

VOLUME 18

NO. 4

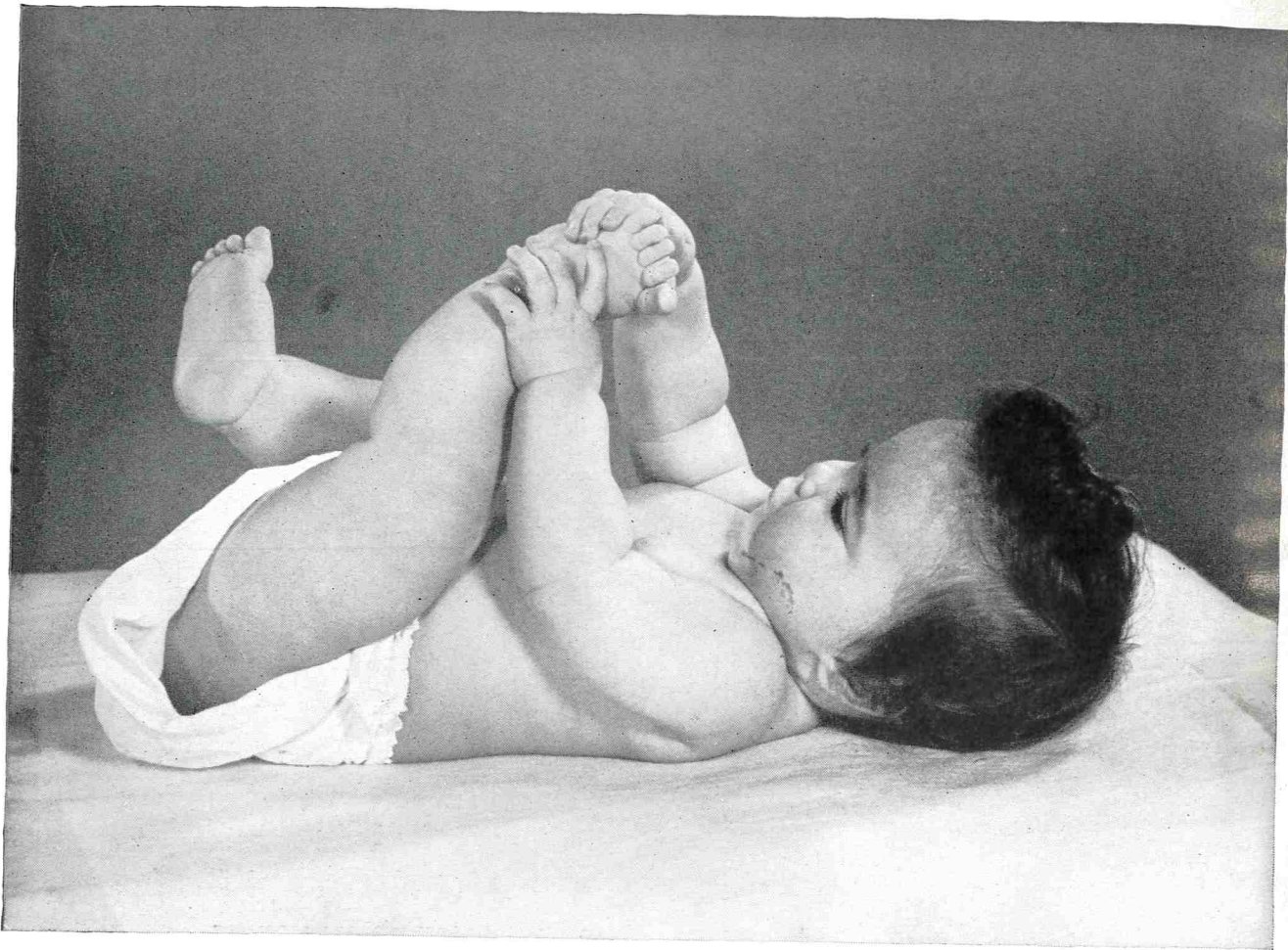
APRIL, 1955

Journal of

MILK and FOOD TECHNOLOGY

Official Publication

International Association of Milk and Food Sanitarians, Inc.



