will adhere wherever there is a film of oil or grease. Bubbles will rise up and out of a clean glass. See "Fluorochromatic Method for Organic Matter on Utensils Under Ultra Violet Light," by Emil Domingo in Soap and Sanitary Chemicals "Official Proceedings Chemical Specialities Manufacturers Association." December 1950, also "Standard Methods for Examination of Dairy Products", 10th ed. 1953, APHA, 1790 Broadway, New York 19, N. Y.

Books and periodicals on Food Preparation and Storage:

"Milk and Food Practice"
H. S. Adams, Commonwealth Fund 1947
"Food Technology"
S. C. Prescott and B. E. Proctor
McGraw Hill Book Co., 1937
"Public Health Engineering", Vol. 11
"The Food Contact" E. B. Phelps.
John Wiley and Sons, 1950
"Food Plant Sanitation," M. E. Parker
McGraw Hill 1948
"The Chemistry and Technology of Food and Food Products," M. B. Jacobs, 3 vols. Interscience Publishers 1951

SOME NAMES SUGGESTED FOR THIS PAGE

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ANSWERING YOUR SANI-QUESTIONS

SANITARY INFORMATION

ASK AND BE ANSWERED

Do you have any questions? If so, please send them to: Department of Public Health, Indiana University Medical Center, Indianapolis, Indiana.

Continued on Page 275

CHANGES IN MILK SANITATION IN THE PAST TWENTY YEARS

C. A. ABELE[1]

The Diversey Corporation, Chicago, Illinois

Twenty years is a relatively short period. Except in a few States, those born in 1937 cannot yet vote. In political history, there have been only two changes in National administration since 1937. With respect to Milk Sanitation, the past twenty-year period represents slightly less than one-third of its life-span to date, which may be said to have begun about 1892. Since the International Association of Milk and Food Sanitarians is now forty-six years of age, the twenty years of Journal of Milk and Food Technology publication cover less than half of its life-span to date.

Although most of the pioneers in Milk Sanitation, and many of the leaders during the 1930's, have passed from the scene, quite a number of currently active milk sanitarians have a personal recollection of conditions in effect and practices followed prior to 1937. These latter, no doubt, realize and recognize that developments in milk production, transportation, and processing, as well as in bacteriological laboratory techniques and milk-handling equipment design, have brought about changes in milk sanitation practice; but some of these changes have been gradual, and their extent and signficance may not be fully recognized by those not directly involved.

To those recruited into milk sanitation within the past three to five years, 1937 may appear to have been an eon ago – at least the "horse-and-buggy era" of the profession. A review of the Tables of Contents of the seven numbers of Volume 1 of the Journal, 1938, (including the initial October, 1937, Convention Number) will shatter any such erroneous concept, and will serve to provide a base with which to compare the Tables of Contents of the 1957 numbers.

Papers on the following subjects, roughly organized into categories, appeared in Volume 1, 1938:

Bactericidal Treatment of Farm Utensils

Bacteriological Procedures – Comparison of culture media - Resazurin test

Bovine Disease – Tests for mastitis

Certification of Milk Laboratories

Homogenization

Milk-Borne Disease – Undulant fever

Milk Containers – Glass bottle pouring lip – Paper cartons

Milk Legislation in small communities

Pasteurization – HTST – Phosphataso test – Recontamination of pasteurized milk

Quality Control – Platform tests vs. farm inspections – Off-the-bottom sediment tests

3-A Sanitary Standards

The physical limitations to the number of papers which could be published in seven numbers of the 1938 format of the Journal also limited the range of subjects covered. Even though it covers only a small number of the aspects of the subject, as conceived in 1938, the foregoing outline makes it apparent that milk sanitation had emerged to a marked extent from the era of emphasis on the control of skimming and watering of milk, on the feeding of brewery and distillery wastes, and on the dipping of milk from cans and filling the containers of customers in milk depots.

In a review of the changes which have occurred in twenty years, a distinction should be drawn between the whole subject of milk sanitation and milk quality control practice. It is in the latter specific phase of milk sanitation that fieldmen, regulatory sanitarians, milk quality control administrators, and laboratory technicians function. Consequently, in spite of the text of the title, this paper will deal primarily with changes noted in milk quality control practice and coverage.

Incidentally, it is a fallacy to consider milk quality control as an entity consisting of a uniform degree of advancement and effectiveness in all jurisdictions at any selected time. Modernization of milk production methods, and of milk transport, the volume of milk pasteurized and the technique of pasteurization, herd management, cattle housing and feeding practices, insect infestation, and even some laboratory procedures, vary through considerable ranges in different geographical areas. In some instances climate is the determining factor in differences; in older urban milk sheds, production customs and traditions or long-established statutory considerations hold milk quality control practice in patterns difficult to adjust to moderization in processing and distribution. Consequently, this enumeration of changes in milk quality control practice, which have occurred during the last two decades, applies specifically neither to all milk sheds nor to any specific one.

Milk quality control consists of a number of distinct

[1]Past-President International Association of Milk and Food Sanitarians, Inc.

activities, some of which are conducted by others than fieldmen and regulatory sanitarians, producers, milk haulers, and plant personnel and managements. These others include veterinarians, dairy extension specialists, field agents of cattle breed associations, and sales representatives of manufacturers of production and processing equipment, and of sanitation supplies. Therefore, in the enumeration and discussion of changes which have occurred in milk quality control practice – or which are imminent – reference must necessarily be made to aspects or phases other than those in which fieldmen and regulatory sanitarians personally engage.

BOVINE DISEASE CONTROL

Bovine tuberculosis had virtually been eliminated by the close of 1937. It was officially declared to be eliminated by December 31, 1942. Elimination of brucellosis is not so far advanced; but the ring test and calf-hood vaccination hold much promise. Since much regulatory practice entails the testing of herds at specified intervals, the discontinuation of area-testing has intensified the pressure for the maintenance of complete test records in the files, and has placed upon the production field personnel the responsibility for obtaining such records.

Mastitis was discussed in Volume 1 of the Journal, and one or more aspects of this problem have been discussed in nearly all of the volumes published since. Control of the incidence of mastitis has virtually been restricted to the treatment of recognized cases. Difficulties encountered in the manufacture of fermented products with milk from herds in which animals are being treated with antibiotics constitute an industry problem; but the potentiality that consumers of milk containing measurable quantities of antibiotic may become sensitized and react adversely to needed dosages of antibiotic, presents a problem in public health. Lacking a rapid test for the presence of antibiotics in milk, sanitarians are at present seriously handicapped in controlling acceptance of milk containing them. But such control is an activity which may have to be undertaken in the future.

HERD MANAGEMENT

This is an aspect of milk sanitation which is distinct from milk quality control, but one in which fieldmen and dairy extension specialists exert much influence. It is evidenced in such voluntarily adopted practices as managed milking, controlled feeding (to avoid off-flavors), withholding of milk for six milkings after antibiotic medication, loose-housing, the installation of a bulk milk cooling tank, or of a pipeline milker, etc. The practices named (except loose-housing) may be assumed to lighten the load of regularatory sanitarians; but the installations impose upon both fieldmen and regulatory sanitarians the responsibility of assuring that the equipment conforms to pertinent 3-A Sanitary Standards, that it is installed so as to facilitate optimum functioning, and that the user is instructed in its operation, cleaning and maintenance.

Most of such supervisory and instructional services—sometimes including calibration of bulk cooling tank measuring devices – are customarily rendered by fieldmen; with regulatory personnel making the final inspection. It must be conceded, however, that the cleaning and bactericidal treatment of bulk milk cooling tanks and milker pipelines is an undertaking of somewhat greater magnitude, and in the latter instance also more complicated, than the manual washing, racking, and disinfection of pails, strainers, etc.; and that when these types of equipment are not effectively cleaned and disinfected, all of the milk passes through or into them and is adversely affected. Avoidance of wide fluctuations in milk quality is assured only by a step-up in the frequency of inspection of farms at which installations of these types of equipment have been made.

LABORATORY

In a limited number of instances, milk sanitarians make bacterial examinations of the milk samples they collect; in some other instances, industry quality control activities are vested in the director of the plant laboratory. Because the determination of bacterial content and chemical composition is so closely integrated with field inspection activities, it is appropriate to review some changes in laboratory activities occasioned by developments during the past twenty years.

Twice since 1937 "Standard Methods for the Examination of Dairy Products" has prescribed modifications of the agar medium used in making plate counts. These improved media have made colonies of thermoduric bacteria (resistant to pasteurization) countable after incubation for 48 hours, and have, in many instances, necessitated the laboratory pasteurization of milk supplies prior to plating, in order to identify those to be kept out of the supply for pasteurization.

Improvement of the phosphatase test procedure between 1936 and 1941, and subsequent shortening of the procedure, has made this test of pasteurized milk samples practically routine. General acceptance of the destruction of practically all strains of coliforms by pasteurization has established the coliform count as

a measure of post-pasteurization contamination, and has made this a routine procedure in many laboratories.

The increased frequency with which other determinations – such as those for the presence of water and other adulterant additives, rinse and swab counts, assays of the effectiveness of detergents and bactericides etc. are made varies with local circumstances and needs.

ROUTINE MILK QUALITY CONTROL FIELD ACTIVITIES

A comparison of milk plant and dairy farm inspection report forms of 1937 and 1957 reveals no striking reduction in the number of items of sanitation covered. The changes in inspection coverage and field activities (not necessarily covered by inspection report times, but usually set forth in instructions and directives) consist primarily of activities augmenting or in addition to those which are regarded as conventional. It might logically be stated there has been an expansion of conventional inspection and other quality control field activities.

In milk plants it has become routine, at fixed intervals, to determine the holding-time of HTST pasteurizers, the time-lag of the flow-diversion valve, the accuracy of thermometers, the effectiveness of leak-protector valves, milk temperatures at cut-in and cut-out pump-stop times, the thermometic lag of the recorder-controller, etc. In plants in which cleaning-in-place is practiced, charts of detergent solution temperature and period of circulation are to be checked, and fittings or parts periodically are to be disassembled for inspection or swabbing. In plants which service manually-operated bulk milk dispensers or coin-operated bulk milk venders, the washing, bactericidal treatment, assembly, and filling of the cans in which pasteurized milk is supplied to the dispensers and venders necessitate additional and possibly intensified inspection activity.

The widespread interest in extraneous matter in milk during the middle and late 1940's induced a surge in off-the-bottom-of-the-can siedment testing, with standardized evaluation of sediment discs, and organized filing of discs or their return to producers. The shift to transportation of milk in bulk has eliminated this, as well as other platform tests, in many areas. But those sanitarians who have thus been relieved of the need to make off-the-bottom-of-the-can sediment tests may shortly find that the sediment tester has become an item of standard equipment, to be used for determining the amount of extraneous matter in the milk in farm cooling tanks.

Installations of bulk milk cooling tanks and of milker pipeline systems—milking parlor or stanchion barn—have more recently imposed rather specialized additional activities upon milk sanitarians assigned to production. The cleaning of these types of equipment entails techniques quite different from that customarily followed in the manual washing of small, easily-manipulated utensils. The knowledge that the cleaning of these types of equipment is not universally and consistently effective is neither exclusive nor restricted. Consequently, some of the dairy farms on which cooling tanks and milker pipelines are in use may, at least for intervals of varied duration, require closer and more frequent inspection than was the practice prior to the installation of the equipment.

The washing and bactericidal treatment of bulk milk tanks and milker pipelines requires more water than was needed to wash and disinfect the smaller equipment previously used. (The milk cans were generally washed at the milk plant or receiving station.) This need for more water may exceed the capacities of some sources of supply, making more frequent determinations of bacterial content, or surveys of proposed additional sources, advisable. Furthermore, disposal of the increased quantity of waste water may also develop situations to which attention must be devoted.

The shift to relay milking in milking parlors—or in pipeline equipped conventional barns—generally leads eventually to the practice of loose-housing of the cows. This differs from the corral penning of herds on the Pacific Coast and in the Southwest, and from the pasturing of the herd between milkings in the South, only to the extent that the enclosure is walled (at least on three sides) and roofed, to provide protection against the weather. The concentration of animals in a limited area, and the handicap to removal and disposal of manure presented by climate during a portion of each year, produce problems in maintenance. Maintenance of sanitation is quite feasible; but control necessitates more intensive supervision.

The growing list of types of dairy equipment covering which 3-A Sanitary Standards have been formulated, and the policy of most regulatory agencies that only equipment which conforms to pertinent 3-A Sanitary Standards be permitted to be installed, confronts regulatory sanitarians and fieldmen and plant managements with the obligation to determine whether equipment does conform. The appearance of the 3-A symbol on equipment eliminates the need for a complete check of sanitation features of each item of equipment, after the first of the type and model have been checked. Nevertheless, it is advisable to make observations of construction and finish of all new equipment installed. (Non-conformance of equipment to which the 3-A

symbol is affixed should be reported to the 3-A Sanitary Standards Symbol Administrative Council.)

MILK QUALITY CONTROL ADMINISTRATION

Developments since 1945 have presented administrators of milk quality control programs with a number of problems, the nature of which could not even be visualized in 1937. Consequently, there was no precedent for the disposition of some of these questions when they arose. Decisions, predicated upon statute, ordinance, or regulation, had to be reached concerning such questions as the permissive use of detergent-sanitizers, the use of detergents and bactericides the active components of which were chemical entities previously unknown in the dairy industry, the cleaning-in-place of milk plant piping and equipment (and milker pipelines), and, in at least one instance, the introduction of bulk milk cooling of dairy farms. Whatever the nature of the decisions reached, procedures for their applications had to be devised and implemented.

It is not the objective of this paper to discuss in detail the various procedures and programs which have had to be evolved to meet developments. Whatever their nature, they represent changes, at the milk quality control administration level, which have occurred since 1937.

In order to implement certain of these procedures or programs, in-service instruction of staff personnel has had to be provided. This in itself, marks a decided change.

The organization of the Conference on Interstate Shipments of Milk, and the system developed for determining the sanitation rating of milk supplies, has imposed upon administrative regulatory sanitarians of exporting States responsibilities and activities they were not formerly called upon to assume and provide.

Inadequacy of personnel and funds to provide all of the services which regulatory organizations are obligated by statute, ordinance, or regulation to render is not a situation which was unknown prior to 1937. However, with costs increasing as they have during the last twenty years, and appropriations failing to keep abreast, it is obvious from the foregoing enumeration of added services, that inadequacies of personnel and funds are being intensified by the assumption or imposition of new services. For instance, the shift from transportation of milk from farms in cans to transport in bulk is rapidly making it no longer possible to determine the quality of a considerable number of supplies, at the plant platform, in a single morning. The sampling of the same supplies, now possible only by visiting each farm, in the same period, would necessitate a vastly increased personnel, and an increase in travel funds.

Probably the most notable change, at the administrative level of milk quality control, which to some extent has already taken place and which will indoubtedly increase in the early future, is the extension of the policy of deputizing haulers to take official milk samples, and, possibly, of registered fieldmen to make routine dairy farm inspections.

If there is a conclusion to be drawn from the foregoing enumeration, which is admittedly incomplete, of changes in milk quality control activities necessitated by developments normally to be expected in a highly competitive industry, it is that the era during which individuals without specialized training could readily be converted into milk sanitarians has passed. Not only must administrators of quality control programs be prepared to cope with technological matters, but those to whom the execution of organized programs is delegated must also be able to act with judgment based on knowledge when circumstances require. Preparatory schooling is the prescription for that object.

TWENTY YEARS OF PROGRESS IN DEVELOPMENT OF EFFECTIVE FIELD WORK IN THE EVAPORATED MILK INDUSTRY

J. C. Flake

Evaporated Milk Association, Chicago, Illinois

This paper will record some of the highlights of the Sanitary Standards program of the evaporated milk industry over the past twenty years, with special reference to the work of fieldmen in the industry. Since it is historical in nature, the material will be presented in chronological order. While each activity will be recorded for a speific year as the approximate time in which it gained major importance, many of these activities have actually been in effect over a period of many years.

Early Developments

The Sanitary Standards program of the evaporated milk industary spans roughly the same period of time as the history of the Journal of Milk and Food Technology and its predecessor the Journal Milk Technology. Twenty years ago, at the time of the origin of the Journal, each evaporated milk company had its own milk quality improvement program. However, there was no coordination of these programs on an industry basis, just as there exists today a lack of uniformity and coordination of the milk quality work of regulatory officials of many cities and states.

In 1937 and 1938 various company officials recognized the need for a uniform quality control program throughout the evaported milk industry. Each company saw the need of a central administration in order to have a uniform approach for the entire industry in the 30 states in which evaporated milk was produced.

During these years a Sanitary Standards Code was formulated to serve as a basis and guide for all future work. This Code was developed with the help and advice of prominent regulatory officials and other experts in the field. The Code was designed to be a practical and effective means of quality control and sanitation for all phases of evaporated milk production from farm to finished product. It is a dynamic document in that it is under continuous review for any changes needed so that it will best serve this purpose. It has not only fulfilled this purpose, but has served as a model Code for the dairy products industry and has been accepted by regulatory officials at all levels.

In 1939 the Code was voluntarily accepted by the entire evaporated milk industry as a basis for quality and sanitation work of each company. It has continued to serve in this capacity to the date.

In 1940 an organization was established in the Evaporated Milk Association to administer the Code under the supervision of the Sanitary Standards Committe of the industry. This Committee, which is composed of policy making officials of various companies, has continued to function throughout the history of the program. One of the reasons for the success of the work is that it has had the attention and supervision of top management of the companies. This applies not only to the broad industry program, but to the handling of individual plant problems, recommendations and reports within each company.

An early job in 1940 was to set up a uniform syetem of platform testing, quality records and rejection of unacceptable milk as established by the Code. This uniform testing and record procedure at all plants has served throughout the program as the basis for milk quality improvement and field work.

In 1941 the emphasis was on effective field work at every plant. The industry early recognized that the central figure in milk quality control is the plant fieldman who must educate and sell the dairyman on all aspects of quality milk production. In contrast to the official sanitarian who makes inspections and issues directions or orders, the fieldman must sell a complete program of efficient production of quality milk. From this date the training program has been aimed at helping the fieldman do this important work.

In 1942 two points of special significance to fieldmen were given attention. The first of these was building up the importance of the fieldman not only in his own estimation, but in that of plant management and the dairyman. In some areas there had been a tendeny to look upon the fieldman simply as a milk solicitor. With the coming of the Sanitary Standards program the scope of his actives and responsibilities was greatly broadened.

Then it was necessary to sell the fieldman on the industry wide program as a practical and effective approach to the problem. This gives recognition to the definition of selling as the transfer of a conviction from the mind of one person to the mind of another. A fieldman who believes in the program and believes the farmer will benefit by it is in a position to sell his ideas, provided he is armed with necessary training,

information and skills. This has been demonstrated for many years by hundreds of fieldmen in the evaporated milk industry.

During the war years of 1943 to 1954 the Sanitary Standards work was continued. Tremendous quantities of evaporated milk were milk packed for the armed forces and lend-lease as well as for the civilian population. The quality work was coordinated with the inspection activities of the Army Veterinary Corps and the U. S. Department of Agriculture which gave full acceptance to the Sanitary Standards Code and program.

EXPANSION OF PERSONNEL TRAINING PROGRAMS

In 1946 the training of fieldmen was expanded through area field conferences and training schools. Originally these were largely in the nature of lectures and reports. However, experience rapidly pointed to group discussions, use of questions and answers, and staged fieldman-farmer interviews as helpful training procedures.

These conferences have spread to annual fieldmen's conferences sponsored by agricultural colleges. Fieldmen and supervisors of evaporated milk companies and members of the Stanitary Standards staff have been called on for important roles in these conferences. They have also served prominently in the development of the program for the state associations of milk sanitarians, and as officers of these organizations.

The year 1947 brought an expansion of the direct training work at plants by members of the Stanitary Standards staff. From this time until the present date, essentially every plant and receiving station has been visited at least once every year by a member of the industry staff This calls for spending two to four days at each unit in checking on the progress of all phases of the program, including a survey of dairy farms with the individual fieldmen. The latter is for the purpose of observing farm conditions, and the work being done by the fieldman and to determine the accuracy of his work and reports when working alone. Constructive recommendations are made to the fieldman on how he can improve the effectiveness of his work. These recommendations are also incorporated in the report to the company official covering all phases of the program at the particular plant This individual attention to the progess and problems at each plant, and the work of the fieldmen, plus detailed reports and recommendations to company officials, have made major contributions to the success of the program.

MILKING EQUIPMENT SANITATION STRESSED

From the start, milking machines had been recognized as a major problem in milk sanitation. The year 1948 saw expanded effort to solve this problem. For improvement in sanitary design and construction, steps were taken to develop 3A Sanitary Standards for milking machines. After numerous conferences and considerable research work this Standard was finally approved by the 3A Committee at their latest meeting on May 13-16, 1957.

In view of the diverse opinions among regulatory officials and others on how the dairyman should clean his milking machine, it was considered wise to develop specific recommendations on care of milking machines. These recommendations were based on a simplified cleaning procedure, with flush-washing and lye solution storage. Results over the years support these recommendations, as measured by a cleanliness of the machines, protection milk of quality, and acceptance by the dairymen. Some of these observations were recorded in a paper on "Milking Machine Sanitation" in the December, 1950 issue of the *Butter, Cheese and Milk Products Journal.*

The years 1949 and 1950 brought increased interest in the problem of milkstone on dairy farm utensils. This problem was aggravated by misinformation and a lack of information as to its real cause throughout the dairy industry. A widely held opinion among personnel of dairy schools and regulatory agencies was that a major cause of milkstone is a hot water prerinse on soiled equipment before it is washed. This was also frequently given by fieldmen as an explanation to dairymen.

Because of a serious doubt as to the basis for this explanation, laboratory and farm experiments have been conducted on this problem. In no case have these experiments pointed to a hot water pre-rinse on utensils as a significant cause of milkstone, with the water at temperatures used on dairy farms, and where a reasonable job of brushing the equipment is carried out.

DISSEMINATION AND UTILIZATION OF RESULTS OF FIELD SERVICE EFFORT

In 1951 and 1952 a great deal of effort was made to organize fundamental information into usable form for the fieldmen so that they could better interpret it to farmers. This was particularly true of bacteriology and its application to milk quality and dairy farm sanitation. A comprehensive list of questions was used in area field conferences to promote discussion by fieldmen and to bring out the proper interpretations and applications of problems in dairy bacteriology. By request of the Editor these questions and answers were published in the March 10, 1951 issue of Hoards Dairyman for education of dairy

farmer readers under the title "Why All the Fuss About Bacteria".

In 1953 a signifiant step was taken to determine whether the Code and program had been kept in tune with advanced thinking on milk production and sanitation. An extensive survey was conducted among publishers in the field, as well as a wide variety of regulatory, educational and industry leaders who are interested in milk production and sanitation, to determine their opinion on the proper approach to many of the problems faced by the dairy industry. The survey gained a high degree of interest, and the results gave firm support to the Sanitary Standards program in its practical application of educating farmers in methods of quality milk production Upon request the results of the survey have been discussed at a number of state meetings of milk sanitarians and have been published in this Journal (April, 1954-pp 132-134), the Journal of Dairy Science (November 1954, pp 1399-1400) and Public Health News of the New Jersey State Department of Health (January 1955, pp 5-8).

In 1954 considerable emphasis was placed on the importance of questions in the farm call, and the fieldman's bringing the farmer actively into the discussion of problems and their solution. Some work had been done on this previously, but from 1954 to the present time it has been a major feature of the effective fieldman-farmer interview.