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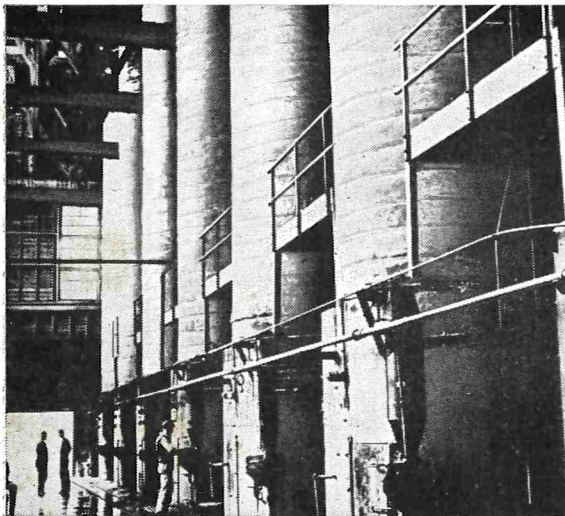
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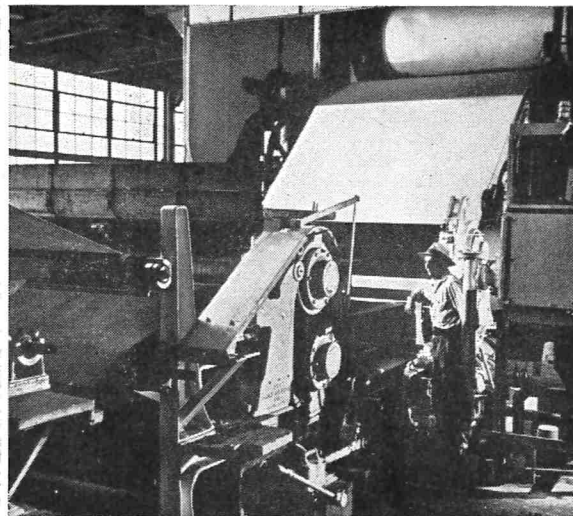
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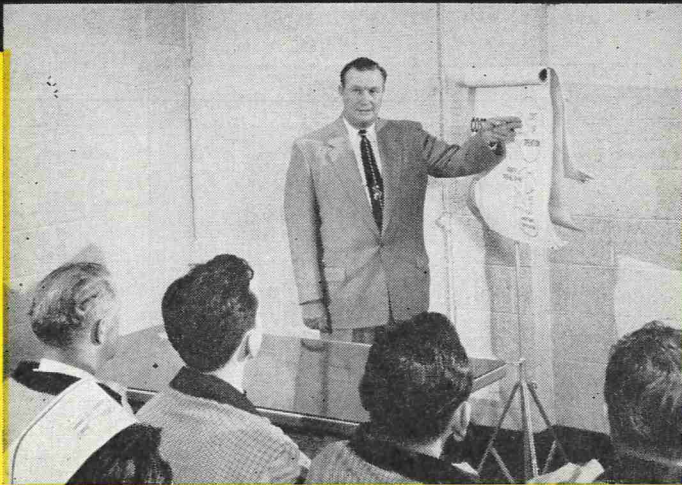
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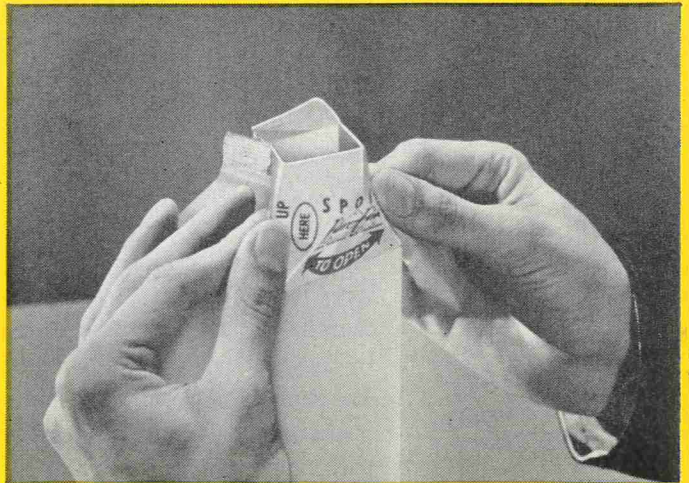
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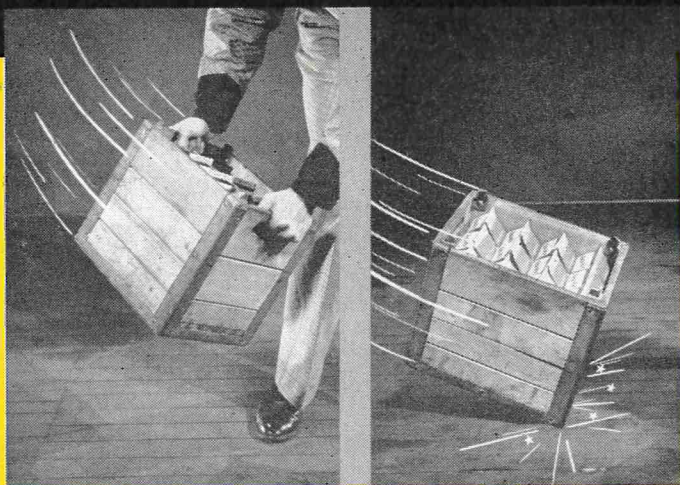
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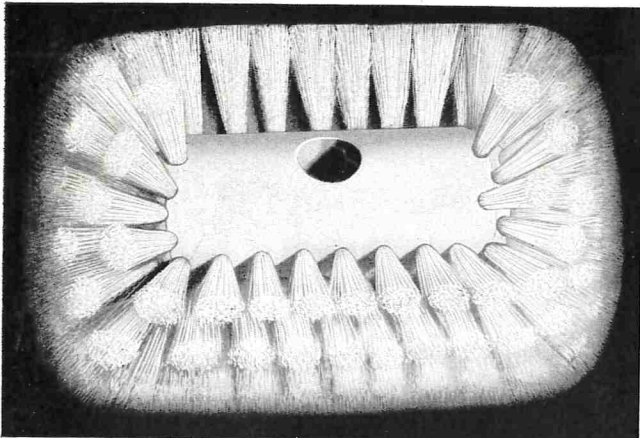
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The Journal of Milk and Food Technology (including Milk and Food Sanitation) is issued monthly beginning with January number. Each volume comprises 12 numbers. Published by the International Association of Milk and Food Sanitarians, Inc., with executive offices of the Association at Ritz Building, 12½ East Broadway, P. O. Box 437, Shelbyville, Ind.

Entered as second class matter at the Post Office at Shelbyville, Ind., March 1952, under the Act of March 3, 1879.

EDITORIAL OFFICES: J. C. Olson, Jr., Associate Editor, Dept. Dairy Husbandry, University of Minn., St. Paul, Minn.; H. L. Thomasson, Managing Editor, P. O. Box 437, Shelbyville, Ind.

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

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Subscription Rates: One volume per year
Individual non-members, Governmental and
Commercial Organization subscription,

1 yr. \$5.50
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Single Copies 1.00

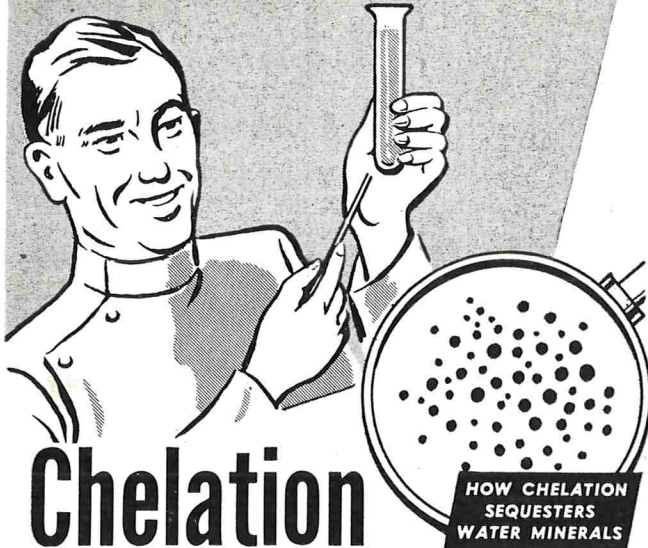
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Association, P. O. Box 437, Shelbyville, Ind.

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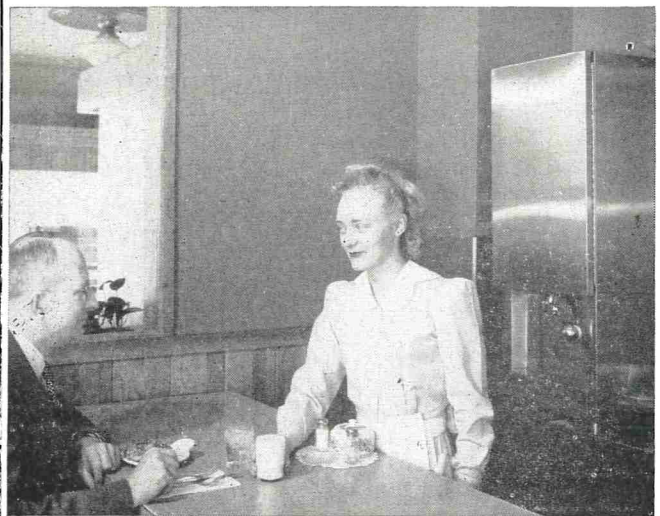
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Editorial Notes

PUBLIC ATTITUDE—PUBLIC RELATIONS

Many of the troubles that beset us originate in our minds. Much of our thinking is inspired by emotion. A lot of it is based on rather sketchy information. Impressions we gain greatly influence our actions.