Perhaps it would be well to mention here a few observations on effective techniques in selling ideas and milk quality to dairymen. First the fieldman must be thoroughly sold himself, and he must have the information and tools, including adequate records on the quality of milk shipped by the farmer. Then he must bring the farmer into the problem and make him a part of the solution. Field work requires a two-way discussion with the dairyman, not simply giving directions. The first reaction of nearly everyone to a suggestion for change is negative. However, when men participate in problem solving they help remove the roadblocks of their personal reactions. Asking people to apply their intelligence and ingenuity to decisions and problems, inspires and stimulates them, and this applies to field work. It is somewhat like the evolution of employee supervision from "tell them" to "sell them" and finally to the present day method of "consult them".

Throughout the program there has been an occasional problem of a fieldman having the opinion that it is a difficult and complex job to keep dairy utensils clean. This is a handicap to such individuals in selling a practical procedure to farmers. A similar attitude has been observed in some regulatory agencies. Therefore, in 1955 and 1956 laboratory and farm experiments were assigned to fieldmen in cleaning farm equipment by methods that varied rather widely in details and thoroughness. These experiments were successful in convincing the fieldmen that it is relatively easy and simple to keep dairy farm utensils clean provided a reasonably thorough system of washing is established and is followed by the farmer after every milking. It is neceessary to stress to dairymen that the procedure should be followed after the evening as well as the morning milking. Some official sanitarians, fieldmen and farmers tend to overlook this point until its importance is brought to their attention.

In 1956 an important step was taken to improve the value of reports to company officials on the progess of the program, and recommendations on individual plants and receiving stations. This is a comprehensive summary sheet which gives the results of observations by the Sanitary Standards staff at the particular plant for four successive years on all phases of the program. This sheet also gives a comparison of the results at the individual plant with the industry averages in the same area. This summary sheet is in addition to the detailed reports on each phase of the program. It is particularly valuable to busy company officials because it gives at a glance the progress of the plant and the fieldman and a comparison with industry averages.

In 1957 the evaporated milk industry and the Sanitary Standards staff look with pride on the accomplishments of the past 20 years. Yet the period is considered as a prologue to even greater progress in the future.

PAST-PRESIDENTS OF THE ASSOCIATION

C. K. JOHNS[1]

Department of Agriculture, Dairy Technology Research,

Ottawa, Ontario

When President Corash asked me to prepare an article on the Past-Presidents, it came as a shock to learn that I was apparently the senior Past-President still active in the affairs of the Assocation! Uufortunately my contacts with most of the Past-Presidents were only at the Annual Meetings, which renders my task more difficult If I fail to do justice to anyone, I hope it will be attributed to my limited acquaintance with them .

Of the earliest Past-President I have no knowledge. Nonetheless, we must remember that if men like C. J. Steffen of Milwaukee had not "seen the vision" and founded the International Association of milk Inspectors in 1911, there might be no International Association of Milk and Food Sanitarians today. At the Cleveland meeting in 1930, however, I met a number of Past-Presidents of the Association who were still active in its affairs. In those days the total membership was only around 200, but a very large percentage managed to attend the Annual Meetings and to take part in the discussions. I can recall particularly Ernest Kelly* of the U.S. Department of Agriculture, Washington, who served as President in 1920, and whose tall slim figure and calm voice was familiar to every member over a long period of years. His succesor, Prof. C. L. Roadhouse, of Davis, California (1921) was a much different type physically having done a good deal of wrestling in his days. His verbal delivery was also quite forceful. New England next came into the picture with H. E. Bowman of Somerville, Massachusetts (1922) and Dr.. Geo. E. Bolling* of Brockton, Massachusetts (1922), who was active for many years in the Committee on Laboratory Methods.

In 1924, Dr. J. Hollingsworth* of Ottawa, Ontario, took office. It was through him that I became interested in the Association, and for this I am greatly indebted to him. Dr. Hollingsworth was one of the old school of veterinarians who played such an important part in the early days of milk sanitation, and his interest continued until his death. A real old-fashioned gentleman, Dr. Hollingsworth, with his spare figure and bearded face, enjoyed the respect and affection of all. His successor was T. J. Strauch* of Richmond, Virginia (1925). A noted figure in the field of dairy resarch was Dr. G. C. Supplee* of Bainbridge, N. Y. (1926), who later went into industry and poineered irradiation treatment of milk to enhance the Vitamin D content. He was succeeded by another Canadian, Dr. W. A. Shoults* of Winnpeg, (1927), a bluff, hearty individual who always said what was on his mind. Prof. Ira V. Hiscock, of the Yale University Medical School, who succeeded him (1928), is widely known and recognised as one of the leaders in public health and is still very active in that field. Dr. Howard R. Estes* of Cleveland came next, (1929) followed by Ralph E. Irwin of Harrisburg, Pennsylvania (1930). I can recall his presiding over the first meeting I attended and I was much impressed by his ability to present his views when the occasion demanded. He has been retired for some years and lives at 510 E. 32nd St., Camp Hill, Pennsylvania.

In 1931 the Association met in Montreal during a late heat wave that all who were there will never forget! Dr. A. R. B. Richmond* of Toronto presided. A trim, dignified figure, his Scottish accent indicated the land of his birth. It was always a matter of keen regret to him that he was unable to continue active in the affairs of the Association. His successor, W. B. (Bill) Palmer* (1932) was more fortunate in this respect, and the man-sized part he played in our affairs, especially in connection with the Journal, is known to all. Bill could always be relied upon to contribute some pungent remarks no matter what subject might be under dicussion! Horatio Newton Parker* (1933), who had lived in New England before going to St. Petersburg, Flordia, was one whose sage advice and enduring interest in milk sanitation served the Association in good stead. His wide knowledge was at every-one's disposal, and many a time I was indebted to him for help.

Paul F. Krueger of the Chicago Board of Health (1934), a clean-out young man in his thirties, was a great contrast physically to his predecessor, whose shinny dome and stooped figure clearly indicated that youth was far behind him. Unlike Parker, whose

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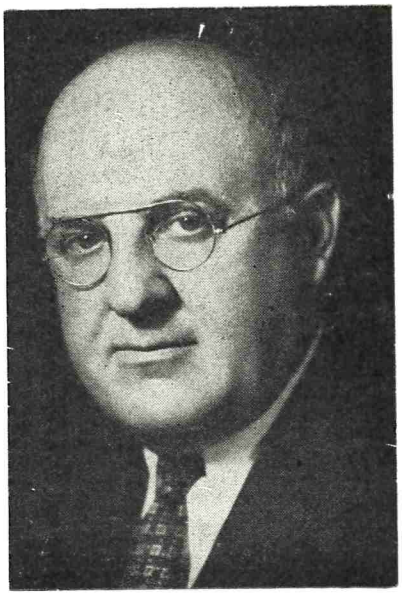
[1]Past President, International Association of Milk and Food Sanitarians, Inc.

*Deceased

interest continued until his death, Krueger has failed to maintain an active interest in the Association.

On the basis of population, Canada would be entitled to recognition in the presidency every thirteenth year. On the basis of membership in the Association, it would probably be every half-century! Consequently, in electing me the fourth Canadian in eleven years, to the presidency in 1935, the Association was certainly going out of its way to emphasize its international character. My successor Dr.



GEORGE GRIM

George W. Grim* of Ardmore, Pa., (1936) was a well known figure over most of this Continent, and his forthright expressions of opinion enlivened many a meeting. Dr. John G. Hardenbergh (1937) was laboratory director of the Walker-Gordon farms at Plainsboro, New Jersey famous for the 'Roto-Lactor'. It was during his term as President that the Journal was started. He later went to Chicago as Executive Secretary of the American Veterinary Medical Association. A quite, consientious type, it is our loss that he has not continued active in the Association.

New England was again represented by Alexander R. Tolland* (1938) of the Boston Health Department, while Texas came into the picture in 1939 with Victor M. Ehlers of the State Department of Health. His successor, Dr. Paul B. Brooks* (1940) of New York State Department of Health had already placed the Association heavily in his debt for his long and active interest. He also served as Secretary-Treasurer from 1929-1936. I can speak from first-hand knowledge when I testify to the keen interest he took in our affairs, and the tower of strength he was to me during my term on the executive board of the Association. An M.D. by training, he was particulary interested in milk-borne disease, and in his weekly articles in New York State "Health News" he displayed an unusual talent for presenting public health educational material in an intensely human and eminently readable manner. We are all very much in his debt.

Leslie C. Frank*, of the U. S. Public Health Service, who served in 1941, is another who made great contributions to milk sanitation and to this Association. Generally recognized as the father of the Standard Milk Ordinance, he did much to raise milk sanitation standards and to promote the idea of giving public health reasons for each requirement. In a discussion he could always present his views clearly and emphatically. It was always a pleasure to listen to him. Dr. Fred W. Fabian (1942) of Michigan State College was a breezy type of individual, well-known for his studies in ice cream sanitation in particular. Of late years his preoccupation with food microbiology has unfortunately prevented him from continuing his activities in the Association. Since his retirement a few years ago he has been gradually slowing down his professional activities and concentrating on his hobbies.

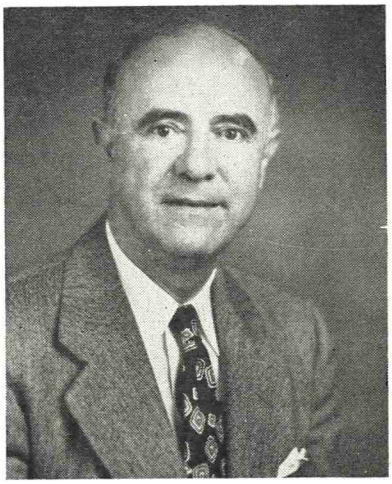
It is fortunate for us that C. A. (Abe) Abele, who presided in 1943 and 1944, has remained active in our affairs. From my earliest recollection "Abe" has been contributing in one way or another to the Association and his more recent activities in connection with the 3A Standards are well-known and widely recognised. An engineer by profession, "Abe" made a name for himself with the Alabama State Department of Health before coming to the Chicago Board of Health. In his more recent association with industry his wide knowledge and experience have been made available all over North America. To recite all his contributions to the Association would be beyond the scope of this article; to fill his place would be a difficult task.

Russell R. Palmer of the Detriot Health Department who presided in 1945 and 1946 is another stalwart entited to a long-service medal. "Russ" with his cigar has been a familiar figure at every meeting of the Association I have attended. He must have the secret of perpetual youth, for he looks no older today than he did in 1930. Russ has made a steady contribution throughout the years, and we hope he can continue to do so for many years to come.

The veterinary profession was again represented in 1947 by Dr. R. G. Ross of Oklahoma State Health Department. His selection for the 1955 "Citation

Award" testifies amply to the contributions he has made in his field.

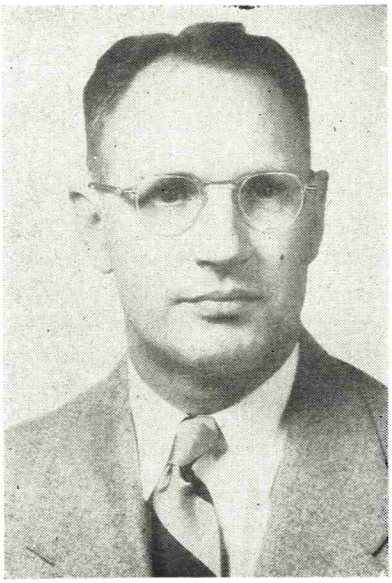
Walter D. Tiedeman, formerly with New York State Health Department was President in 1948. An engineer by profession he gave splendid leadership in New York State, and since his "retirement" has been equally active in directing the laboratory program of the National Sanitation Foundation at the University of Michigan. He also teaches courses in milk and food sanitation in the School of Public Health there.



A. W. FUCHS

Within the Association he has always been one of the main work-horses, and his contributions have been too numerous to recite.