Those of us who are associated with the milk business have some understanding of the immense amount of research that has explored many aspects of this huge enterprise. We know something of the forces that are at work to keep the price down. We know of the great network of pricing systems that has been devised to provide a fair price to farmers. We are part of a splendid system of quality control which was developed to provide the public with a highly palatable and wholesome food. Yet the average citizen, faced with his own personal problems and a variety of complex national and international issues has neither the time nor the inclination to become thoroughly acquainted with the milk business. As a result, public opinion relative to the dairy industry is primarily a matter of impressions.

The classic example of this occurred in Providence, Rhode Island four years ago. A newspaper in that city of 250,000 people published a series of articles that challenged the quality of milk sold in that area. The first article appeared under the major headlines that read, "SOME MILK IN PROVIDENCE UNFIT FOR HUMAN CONSUMPTION". The reaction was immediate and overwhelming. Some firms lost as much as one-half their business overnight. The important point, it seems to me, is the fact that in the space of 24 hours nothing in the milk business had changed except the attitude of the public. The milk was the same. The delivery service was the same. The containers were the same. The price was the same. Everything was the same except the attitude of the public, and that was enough to bring the fluid milk

industry in Rhode Island's first city to the brink of disaster.

There are other instances, many other instances, where an impression has been created that has had far reaching results. Price wars, strikes, misunderstood health and marketing regulations and new methods introduced unjudiciously have created situations in which impressions were gained that lead to difficult and, at times, dangerous situations.

I am not so naive as to believe that this problem can suddenly be eliminated. It does seem to me, however, that much more can be done to improve public relations of the dairy industry. One of the steps, in that direction, might be an industry-wide information agency. Today we have no central source to which people can turn for factual and current information on all phases of the dairy industry. Such an agency is needed. I do not know what form it should take nor how it should be financed but as time progresses the need for such an organization becomes more and more evident. In the meantime, a great responsibility for disseminating honest and accurate information must rest with the individual parts of the industry.

Also, it seems to me, that we must be careful of our own attitudes and of our own susceptibility to impressions. Because the industry that we serve occupies a position of such significance in our society, and because the things that we do have such a profound influence on the welfare of the nation, it behooves us to move with logic and reason. We have the task of overseeing the operation of a mighty industry. The effective discharge of that task is all important. It is a charge that will yield only to mature judgement based on sound information.

Norman Myrick

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Please, notice letter by H. L. Templeton, Chairman, Membership Committee, on page 116, please, fill out questionnaire (page VII) promptly and mail as directed.

FORTY-SECOND ANNUAL MEETING

HOTEL BON AIR — AUGUSTA, GEORGIA, OCTOBER 4 - 6, 1955

THE PROBLEM OF FALSE COLIFORM COUNTS ON FRUIT ICE CREAM¹

FRANKLIN W. BARBER AND HARVEY FRAM

National Dairy Research Laboratories, Inc., Oakdale, Long Island, N. Y.

A study of coliform tests on fruit ice cream has shown that there are organisms other than coliforms present in the ice cream which give positive test results. Investigations on the source, types, and reactions of the bacteria involved indicate a need for confirmed coliform tests and caution in the interpretation of coliform test results on fruit ice cream.

For many years investigators have been concerned with various aspects of the coliform problem and its significance in the examination of dairy products. More recently attention has been turned to the detection of coliform organisms in ice cream. Methods for the enumeration of coliforms in ice cream have been evaluated by a number of laboratories in a recent collaborative study and as a result these studies on the coliform problem in fruit ice cream were undertaken.

A survey of the literature and plant data indicated that in the testing of ice cream for coliform organisms, fruit ice cream frequently showed coliform counts in excess of 10 per gram. Numerous investigators have recognized that the ingredients added to ice cream—especially fruits, nuts, and flavors may be a source of coliform contamination. It has been suggested that it would be well to consider these materials in looking for the cause of high coliform counts. Another factor which should be considered in the evaluation of fruits to be added to ice cream is the possibility of a normal bacterial flora on the fruit.