The Public Health Service was again represented in 1949 by A. W. Fuchs who has long been active in our affairs. Since his retirement he too has continued to devote his knowledge and talents to the field of environmental sanitation, first in Israel and more recently in Jamaica. We certainly miss him from our meetings and hope he will soon be able to meet with us once more. Dr. M. R. Fisher (1950) of the St. Louis Department of Health, as befits a veterinarian, has been most interested in the farm end, but has not confined himself to that exculsively. His continuing interest in the Association has been much to our advantage. His succesor, Professor K. G. Weckel (1951) of the University of Wisconsin, has given us much to be grateful for. My acquaintance with Ken goes back to 1931 when we were graduate students together, and it has always given me great pleasure to see the interest he has taken in the Association. His scientific contributions are widely known and were recognized by the "Borden Award" of the American Dairy Science Association in , while his efforts in milk and food sanitation were similarly acclaimed through the "Citation Award" of our Association in 1956. We are indeed fortunate that Ken is willing to take time



K. G. WECKEL

from his busy scholastic activities to work so energetically on our behalf.

The 1952 incumbent, H. L. (Red) Thomasson, is probably known personally by more Sanitarians than any other alive. Coming to us from the Indiana State Board of Health as Executive-Secretary, "Red" has given everything he had to ensure the successful operation of the Association. Our expansion of membership and sounder financial position are due in no small measure to his energetic efforts and we take this opportuntiy of paying tribute to him. His succesor, Harold J. Barnum (1953) has long been active in milk sanitation, first in Michigan and subsequently in Denver, Colorado, where he heads up the milk sanitation work. Denver is fortunate in having a man

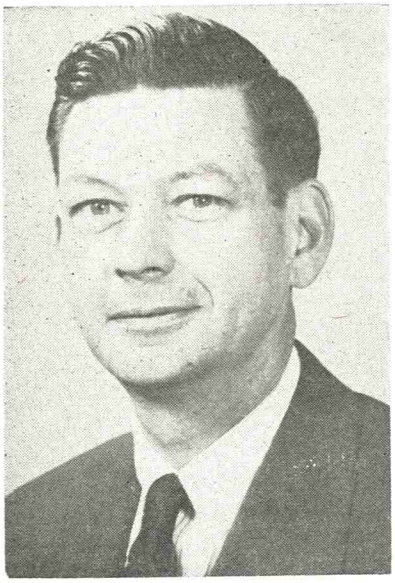
HAROLD J. BARNUM

with his drive and integrity in charge of milk sanitation. Harold has given the Association active, informed leadership, not only during his term of office but for years before and since.

JOHN D. FAULKNER

John D. Faulkner (1954) who succeeded A. W. Fuchs at the U.S. Public Health Service, furnished, along with his Southern accent, forceful leadership and a wide knowledge of all phases of milk and food sanitation. This was recognised last year when he was chosen to represent the United States on the Nations Joint Expert Committee on Milk Hygiene at Geneva, Switzerland. There he made a noteworthy contribution to the discussions, and in his role of Rapporteur has done much too make the report of the Committee so valuable. His successor, Prof. Ivan E. Parkin of Pennsylvania State University, continued the good work in 1955. As an extension man, Ivan has had wide experience in putting ideas across, and this experience has been put to good use the affairs of the Association. We hope we can continue to benefit from his talents and energy. Professor Harold

IVAN E. PARKIN



HAROLD S. ADAMS

S. (Dick) Adams of Indiana University, who held office last year, is another man of widely recognized ability in the field of milk and food sanitation. Besides being author of that very useful textbook "Milk and Food Sanitation Practice", Dick was singled out for recognition in 1955 by his appointment as one of a three-man team selected to visit India, Pakistan and the Philippines and survey and evaluate the progess of community development programs sponsored by the U.S. Foreign Operations Administration.

And so we come to the end of a long list of grand fellows. It has been a privilege to know and to work with them. Our Association has indeed been fortunate in the caliber of the men who have served as Presidents in the past; may we be equally fortunate in the future.

DEVELOPMENTS IN THE PAST TWO DECADES IN SANITATION TECHNOLOGY IN AGRICULTURE

K. G. Weckel

Department of Dairy and Food Industries

University of Wisconsin

To the young, two decades often seems a millenium; to those of us who have experienced this recent era in the Association's history, they are as a fleeting scene. But within this period has transpired many remarkable changes. Especially is this apparent if the comparison is made with the status of agriculture in the world elsewhere, and with that of previous centuries. The changes in agriculture as they relate to sanitation technology should be considered in the light of changes in agriculture as a whole.

The phenomenal biological changes affecting human population in the United States, as well as in other areas of the world, has had counterparts in American agriculture. While we may not have been noticing, almost two million farmers have been dropping from the American farm scene. In 1940 there were 8,800,000 farmers. Today there are only about 6,800,000 farmers who feed some 17,000,000 more people than before, and who produce about 40 per cent more crops. In this period the population of the United States has increased from about 132 to 159 million. In the early part of this century, it required the toil of one farmer to feed about four persons. Twenty years ago his productivity would feed about 12 persons; today each farmer can feed about twenty people. In fact, the excesses of productivity have been and are problems of economic and political importance.

The effects of a prior economic depression resulted in a trend toward reduction in farm family size, and in the number of farm families. The major World War II, which occupied much of the civilized world's efforts in the past two decades, gave tremendous demands for food, and for labor for its production. The developments in farm facilities, and in the nature of agriculture thus have been great. The changes in productivity in agriculture in the past 20 years can be correlated with certain changes in characteristics of farm facilities, as presented in Table 1.

The changes in American agriculture can be associated with three major developments; (*a*) the use of machinery and mechanization of operations; (*b*) the use of fertilizers the better to balance nutrients drawn from the soil, and (*c*) the development and application of powerful preventatives such as insecticides, fungicides, weedicides and the like. It has been estimated that the ravages of biological enemies can cost an equivalent of 30 per cent of man's food and forage. The decline in use of animal draft on farms released much acreage for food for man. It also released the labor nominally used in care of the animals for production of food. The relatively greater productivity of machine power negates much of the effects of adverse climatic weather particularly in periods of planting and in harvest. The production per man hour of farm labor in the past 20 years has increased 400 per cent for feed grains, 150 per cent for hay, and 200 per cent for all crops (3). Among other integrated factors in the increase in production of crop foods may be cited hybridization, close-spacing of plants, fertilization, irrigation, improved crop varieties, weed, brush, fungicide, insecticide and other pesticide controls, improved disease free and resistant stocks, fertilization and soil practices.

The acceptance or adoption of these new techniques into agriculture in the past 20 years has been greatly augmented by educational forces. The mechanics of agricultural extension work has been greatly extended not only through colleges of agriculture and county agents, but also through industrial effort and tools of press, radio, and television. The increased capital investment required for successful modern science farming has demanded greater use of the educational tools by the farmer. An increasingly greater percentage of agricultural output is produced by a smaller percentage of the producers. The introduction of new principles and techniques has become more easily accomplished. Tremendously increased sums of money from both government and industry sources have been and are being invested in research for both agricultural production, and utilization.

The changes in the business nature of the farm enterprise are reflected in part in the development of selected types of cooperatives, as shown in Table 2 (2). They are reflected in part also in the trend towards specialization in the production of certain farm crops, and in a decrease in diversification in the farm enterprise. This has been accompanied also by specialization in food processing facilities.

Beyond these general trends in agriculture in the

TABLE 1—CHANGES IN AMERICAN AGRICULTURAL FACILITIES[1]

	1936	1955	1956
Milk production per cow (pounds)	4,316	5,815	6,006
Number of milk cows on farms Jan. 1	25,196,000		23,213,000 (1956)
			23,028,000 (1957)
Milk production, U. S. (pounds x 106)	102,410	123,454	124,000 (est.)
Number of milk cows on farms (average number during year)	23,727,000	21,232,000	na
Number of farms	6,812,350 (1935)	4,782,416 (1954)	na
Average size of farms (acres)	154.8 (1935)	242.2 (1954)	na
Farms with milking machines	175,000 (1940)		715,000
Farms with bulk milk tanks	na		28,600
Number of farm tractors	1,125,000 (1936)		4,450,000
Number of farm motor trucks	923,000 (1936)		2,800,000
Number of grain combines	190,000 (1940)		1,100,000
Number of corn pickers	110,000 (1940)		700,000
Output per man-hour (1947-49=100)	54		135
Transportation costs in total marketing bill for farm food products (1947-49=100)	36	164	na
Use of plant nutrients (1947-49=100)	37	165	na

na—not available.

(Figures in parentheses refer to year of census)

past two decades, there have been also many developments in agriculture of import to the milk and food sanitarian. It would be difficult to rank their relative significance; some may have nostalgic implications.

The production of milk in total, and per farm, has increased tremendously; a greater portion is being marketed in the bottled fluid form which implies wider use of better standards. There are fewer cows, and fewer farms, and much greater productivity per cow than formerly. The farms have become better equipped in the specialized function of producing milk. There are in use more milking machines, milking parlors, pipe line milkers, pen barns, manure removers, paved cow yards, barn and milkhouse fans, silage unloaders, hay balers, and hay driers.

It is difficult to evaluate the separate and relative effects of two compartment wash and sanitizing sinks in well designed separated milk houses, of new types of dairy brushes, compounded detergents and sanitizers, warm water, room heaters, power refrigeration, protected water supplies, and enclosed trucks.

In the past twenty years much information has been gained on the nutritional requirements and production and growth performances of farm animals. New principles of dairy and farm animal nutrition have come into their own. Recent studies indicate a majority of dairymen regularly purchase large quanities of supplement for efficient farm feeding. The selection of supplements varies with their relative cost-yield effects, and the availability and quality of the farm feeds. The development of preserved forages was greatly expanded in these recent decades.

The widespread practice of hand milking gave way to machine milking. Rapid or "3 minute" milking enabled integration of highly desirable sanitation practices. Integrated was the routine sanitizating of utensils, the germicide washing and wiping of clipped udders, the immersion of hands in the germicide, the regular use of the strip-cup, the teat-cup sanitation dip, and the prompt removal of milk to the milkhouse. Time and motion suddenly became dairywise and was put to profitable use.

Artificial insemination became essential to modern farm dairying following its introduction in the recent years. In 1939, six associations of dairy cattle breeders used artificial insemination; they had 646 members who owned 33 bulls and 7, 539 cows. In 1956, there

TABLE 2—NET WORTH, SELECTED TYPES OF COOPERATIVES, UNITED STATES

Type of cooperative	Net worth, millions of dollars	
	1940	1956
Marketing associations	256	1270
Purchasing associations	74	620
Farmers mutual irrigation companies	197	315
Rural electric cooperatives	3	282
Production credit systems	31	195
Federal land bank system	203	415

were75 studs with 673,970 members, who owned 2,651 sires and 5,764,000 cows.

In the early thirties, unpasteurized milk was still sold extensively in many cities. The dairy industry already had been through the Herculean and expensive task of elimination of bovine tuberculosis involving the development of reliable test techniques, the actual testing of herds, the establishing of compensatory plans for compulsory slaughter, and the development of programs of area accreditation. The history and experience thus learned with tuberculosis has been used to good advantage in the past two decades in the eradication of Brucellosis. Methods of test, as in the agglutination and ring tests, are now established as counterparts in the plan of calfhood vaccination, compensatory payments, and in accreditation. Many states have invoked statute plans for Brucellosis eradication in dairy herds.

Concurrent with the developments in the past 20 years has been the problem of infections mastitis. Earlier means of control were sought in nutritional, herd management, and in sanitation practices; more recently the seemingly uncontrolled use of antibiotics (also a development of the times) perhaps has created for the dairy industry a serious public health problem. The problem of the incidence of mastitis, and its changing character, is as great, if not greater than ever before, and will require the utmost of scientific talents in the forthcoming decade for its eradication and control.

The use of antibiotics and hormones has been extended to other farm livestock for purposes of greater economic animal growth. Much attention has been given to the public health aspects of carry over of these agents into the edible food, and into their effects as spoilage inhibitors.

Agriculture has for many generations relied upon a limited number of insecticides for dairy, and other food crop work. Within the past decade a number of synthetic powerful insecticides have been developed and introduced, and which have had wide application. A statute amendment (The Pesticide Amendment) to the 1938 Federal Food and Drug Act recognizes the necessity of use of chemicals in pesticide control in the production of food crops. Where the need for the chemical is properly established on petition to the U. S. Department of Agriculture, a residue tolerance under the conditions of its use is then established by the Food and Drug Administration. Although hundreds of residual tolerances have thus far been established for fruit and vegetable crops, none has been provided for milk or milk products. The zero tolerance thus required for milk makes necessary careful consideration of the possible carry over of the pesticides from treated forages fed to cows.

The enactment of the 1938 Federal Food and Drug Act brought new principles of interest not only in food processing, but also in its production. The philosophy of caveat emptor was stricken and the consumer given every right to perceive that a food offered for sale was free of hazard. The 1938 Act specifically delimited the addition of poisonous chemicals to foods and which has been administered under the 'per se' doctrine that any chemical of itself poisonous may not be used in a food, with the aforenoted exceptions of the Pesticide Act. It also specifically prohibited the handling of foods under conditions whereby they may or might be contaminated. This has affected sanitary practices in many areas of fruit and vegetable harvesing, transport to market, personnel housing, and in food storage. Thus the stipulations of the Act have been far reaching. They also are the subject of much scruting currently in legislative houses.

There has been extended use of improved priniciples in regulatory milk ordinances; there has been greater uniformity in the ordinances pertaining to farm milk handling. The development of 3A sanitary standards in the past decade has extended to farm utensils, and to the equipment involved in transport of milk from farm bulk milk tanks and in tank trucks to dairy plants. Many state and community laws have been modernized in line with the extensive problem of transport of meat, milk and other foods to greater distances. Compulsory pasteurization of all milk handled in resale is virtually effective in all cities and most states; direct sale of milk from farms has decreased materially.

Although rodent control has been a problem of man for centuries, the past two decades yielded for the first time a relatively safe chemical 'Pied Piper' (Warfarin) that virtually eliminates the rat population of farms and agricultural communities, as well as areas in cities.

Perhaps less noticeable but nonetheless important to sanitation practices in farm food production has been the modernization in conditions of living in the farm home. So extensive has been this development in the past two decades that in many areas modernity in the farm home ranks with that in the urban-city home. Rapidity and convenience of transport between farm and community, and farm and consolidated school, has enabled rapid acceptance of improved standards of living. It has influenced too the families' concept of the significance of sanitary practices not only as they relate to farm home life, but also to food handling. In some areas a high percentage of farmers also supplement their income by employment in nearby cities, which increases the trend, presumably, to modernization of farm life (*4*).

Within the past two decades many improvements have been made in the form of American agriculture; it is probable this trend will continue in order to enable production of food for increased numbers of people anticipated in the coming years. There has been accomplished tremendous advance in the sanitary properties of milk, and other foods. It is probable that changes of similar degree that we have seen, and are now experiencing, will continue in the near future.

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(1) Correspondence. Kenneth Heideman, American Farm Bureau Federation, Chicago, Illinois.

(2) F. L. Garlock *et al.* The balance sheet of agriculture 1956. Agriculture Information Bulletin No. 163. A. R. S. U. S. Dept. of Agriculture, Washington, D. C. November, 1956.

(3) Barton, G. T. and Rogers, R. O. Farm Output. Agricultural Information Bulletin No. 162, A. R. S., U. S. Dept. of Agriculture, Washington, D. C. August, 1956.

(4) The Wall Street Journal, **37**: No. 200, page 1, Monday, July 27, 1957.

QUESTIONS AND ANSWERS

Continued from page 260

"Modern Sanitation". Powell Magazine
"The Sanitarian", N.A.S. 7839 Adoree, Downey, California
"Agriculture and Food Chemistry", A.C.S. Easton, Pa.
"Journal of Milk and Food Technology", IAMFS, P. O. Box 437, Shelbyville, Indiana

QUESTION: Information on Astell roll technique for bacterial counts in milk.

F. B. CLAIBORNE, W. Va. Hygiene Lab.

ANSWER: Information may be obtained from Mr. A. Rowlands, Astell Laboratory Service Co., Ltd., 172 Browhill Road, Catford London, S. E. 6, England. Special equipment is available for the Astell procedure. Main items are the tube spinner and the counter, or an adapter for a regular colony counter. Bottles previously filled with 4.0 ml. of agar are sterilized and cooled. Required dilution is made so that 0.5 ml. of sample will give the required range of colonies. Special seal is replaced in bottle and it is spun for 4 to 5 minutes. Agar solidifies on walls of tube. Incubate, place in counter and one fourth segments are counted to yield total count per 0.5 ml. of diluted sample. See: Report of Committee on Applied Laboratory Methods – 1956. This Journal page 17, January 1957.

QUESTION: With reference to HTST units does vacuum steam have any distinct advantages over hot water? — G. A. MERCURID, Providence, R. I.

ANSWER: Information is lacking on a comparison of the efficiency of bacterial destruction by heat under vacuum compared with steam pressure. No organisms can survive ten minutes of direct exposure to saturated steam at 120 degree C and 15 pounds. While this does not parallel high temperature short time pasteurization conditions, it does indicate that bacterial destruction is a function of time, temperature and pressure. However, entrapped air may lead to serious sterilization failures since it may collect in pockets and serve as an insulator. Hence vacuum systems which remove air from the pasteurization equipment might be of some value where air entrapment is a problem. Existing vacuum equipment used with HTST pasteurizers is primarily for the purpose of removing volatile gases for the improvement of flavor and is not meant to improve the effectiveness of the pasteurization process.

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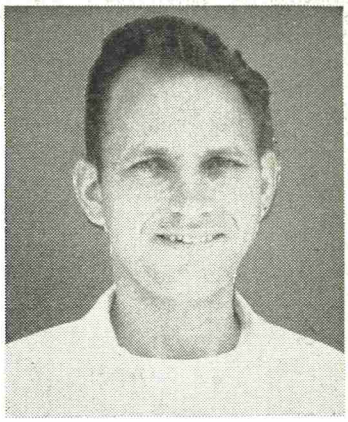

writes MR. J. M. EHRLER, Ehrler's Dairy, Louisville, Kentucky

We have been using bulk milk coolers for a little more than 2 years. At the present time about 75 percent of our coolers are Dari-Kools. We have found Dari-Kools are superior to our other coolers.

The Dari-Kool tanks are much easier to clean. The milk is cooled fast and kept colder. The Dari-Kool 2-speed agitator does a better job. We have also found the bacteria count is lower in our Dari-Kool tanks.

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See the NEW LOW...

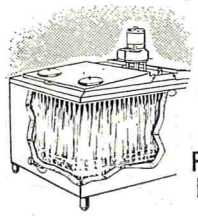
DARI-KOOL® BULK MILK COOLERS

With JUST RIGHT Pouring Height

... plus other new features to help you produce Better Milk—at Greater Profit—with Less Work!

Model shown, DKS-200 (200 gallon capacity)

Also available in 100, 150, 250, 300, 400, 500, 600 and 700 gallon capacities.



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Those 'extra years' of low-cost, trouble-free milk cooling service are built right into a farm-proved, guaranteed Dari-Kool. It's the cooler that outperforms and outsells them all. Just ask any Dari-Kool owner.

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NEWS AND EVENTS

EARL E. HANSEN

Mr. Earl E. Hansen, Director of Sanitation of the San Luis Obispo County Health Department, passed away August 19th, 1957.

Mr. Hansen had been with the San Luis Obispo County Health Department for 30 years and was instrumental in inaugurating the County's entire sanitary program. He was born in Salt Lake City, Utah, December 4, 1897. Earl was a long time member of the International and was very active in the California Chapter.

POSITION AVAILABLE

Sanitarians: Immediate openings in progressive San Francisco Bay Area Health Department. Opportunity for work on a full range of public health problems in rural, suburban and metropolitan areas.

Beginning salary $394 a month with five-step increases to $484 in three years. Excellent personnel policies and benefits.

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for total counts
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for coliform counts
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SPECIALIZED INDUSTRIAL CLEANING
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MATERIALS • METHODS • SERVICE
Technical Service Representatives Located in Principal Cities of United States and Canada

AUTHORIZATIONS TO USE THE 3-A SYMBOL

The concerns the names of which are listed below have been granted authorization to affix the 3-A Symbol to the models of equipment listed, by the 3-A Sanitary Standards Symbol Administrative Council. The Council emphasizes that this is not to be considered a complete roster of concerns which offer equipment conforming to pertinent 3-A Sanitary Standards.

PUMPS—0201

Waukesha Foundry Co.
5 Waukesha, Wisconsin
Amended to include Model Nos. 2 DO, 10 DO, 25 DO, 55 DO, 100 DO, and 125 DO.

L. C. Thomsen & Sons, Inc.
72 Kenosha, Wisconsin
Model Nos. ODA, OSD, 1SD, 1½SD, 2SM, 3SM, 4SM, OSDU, 1SDU, 3SDU, and 4SDU.

AUTOMOTIVE TRANSPORTATION AND PICK-UP TANKS—0501

Jacob Brenner Co., Inc.
70 Fond du Lac, Wisconsin
Model Nos. 57BMPT and 57STMT

Progress Manufacturing Co.
71 Arthur, Illinois
No model numbers

FITTINGS FOR EQUIPMENT AND SANITARY PIPING—0800-0806

L. C. Thomsen & Sons, Inc.
73 Kenosha, Wisconsin
Model numbers listed in reprints of Sanitary Standards, and Supplements 2, 4, and 5.

HOLDING AND/OR COOLING TANKS—1300

Creamery Package Mfg. Co.
11 Chicago, Illinois
Amendment, to include Model VA-375.

Paul Mueller Company
12 Springfield, Missouri
Amendment, to include Models M and MS.

Brown Equipment Company
19 Coalville, Utah
Amendment, to include Model Nos. B-450, B-1250, B-2500, and B-3000.

Mojonnier Bros. Co.
41 Chicago, Illinois
Amendment, to include Model 1000V.

MANUALLY — OPERATED BULK MILK DISPENSERS—1500

(The names of holders of authorizations to affix the 3-A symbol to equipment of this type could not be published until 12 months after publication of the Sanitary Standard.)

Monitor Process Corporation
23 Jersey City, N. J.
Model Nos. MF20-1 and MF20-2.

Norris Dispensers, Inc.
62 Minneapolis, Minnesota
Model Nos. N-5-SM, N-10-SM, and N-15-SM.

United Refrigerator Company
68 Hudson, Wisconsin
Model Nos. UM-57, UM-107, and UM-157. UMT-57, UMT-107, and UMT-157.

American Industries, Inc.
74 Minneapolis, Minnesota
Model Nos. B-5, B-10, and B-15.

CORNELL HOLDS DRIVER TRAINING CONFERENCE

The Department of Dairy Industry held a training school for farm bulk tank truck drivers on Wednesday afternoon and evening, August 21.

In spite of the truck drivers strike twenty-four men attended the program.

Notices were sent out with the aid of county agents only to the counties adjoining Tompkins because this training school will be offered at various strategic points around the state this winter.

Representatives were from the Dairymen's League, Sheffield Farms, Piorlat of Watkins Glen, Marble Farms of Syracuse, Newark Milk & Cream of Owego, Four County Creamery of Harford, Syracuse Department of Health, New York State Department of Health, New York State Department of Agriculture and Markets and a number of independent haulers.

Dr. White spoke on basic sanitation, composition of milk, fundamentals of bacteriology and judging of milk quality. Professor March discussed the proper procedure for sampling, measuring and picking up of milk on the farm by tank truck drivers.

To date there are 2,828 bulk tanks on farms in New York State and 20 bulk pick-up routes.