Although the coliform counts on fruit ice cream might possibly be caused by contamination within the plant during processing, daily plant data indicated that this was not the case. Preliminary studies showed that there are organisms present in banana, peach, and strawberry ice cream which give false positive coliform tests. These observations prompted us to investigate the nor-

mal bacterial flora of fruits used in these ice creams and emphasized the fact that positive coliform tests on fruit ice cream must be interpreted with care.

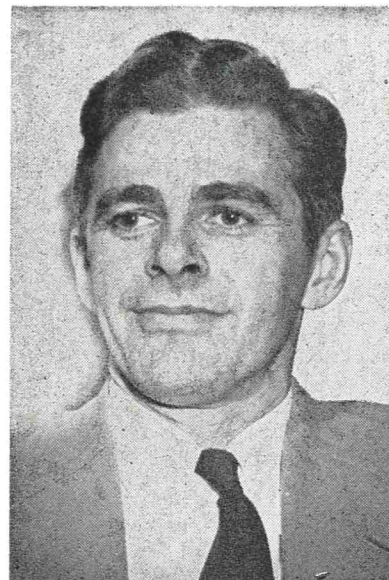
Discussions on the coliform problem with various investigators disclosed that despite the fact that Standard Methods for the Examination of Dairy Products clearly prescribes the procedures to be followed for the coliform test on frozen desserts, some laboratories both of the industry and of regulatory officials frequently relied only upon the solid media presumptive coliform tests. These studies show that confirmatory tests are essential if the reporting of false positive tests is to be avoided.

LABORATORY INVESTIGATIONS

Before discussing our laboratory investigations of the coliform problem it might be well to briefly describe the test as it was used in our study and, for the sake of clarity, define the coliform group. In all our studies samples were plated using desoxycholate lactose agar (DLA). Samples also were inoculated into brilliant green lactose bile broth (BGB) gas tubes. Colonies developing on DLA plates after incubation at 35° C. for 24 hours were picked into lactose broth gas tubes to confirm gas production from lactose after 48 hours at 35° C. Gram stains were usually made from the lactose broth tubes.

In these studies when we refer to "coliform organisms" we are using the definition given in the 10th Edition of Standard Methods for the Examination of Dairy Products. "The Coliform Group includes all aerobic and facultative anaerobic, Gram-negative, non-sporeforming bacteria which ferment lactose with gas formation. Bacteria of both fecal and non-fecal origin are members of the group. In addition to *Escherichia* and *Aerobacter* species, it includes a few lactose-fermenting species of other genera."

Early studies showed that both the fruit and plain mix could be



Dr. Franklin W. Barber has been connected with the Research Laboratories of National Dairy Products Corporation since 1945 and is now Senior Scientist in charge of the Fundamental Laboratory at the company's research headquarters, Oakdale, Long Island, New York. He is a graduate of Aurora College, Aurora, Illinois, and received his M. S. and Ph.D. degrees from the University of Wisconsin. He has been active in the field of dairy bacteriology since 1937, and has numerous publications in this field.

free of any coliform organisms but when these two ingredients were mixed together positive coliform reactions were obtained. Proper cleaning and sterilization of the fruit injector and the freezer did not eliminate the positive tests. It was reasoned that the small amount of ice cream solids carried over to the plate or tube when 1 ml. or 0.1 ml. of ice cream is tested might be sufficient to result in these false positive reactions. Further tests have shown that it apparently is the sucrose which is responsible for the development of large red colonies on the solid test media and the production of gas in the liquid test media. This reaction was observed when DLA, violet red bile agar or BGB were used as the test media.

It was observed that DLA plates of fruit puree contained small red or pink colonies. When these colonies were isolated and the cultures replated on DLA with added sucrose (1 per cent) or ice cream

¹Presented at the 41st Annual Meeting of the INTERNATIONAL ASSOCIATION OF MILK AND FOOD SANITARIANS, INC. at Atlantic City, New Jersey, October 21-23, 1954.

mix the colonies which developed were large and deep cherry-red in color indistinguishable from "true" coliform colonies, while on the regular DLA medium small to tiny pink colonies developed. True coliform organisms (those producing gas from lactose) did not change in size or color with the addition of sucrose or ice cream solids to the DLA medium.