THE *Perfection* PLAN Saves Milk Quality Detects Mastitis Promptly

NOW — MORE THAN EVER BEFORE — YOUR MILK FILTERING RECOMMENDATION CAN REALLY HELP YOUR PRODUCERS

The PERFECTION Plan offers a revolutionary PLUS in milk filtering not available anywhere else. It solves *two* problems. (1) Producers get standard Perfection milk filters — tough, speedy, sediment-retentive — for really *clean* milk . . . . . PLUS (2) DETECTOS — a new BLACK milk filter specifically designed for prompt, easy mastitis detection. There is no extra handling—no extra work. *Two way* protection against loss. Recommend the PERFECTION PLAN to your producers for more premium milk; a healthier herd; and more milk operation profit.

SCHWARTZ MFG. COMPANY
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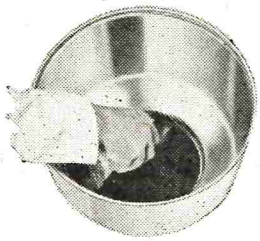
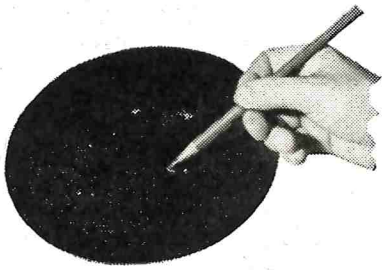
THIS IS "PERFECTION PLAN" PROTECTION



The milk is filtered through a standard white Perfection milk filter daily. The dried disc should be examined for evidence of sediment or garget. At regular intervals — DETECTOS are used to help rule out the presence of mastitis infection much more readily.



DETECTOS milk filters are made of BLACK fibres instead of the usual white. Against this black surface, the WHITE flakes or clots, which indicate the presence of mastitis infection, show up sharply. Infection in the herd can be spotted easily, promptly and regularly.

If signs of infection are present — spread of disease can be prevented through careful examination of each quarter of every cow with the strip cup or plate. Then the infected animal can be segregated for treatment and cure.

It's a simple plan that has the virtue of becoming 'habit forming'. And it helps protect not only the producer's milk but his herd as well.

Accelerated Detergency

KLENZADE

Chlorinated CLEANERS

Non-Foaming

KLENZADE HC-90

Accelerated detergent action for recirculation cleaning where no foam is desired. Sets a new "high" in cleaning tanks, tank pickups, storage vats. Chlorination sharpens detergent effectiveness of top quality ingredients.

Foaming

KLENZADE HC-8

Fast working manual detergent with a power-assist from chlorine. Ideal for cold milk cleaning, farm bulk tanks, general equipment. Non-corrosive, safe for hands, yet packed with stepped-up cleaning action and rapid draining.

Ask Your Klenzade Representative About These Newer Cleaning Routines

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First in Cleaning Chemicals and Techniques

THE ONLY *Approved* SANITARY METHOD OF APPLYING A U. S. P. LUBRICANT TO DAIRY & FOOD PROCESSING EQUIPMENT

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CONTAINS NO ANIMAL OR VEGETABLE FATS. ABSOLUTELY NEUTRAL. WILL NOT TURN RANCID — CONTAMINATE OR TAINT WHEN IN CONTACT WITH FOOD PRODUCTS.

SANITARY—PURE

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This Fine Mist-like **HAYNES-SPRAY** *should be used to lubricate:*

SANITARY VALVES
HOMOGENIZER PISTONS — RINGS
SANITARY SEALS & PARTS
CAPPER SLIDES & PARTS
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GLASS & PAPER FILLING MACHINE PARTS
and for ALL OTHER SANITARY MACHINE PARTS which are cleaned daily.

The Modern HAYNES-SPRAY Method of Lubrication Conforms with the Milk Ordinance and Code Recommended by the U. S. Public Health Service

The Haynes-Spray eliminates the danger of contamination which is possible by old fashioned lubricating methods. Spreading lubricants by the use of the finger method may entirely destroy previous bactericidal treatment of equipment.

PACKED 6-12 oz. CANS PER CARTON SHIPPING WEIGHT—7 LBS.

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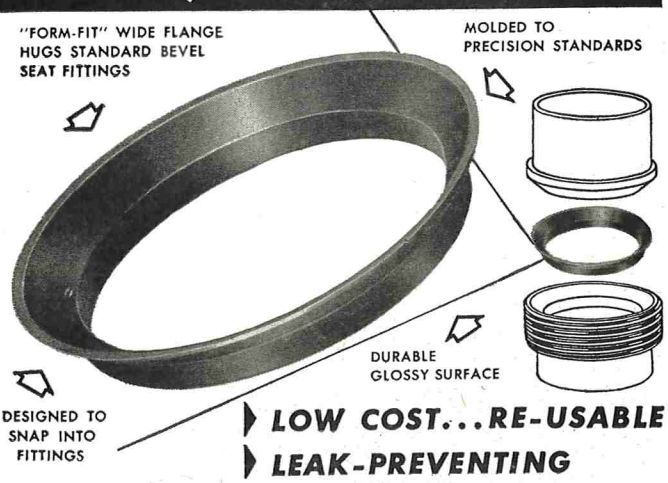

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Check these SNAP-TITE *Advantages*

- Tight joints, no leaks, no shrinkage
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Available for 1", 1½", 2", 2½" and 3" fittings.
Packed 100 to the box. Order through your dairy supply house.

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Thanks Much...

YES—thanks very much, you Milk Sanitarians—for your partnership in programs that have promoted improvements in handling and safeguarding nature's most nearly perfect food.

THANKS for your faith and belief that today's good milk can be made better for tomorrow.

THANKS for your willingness to try new techniques and new procedures to make this belief a reality.

THANKS for your dedication to the cause of good health and your efforts to assure man that Grade A milk and milk products are safe products for his and his family's consumption.

THANKS for your warmth, your humor, and your patience in helping resolve a problem when something goes slightly awry.

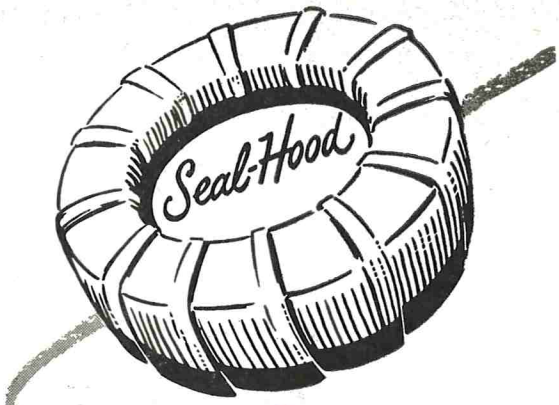
THANKS for the great milk improvement retrospective "look-see" that all of us in the milk industry now have—improved products, longer keeping products, better labeled products, fewer trade barriers, freer flow of milk from bountiful areas to needed areas.

THANKS for your wisdom and cooperation in helping our industry nutritionally tailor needed milk products to aid the physicians and nutritionists in their effort to build happier, healthier and longer useful lives.

Yes, for all this and much more that you fine sanitarians have done, we take our hats off to you in reverence and respect.

And again we say, "*Thanks much.*"

Dean Milk Company
Franklin Park, Illinois



and

keep milk fresh to the last drop

• From dairy to consumer these modern, practical closures completely seal the bottle mouth. On the capping line, and during delivery, hands never touch the pouring lip.

In the home, this cleanliness and sure protection continues. Seal-Hood and Seal-Kap closures snap tightly back on after each use, keeping milk at the peak of freshness and purity until the bottle is empty. And because both cap and seal are combined in one unit, users enjoy far easier handling than with ordinary caps.

Capping with Seal-Hood and Seal-Kap is a *single operation* process. Naturally, dairymen benefit from sizable savings in milk loss, time and maintenance costs . . . because no separate hooder is needed.

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The constant search for better sanitation in dairy and other food products is helping build healthier Americans. And here at Diversey, we consider it a privilege to be associated with these increasingly higher standards of purity and quality.

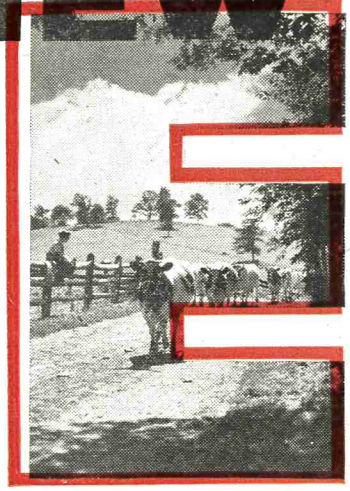
It's a fact that today your high professional standards of sanitation are achieved more efficiently than was the case just a relatively few years ago. Diversey's constant research and product improvement in cooperation with sanitation authorities is helping to make possible *better* sanitation at lower costs. That's why farmers, dairymen, food processors everywhere depend on a wide range of Diversey products for hundreds of specialized jobs.

Our experience in "the science of sanitation" is always available to sanitarians and food technologists. Call on your nearby Diversey D-Man, one of our trained corps of sanitation specialists. Or write if we can be of help to you. The DIVERSEY Corporation, 1820 Roscoe Street, Chicago 13, Ill.

DIVERSEY

SANITATION PRODUCTS

See the NEW MODEL E



BULK COOLERS BY Steinhorst

SINCE 1908

Emil Steinhorst & Sons, Inc. has been manufacturing milk cooling products for the dairyman since 1908! Today, this experience is bringing you the best in bulk coolers — the new Steinhorst Model E!

E CONOMY
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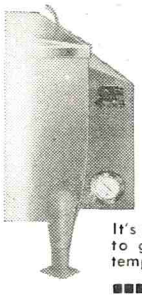
E NGINEERING-PLUS *

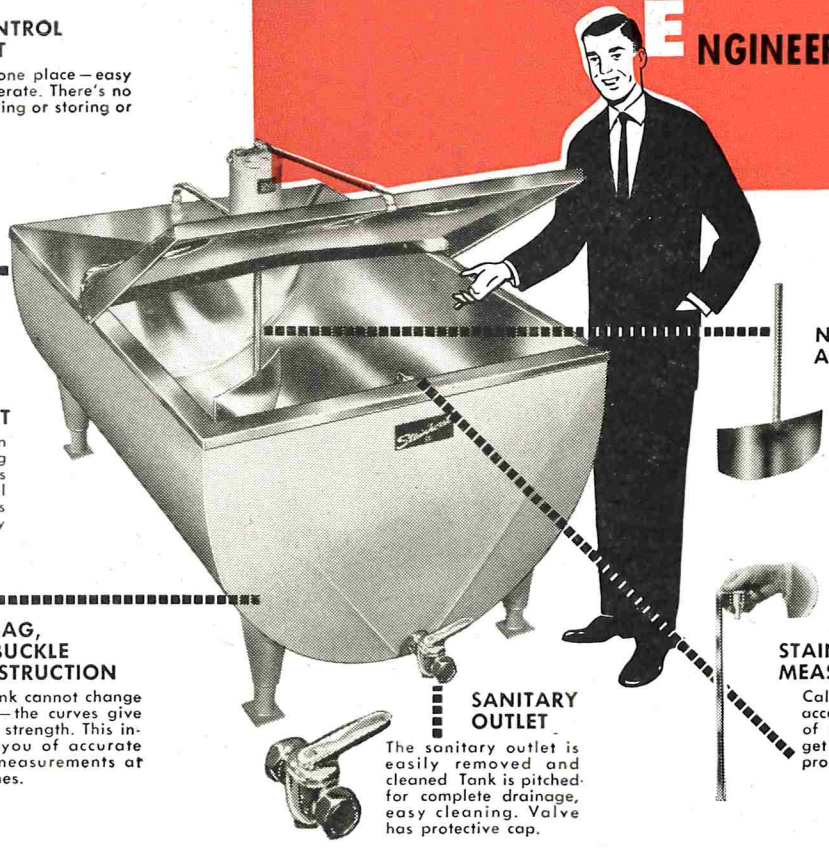


FINGERTIP CONTROL ARRANGEMENT

All controls are in one place — easy to read, easy to operate. There's no guessing about cooling or storing or agitating.

DIAL TYPE THERMOMETER

It's right by the controls to give you accurate temperature reading.