SOURCE OF ORGANISMS

The bacteria involved in these false positive coliform reactions are for the most part Gram-negative rods although some Gram-positive cocci and a few yeast also have been encountered. All of the organisms are indistinguishable from true coliform bacteria in solid media tests and sometimes in liquid media tests in the presence of ice cream solids. Typical cultures of the Gram-negative organisms isolated have been studied in more detail in attempts to identify them. Identification is not complete but it has been proven conclusively that these organisms are not part of the coliform group.

A wide range of source samples have been investigated in these studies. Isolations have been made from our own as well as competitor fruit ice cream, commercially packed strawberries, peaches, and bananas, bananas purchased at local fruit stores, frozen and thawed fruit puree, fresh strawberries picked at the farm, berries as delivered at the fruit processing operations, and from experimental ice cream produced in our laboratory. At the present time over 218 cultures have been studied. The same types of organisms have been isolated from strawberries, peaches and bananas and apparently make up a large part of the normal bacterial flora of these fruits.

CULTURE STUDIES

As has been stated, it was observed that frequently the DLA plates of fruit samples showed large numbers of small red to pink colonies and that these colonies upon isolation and replating on DLA plus sucrose produced large typically red coliform-like colonies. A definite program of testing each isolant was desired to determine if the organism was one which might give a false positive coliform test in the presence of ice cream solids. Colonies were inoculated into

broth and replated and inoculated into DLA, DLA plus 1 per cent, sucrose, DLA plus 1 ml. of ice cream mix per plate, lactose broth, lactose broth plus 1 per cent sucrose and lactose broth plus 1 ml. of ice cream mix. From the growth in these media it was possible to classify these bacteria into several types.

Type A gave small pink colonies on DLA and large red colonies on DLA plus sucrose or ice cream mix, no gas from lactose but might or might not show gas in the presence of added sucrose or ice cream mix.

Type B gave small pink colonies on all media, no gas from lactose and might or might not show gas in the presence of added sucrose or ice cream mix.

Type C gave large red colonies on all media and produced gas from all liquid media—considered a typical "true coliform".

Type D gave large red colonies on all media but showed no gas from lactose and might or might not show gas in the presence of added sucrose or ice cream mix.

Type X gave no growth or very slow growth on DLA, medium red colonies on DLA plus sucrose or ice cream mix, no gas from lactose and might or might not show gas in the presence of added sucrose or ice cream mix.

It should be emphasized in reviewing the results to date that these studies although they may appear to be quite extensive, in reality are of an exploratory nature. In most cases, for example, actual counts were not made on various samples since we were interested only in the types of organisms present and were limited as to time and personnel available for the studies. However, these studies show the presence of organisms in fruit ice cream which give false positive coliform reactions. Their numbers, frequency of occurrence, the possibility of other organisms giving similar reactions, sources, the flora of other fruits—are all subjects which should be investigated further.

Realizing the limitations of the study, an examination of the data covering the various phases of the problem discloses a few interesting facts. Over 75 pint packages of

various flavors of ice cream were examined and 24 of these samples showed typical coliform colonies on DLA plates. In all, 73 colonies were isolated of which 45 were typed. Sixteen were Type A, 2 were Type B, 15 were Type X, 8 were yeast and only 4 were Type C or "true coliforms".

The fruit studies gave similar results. Over 300 samples of strawberries, peaches, and bananas were examined. In the strawberry studies of the 59 isolants typed, 21 were Type A, 6 were Type B, 1 was Type C, and 1 was Type D. The bananas examined resulted in 32 isolants which gave 15 Type A, 12 Type B, and 5 Type D. In the peach studies 90 isolations were made and showed 49 Type A, 5 Type B, 13 Type C, 13 Type X, and 10 yeast.

So far in our studies 218 isolants have been typed. All of these probably would have been counted as coliform colonies on DLA plates. Actually only 20 were organisms which can ferment lactose and hence could be classed as "true coliform" bacteria.

It is of interest to note that other investigators have now reported similar false positive coliform reactions. One large Eastern ice cream company recently told us that from 20 to 40 percent of all the positive coliform plates of all ice cream samples were found to be false positive tests. In this study all the colonies developing on a DLA plate were picked into a single tube of lactose broth. Although one colony would cause this mixed culture to show gas, this method has shown the presence of false positive colonies.

Another company reports a study in which they picked 42 colonies from 7 ice cream samples (strawberry brick and Neopolitan brick). Seventeen of these colonies were found to be false positive types. These results have been confirmed by a midwest health department. A comment of interest regarding the colonies developing on DLA plates is the following: "Many of these organisms do not appear to be dark red, and often have a slight ring around them. However, the health departments were reading anything of coliform nature."

The point we wish to emphasize as a result of these preliminary studies is the fact that great care

must be taken in the interpretation of coliform results on fruit ice cream especially when the solid media presumptive tests are the only coliform tests made on the ice cream. We recommend that Standard Methods for the Examination of Dairy Products be followed carefully in the examination of frozen desserts as it is essential that

confirmed tests be made to avoid the reporting of false positive coliform results.

In conclusion we realize that these studies are by no means complete and our own investigations are continuing. There are many aspects of the problem yet to be investigated such as a quick short method for the differentiation between true and false coliforms,

identification of the false positive types, studies on their heat resistance, the effect of freezing and thawing, survival in frozen puree and in ice cream, and the normal flora of other fruits. Eventually the answer will be forthcoming, but the future certainly requires further research on this problem of false positive coliform tests in fruit ice cream.

MOLD CONTROL IN BAKERIES¹

WENDELL REEDER

Campbell Taggart Research Corporation, Dallas, Texas

The spoilage of bread and other foods by mold growth is a constant problem causing food losses both in homes and in industry. Spoilage due to molds occurs because large numbers of mold spores are widely distributed.

Molds growing on bakery products generally are not pathogenic nor are they poisonous to man; however, the bakery customer will be quick to reject any baked product which has visible mold upon it or which may become moldy too soon after purchase.

Some molds are valuable and necessary for processing such important commodities as cheese, malt supplements for brewing and bread making, and for the production of famous anti-biotic "miracle" drugs.

Molds belong to the Sub-phylum of the Plant Kingdom called *Fungi*. The *Fungi* may be further subdivided into six Classes. Most of the molds of economic importance are members of three of the six Classes.

These three Classes are:

1. *Ascomycetes*. This Class includes yeasts, ergot producing parasites, and those molds which form spores within a membrane sac called an ascus.

2. *Fungi Imperfecti*. This Class includes such common genera of molds as *Aspergillus*, *Penicillium*, *Monilia*, and others.

3. *Phycomycetes*. This Class includes common genera of molds such as *Rhizopus* and *Mucor* which

cause spoilage of fruits, bread and other foods.

Mold species commonly encountered in bakeries belong to the genera *Rhizopus*, *Mucor*, *Aspergillus*, and *Penicillium*. The spores of these molds are commonly present in the air, especially if the air is dusty, since most molds readily grow in soil. Damp or wet areas surrounding a bakery or within a bakery usually have mold growth associated with them, and the spores of these molds are directly inoculated into the air especially during the summer months when temperatures are more favorable for mold growth.

The names and classification of molds are not nearly as important to the baker as methods of mold control. Regardless of the kind of mold found, the problems and methods of control are the same as for all living organisms. The conditions of moisture, temperature, pH, and food supply are the important and basic principles on which mold growth or control of their growth are based.

Molds do not grow without a source of moisture. If the moisture content of a food or a surface on which molds might grow is reduced to less than 15 per cent, the molds do not thrive; thus, dehydration may be used to preserve foods and, also, to prevent the growth of molds in such areas as bakery proof boxes or fermentation rooms. However, it is not practicable to dry bread or cake to control molds because drying will reduce the palatability of the products to such a degree that they could not be sold. On the other hand, frequent drying out of the proof box or fermenta-

tion room will help control mold growth on the wall surfaces.

In the control of mold growth in bakeries, it is important to eliminate moisture on the cold water and refrigeration lines, especially those on the cooling units of the wrapping machines. (Mold growth is commonly found on such surfaces.) This should be done by use of proper insulation material. The careful handling and maintenance of pan washing equipment and of garbage containers, and proper maintenance of plumbing, including floor drains to keep water in its proper place, are important in the control of molds.

Because proper temperature conditions are necessary for mold growth, this principle also may be used for its control; for example, freezing or sterilization by heat. During baking of bakery products, temperatures are reached which effectively kill all mold mycelia and mold spores which may have contacted the dough.

Molds grow best at temperatures of 80° to 100° F., but they may grow at temperatures as low as 60° or as high as 120° F. In some bakeries, it is possible to raise the temperature of the proofing room

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Dr. Reeder has been a member of the staff of Campbell Taggart Research Corporation since 1941, and in 1945 was made Director of Research, the position he now holds.

¹Fourth of the series of papers on Bakery Sanitation presented at the Arizona Bakery Sanitation Seminar, sponsored by the Phoenix Health Department, Phoenix, Arizona, October 6, 1954.

or fermentation room sufficiently with hot dry air to kill all active molds. This requires a temperature near 160° F. for 10 minutes.