CONVENIENT WORKABLE HEIGHT

34"

The Steinhorst design gives more cooling surface under less milk and less overall height. Everything is easy to reach — easy to clean!

NEW EFFICIENCY AGITATOR

The Steinhorst agitator is specially shaped and curved to provide complete and non-churning milk circulation. Removable for easy cleaning.

NO-SAG, NO-BUCKLE CONSTRUCTION

The tank cannot change shape — the curves give added strength. This insures you of accurate milk measurements at all times.

SANITARY OUTLET

The sanitary outlet is easily removed and cleaned Tank is pitched for complete drainage, easy cleaning. Valve has protective cap.

STAINLESS STEEL MEASURING STICK

Calibrated to give you accurate measurement of your milk . you get paid for all your production.

DEALER INQUIRIES INVITED! *WRITE FOR COMPLETE DETAILS!*

UNCONDITIONAL GUARANTEE

Steinhorst Model E Bulk Coolers are unconditionally guaranteed against buckling, sagging or distortion under any milk load.

EMIL STEINHORST & SONS, Inc.

DEPT. 9-RN • UTICA 3, NEW YORK

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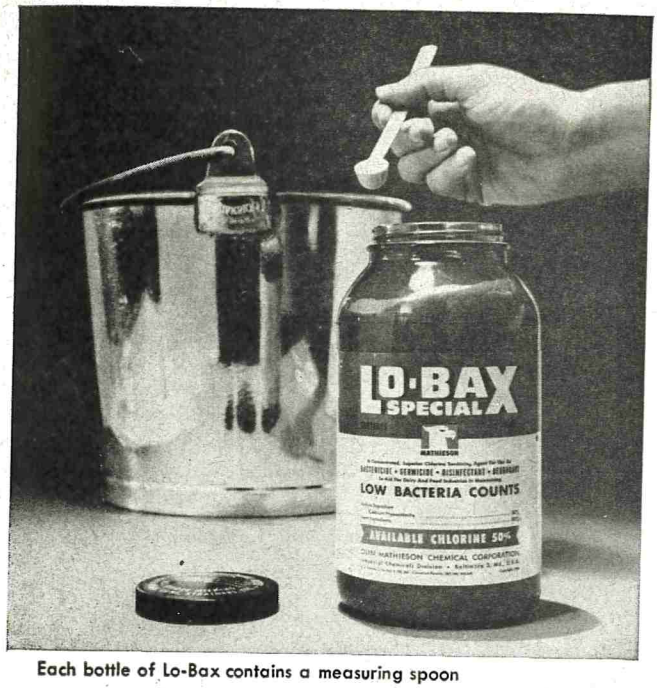


Each bottle of Lo-Bax contains a measuring spoon

a little Lo-Bax goes a long way in protecting milk quality

Wherever bacteria threaten milk quality, the chlorine sanitizing action of Lo-Bax Special or LoBax-W (with wetting agent) gives quick and effective kills to minimize spoilage and rejects.

Just one-half teaspoonful of fast-dissolving Lo-Bax Special* gives two gallons of rinse solution for gentle, positive protection of hands, cows' udders, milking machine parts, utensils and other danger spots.

Here's a product whose long and increasing success is due to *results*. Tip your suppliers off to Lo-Bax today . . . or, better still, supply them with the free samples and informative literature Olin Mathieson will gladly send you. Just write.

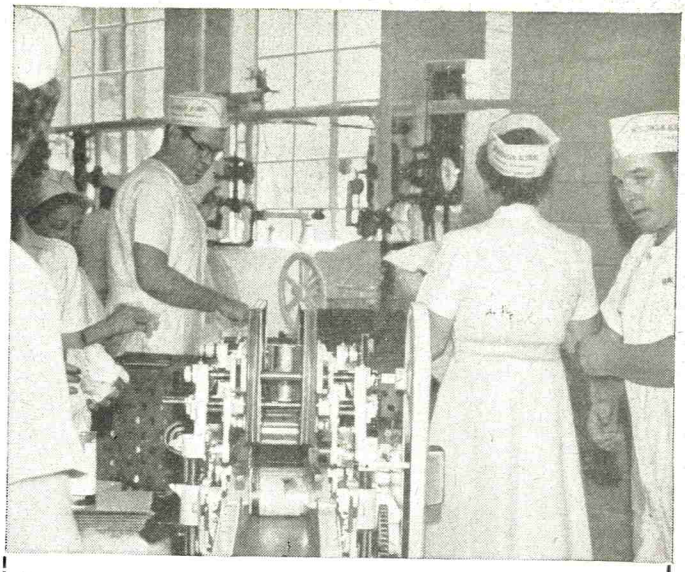
*or one teaspoonful of LoBax-W

Lo-Bax® is a trademark

4691

LO-BAX

OLIN MATHIESON CHEMICAL CORPORATION
INDUSTRIAL CHEMICALS DIVISION • BALTIMORE 3, MD.



To ensure a quality concentrate, every piece of equipment used in the canning line is made of stainless steel. And complete sterilization is maintained from the start and until the concentrate is sealed in the sanitary open-top type of container.

Sanitarians Know These 8 Facts!

1. Pure milk demands pure vitamin additives, and Vitex vitamin concentrates are the highest in quality!

2. It is fundamental that in the modification of milk (or in the addition of any modifiers to milk) only ingredients having the same sanitary quality be used.

3. The dairy ingredients in Vitex vitamin D milk concentrates are derived only from Grade A milk.

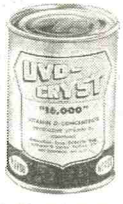
4. The dairy ingredients used in Vitex vitamin D concentrates are processed only in Grade A dairy plants.

5. Each lot of dairy ingredients used in Vitex vitamin D concentrates is evaluated for sanitary quality by stringent methods of bacteriological procedures.

6. Vitex vitamin milk concentrates are processed in a modern, regularly inspected plant designed especially for the product. It is given regular multiple sanitary inspection.

7. Equipment used in processing Vitex vitamin D milk concentrates complies with the 3A Sanitary Standards for dairy equipment.

8. Vitex vitamin milk concentrates represent the highest of standards in dairy products processing techniques. They are used in America's outstanding and finest dairies.



VITEX LABORATORIES

50 Years
NOPCO

A Division of NOPCO CHEMICAL COMPANY
Harrison, N.J. • Richmond, Calif.

Pioneer Producers of a Complete Line of Vitamin Concentrates for the Dairy Industry

Heil quality . . . helps protect milk purity!

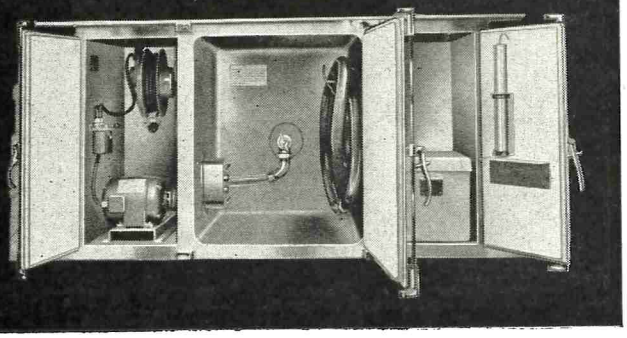
Where you find good, fresh milk chances are Heil helped deliver it . . . because more milk is delivered in Heil tanks than all others combined.

For more than a quarter century Heil has been recognized as a leader in sanitary milk tank design.

The list of milk-tank "firsts" include: Removable snap-on door gaskets for easier cleaning, 3-compartment cabinet for sanitation by isolation, and Frigid-Lite* plastic tanks — newest and most advanced in the industry. Other sanitary features are wall-mounted pump, clamp-type valve, and single gasket for manhole and dust cover.

Heil takes pride in helping sanitarians keep milk pure and refreshingly good!

Sanitary 3-compartment cabinet is handy to use and keep clean. Plastic doors are hermetically sealed providing superior insulating efficiency, have snap-on gaskets, are warp-proof and dust-tight.



THE HEIL CO.

Dept. 313, 3000 W. Montana St., Milwaukee 1, Wisconsin

Factories: Milwaukee, Wis., Hillside, N. J., Lancaster, Pa.

Heil products for the dairy industry include pick-up and transport tanks of stainless steel and FRIGID-LITE* plastic, cylindrical and rectangular milk storage and cooling tanks.

*Registered trademark

Laboratory Tested and Controlled

TO DO A BETTER SANITIZING JOB

EVERY TIME

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This Control No. Guarantees
POTENCY
UNIFORMITY
QUALITY

THE ORIGINAL QUATERNARY AMMONIUM GERMICIDE

Insist on getting only

GENUINE **Roccal** BRAND **SANITIZING AGENT**

Reg. U.S. Pat. Off. and Canada

In the Dairy Industry, more than in any other industry, the importance of using only the best in sanitizing methods cannot be over-emphasized.

In ROCCAL the *original quaternary* ammonium germicide, the dairy industry is offered a product that is laboratory controlled and tested. The uniform quality of ROCCAL means **uniformly** good results in doing a proper sanitizing job.

ROCCAL is a powerful germicide. In recommended dilutions, it is non-poisonous, non-irritating to the skin, virtually odorless and tasteless.

USES IN DAIRY INDUSTRY
To Sanitize:
- MILKING MACHINES
- TEAT CUPS
- COOLING TANKS
- TANK TRUCKS
- MILK CANS
- WEIGH TANKS
- PASTEURIZERS
- SEPARATORS
- BOTTLE FILLING MACHINES and AS HAND and TEAT WASH

In the dairy, ROCCAL can be used for every sanitizing job. For tank trucks, weigh tanks, pasteurizers, separators, bottle filling and capping machines, to keep walls and floors sanitary.

Try ROCCAL for just one week and watch your bacteria counts go down . . . down . . . down!

SEE YOUR LOCAL DAIRY SUPPLY DEALER

Offices in principal cities throughout the United States

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FORTIFY YOUR MILK WITH DELTAXIN (R) THE PUREST KNOWN FORM OF VITAMIN D_2.

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Media for MYCOLOGY

DIAGNOSTIC . . . . . for the isolation, identification and cultivation of pathogenic fungi. These media are also widely used in phytopathological studies. Several are neutral in reaction, giving optimum conditions for growth of a variety of fungi. The following may be prepared as selective media by the adjustment of reaction, addition of antibiotics or other agents:

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Bacto-Sabourand Dextrose Agar
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Bacto-Littman Oxgall Agar
Bacto-Mycological Agar
Bacto-Mycological Broth
Bacto-Corn Meal Agar
Bacto-Corn Meal Agar with Dextrose
Bacto-Bean Pod Agar Bacto-Prune Agar Bacto-Lima Bean Agar

CONTROL . . . . . for sanitary and sterility procedures as well as for general use in mycological procedures:

Bacto-Sabourand Maltose Broth
Bacto-Sabouraud Liquid Medium
Bacto-Malt Extract
Bacto-Malt Agar
Bacto-Neurosporo Culture Agar
Bacto-Potato Dextrose Agar
Bacto-Mildew Test Medium*
Bacto-W.L. Nutrient Medium
Bacto-W.L. Differential Medium

CLASSIFICATION . . . and nutritional studies of fungi:

Bacto-Yeast Morphology Agar
Bacto-Yeast Carbon Base
Bacto-Yeast Nitrogen Base
Bacto-Czapek Dox Broth
Bacto-Czapek Solution Agar
Bacto-Vitamin Free Yeast Base

THE DIFCO MANUAL, *NINTH EDITION*,
including descriptions of these media and their use, is available on request.

DIFCO LABORATORIES
DETROIT 1, MICHIGAN

*Write for booklet giving highlights of single-service spoon study recently made by William T. Ingram, Consulting Engineer and Adjunct Professor of Public Health Engineering, New York University.

The smoothness of a disposable spoon becomes important in the light of a recent study* which reveals that a spoon is put into the mouth 10 to 60 times while a person is eating an average portion of ice cream, 40 to 60 times while eating a piece of pie. No other utensils are put into such frequent contact with mouth membranes. This study proved that OWD Ritespoon will not scratch nor cut. Microphotographs show that OWD Ritespoons are the smoothest of all those examined. There are no sharp, jagged and splintered edges. Pressures exerted while eating with an OWD Ritespoon will not bruise nor cut the gums, nor will fragments of the utensil be ingested with food.

We will gladly send you samples, literature.

O.W.D. Ritespoon®

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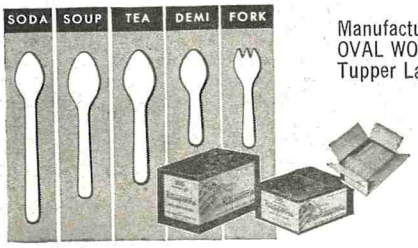
COMPLETELY SATISFACTORY SINGLE-SERVICE UTENSILS

• Cleanest on delivery • Cannot be reclaimed and used repeatedly—one use destroys appearance and utility • Smooth—no cutting edges nor splinters • Exclusive, protective sanitary packaging • The only wooden spoon with the true shape of metal ware, strong, rigid, tasteless, odorless. Pure wood only—no dyes nor additives • The only fully shaped single-use spoon available, individually sealed at the factory in tough sanitary paper envelopes, assuring absolute sanitation under the most extreme conditions • Every spoon perfect • Available in 4 sizes, 3½", 5", 6", 7", and OWD Ritefork 4¾".



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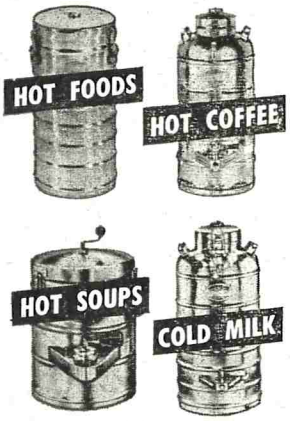
THE "AERVOID" CENTRAL KITCHEN SYSTEM HAS PROVED ITS WORTH IN ALL FIELDS OF MASS-FEEDING



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To-day's "Modern" trend toward centralization of food preparation is a milestone toward Economy, Better Quality and Higher Sanitary Standards.

Into this new picture nothing fits like AerVoiD's Portable, Stainless-Steel, High-Vacuum Insulated, food, soup and liquid Carrier-Dispensers. AerVoiDs alone provide the proven quality and durability to survive under rough usage, spreading their cost over a long period of uninterrupted service.

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BOTH CLEANS AND SANITIZES !

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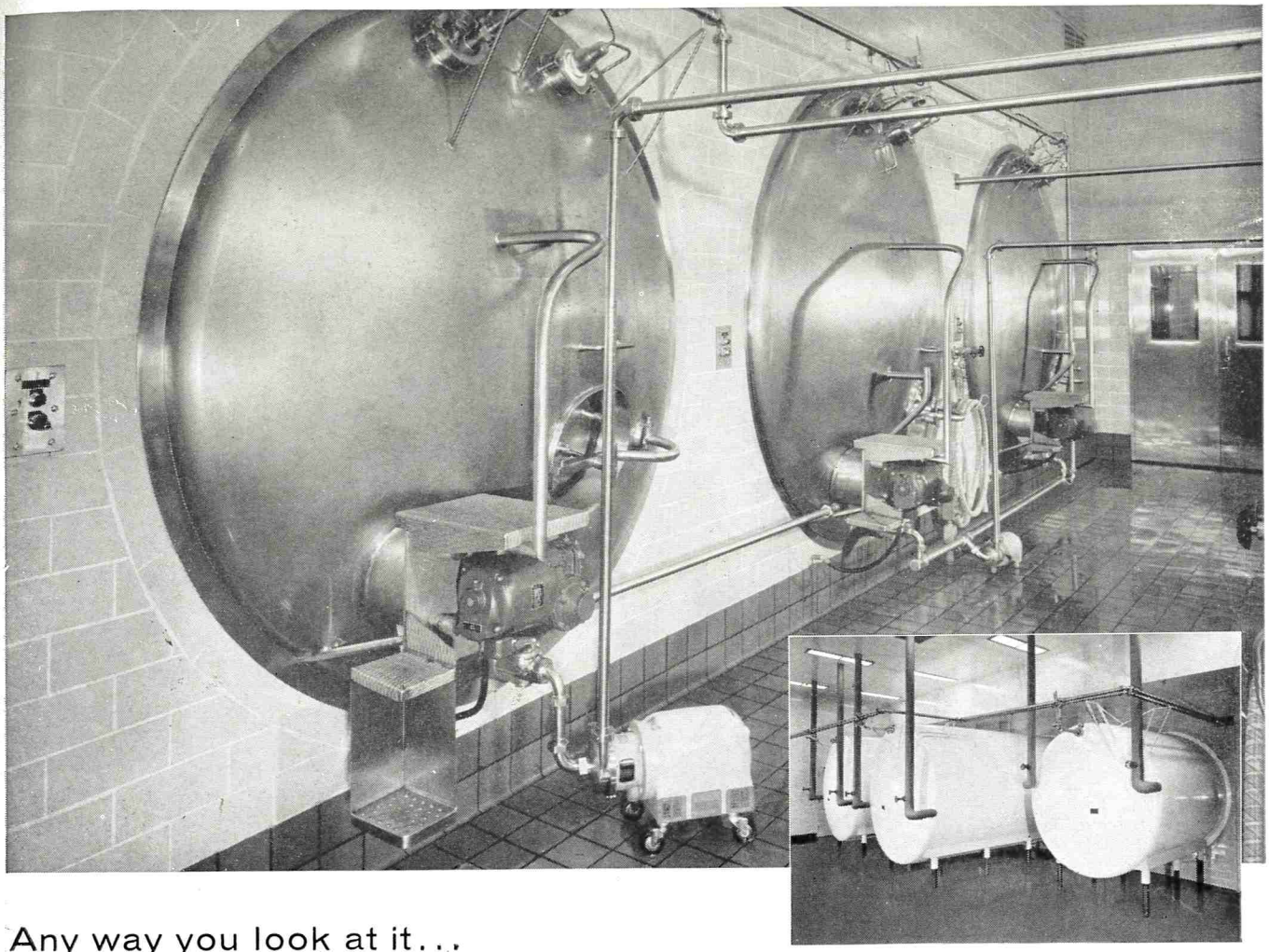
FOR SALE: Single service milk sampling tubes. For further information and a catalogue, please write: Bacti-Kit Co. P. O. Box 101, Eugene, Oregon.



Clean design keynotes this CP Cylindrical Storage Tank installation at Fred Meyers, Inc., Portland, Ore. Shown are one 2500-gallon and two 5000-gallon sweet water-cooled tanks, for incoming raw milk. Wheeled pump in foreground (large picture) is a CP Centrifugal Stainless Steel Sanitary Pump.

Any way you look at it...
for BEST-ENGINEERED PROTECTION
Choose CP® STORAGE TANKS

Handsome as it is, what you see in this well-engineered CP Cylindrical Storage Tank installation only tells half the story. What you don't see is mighty important to overall, higher operating efficiency, greater convenience and lower maintenance costs.

Let's Look At:

The Inside—here you'll see a heavy stainless steel inner lining CP precision welded, ground and polished to provide a clean unobstructed surface for your product.

The Agitator—this vital part of your CP tank is scientifically designed to move your product gently but thoroughly over the refrigerated surface for thorough mixing and to provide fast cooling.

In Between—yes, between the heavy outer shell and the strong stainless steel interior you'll find a layer of high-efficiency insulation that assures safe holding and effective cooling with minimum refrigeration input.

Whether you are planning a new plant, expansion or updating of present facilities, it will pay you to get all the plus advantages and economies available in CP Storage Tanks — made by the only builder of *both* storage tanks and refrigeration equipment. (Ask your CP Representative, or write for Bulletin B-226.)

CP Storage Tanks are available in cylindrical or rectangular models, cold-hold or refrigerated models (direct expansion or sweet-water) in 1000 to 10,000 gallon sizes.

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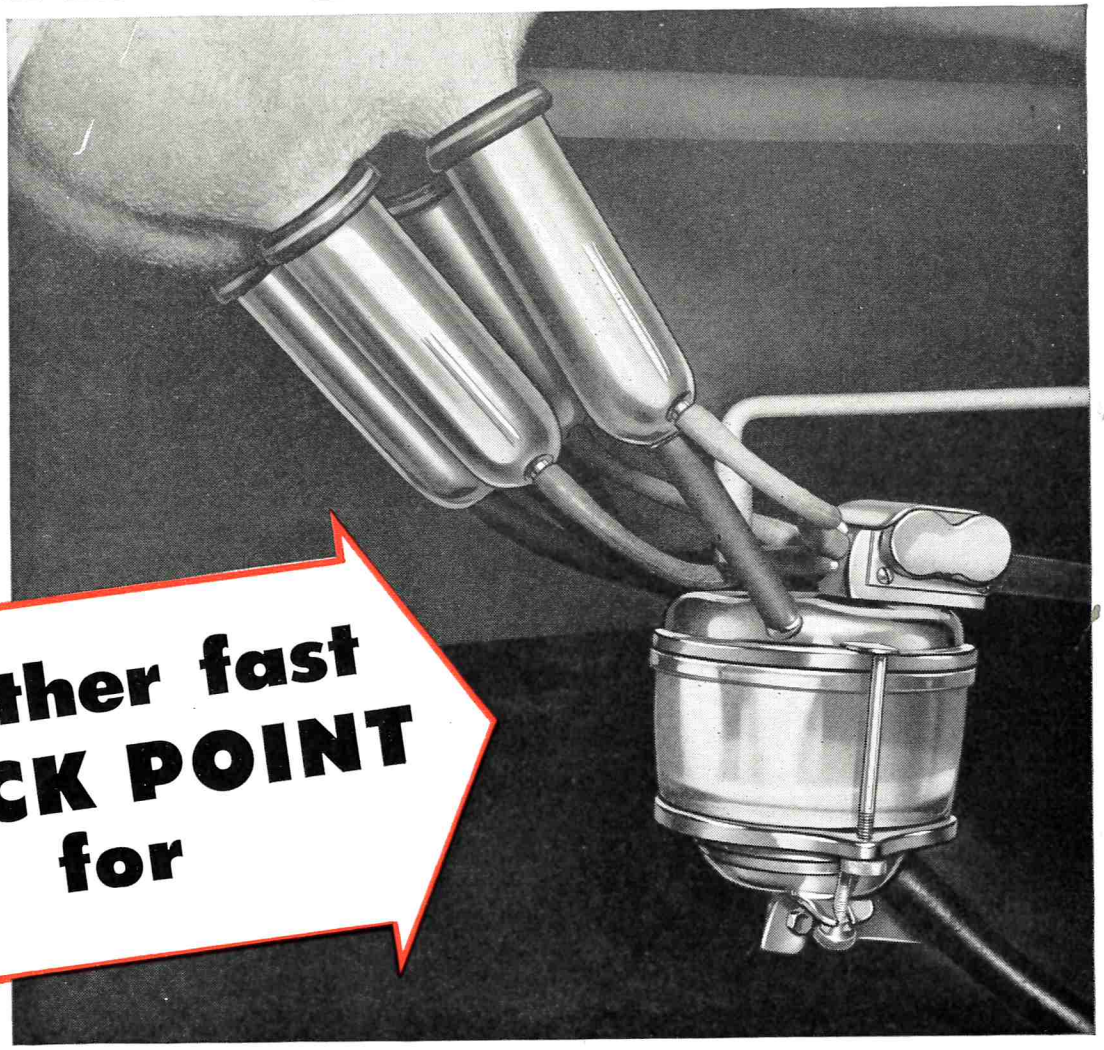

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SURGE clean milk

With Surge Siphon Breaker Cups or Surge Surcingle Breaker Cups, you can spot trouble quickly . . . because you can see what you're doing inside.

Here's where the strainer pads are located, too . . . making sure nothing but clean milk enters the pipe line and holding tank.

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