Another aspect of mold control in a bakery is that of controlling mold contamination of bakery products after the products leave the oven and before they are wrapped. If bread or other bakery products could be taken from the oven and immediately wrapped and sealed in clean sterilized containers, molds would not develop because inoculation with mold spores would not likely occur. Unfortunately, this is not possible because bakery products must be cooled before proper slicing and wrapping can be completed.

The degree of acidity or alkalinity (pH) is important to mold growth because molds grow best at a pH range of 4.5 to 6, however, they may grow within the range of pH 3 to 9. Bread having a normal pH of 5.2 is well within a favorable pH range for mold growth. The pickling of foods such as cucumbers and meat is an example of a process which results in reducing the pH of a food product to a range within which molds do not grow readily. In some areas of the bakery, such as floor drains, garbage disposal areas, pan washing areas and shower stalls, the principle of "pH control" may be used in treating these areas with dilute caustic or alkaline cleaners. This will raise the pH above that tolerated by the molds. It is not practicable, however, to change the pH of bread to control mold growth. However, the use of vinegar (acetic acid) has been used with some success. Although there is good reason to believe that any inhibition of mold growth which might occur may be due to effects other than that of low pH.

If it were possible to remove all sources of food for molds from the bakery, there could be no mold growth. However, this is not practicable, but the principle may be used successfully for good mold control. This principle is effective housekeeping or in other words strict sanitation, whereby materials which molds may use for food are

removed from all surfaces often enough to prevent the accumulation of molds. It is extremely important to remove all dough and ingredients from the make-up machinery of the bakery at regular intervals and from every crevice and surface. This will assist in controlling insect infestation as well.

One of the most important factors in controlling the growth of molds in bakery products is the prevention of contamination of such products by mold spores. This is especially necessary in the cooling and wrapping areas after the bakery products are taken from the oven. Prevention of mold inoculation of the products requires strict sanitary conditions at all times. Cooling racks, conveyors and any surfaces which may contact the baked product must be clean. Cooling of bakery products should be done in a dust free, clean room and fans used for cooling these products must be clean. The cooling air should be free from dust and mold spores. Careful placing of the fans to be certain the incoming air is drawn only from the cleanest possible areas will greatly reduce the inoculation of bakery products.

Operators of slicing and wrapping equipment should be the cleanest personnel and should possess the best hygienic habits of all bakery employees. Needless to say, the wrapping and slicing equipment must be kept clean and sanitary. The refrigeration units and lines of the wrapping machine should be well insulated and kept clean and free from mold growth.

Too often proper storage and handling of paper, cellophane, trays and other wrapping supplies is neglected. All of these materials should be treated and kept as sanitary as possible. Wrapping supplies should be well protected from dust at all times and must be kept off the bakery floor even while changing rolls of paper on the wrapping machines.

Sweeping bakery floors is certainly necessary during slicing, cooling, and wrapping of bakery products; however, this should be

done with the minimum of dust-raising since any drafts carrying dust to the products also will carry mold spores. Vacuum cleaning should replace ordinary sweeping methods in this area.

In addition to the control of molds by low moisture, high or low temperatures, pH, and cleanliness, inhibitors of mold growth such as sodium or calcium propionate or sodium diacetate may be added directly as ingredients. These are not fungicides but serve only to inhibit or retard the growth of molds. Therefore, they cannot be relied upon to keep bakery products mold-free indefinitely.

Certain non-toxic disinfectants may be applied to the walls or floors of the bakery to destroy and inhibit mold growth. Careful selection of such materials is essential and no poisonous materials should be used.

Mold inhibiting paints also are available for walls and ceilings for proof boxes, fermentation rooms or other areas. Although they are not completely fungicidal, certain non-toxic paints containing quinolinolates may be valuable aids in inhibiting mold growth. Ultra-violet lamps have a very limited application to the control of molds in bakeries. The destruction of molds in bakery products by radiation may become highly important in the future, but as yet, this method is not in general use.

Since the baker cannot, for practicable reasons, change the moisture content, the pH or the storage temperature of his product, his problem of mold control is essentially directed at preventing the inoculation of bakery products from the time they leave the oven until they are wrapped in clean sanitary sealed packages. The prevention of mold growth thus requires careful engineering and expert sanitary care not only of areas where mold might grow, but also the entire area where the products are processed after baking. In doing this, he must rely mainly on the principles of moisture control, temperature control, pH control, strict sanitation, and the use of inhibitors of mold growth.

THE NEED FOR SALESMANSHIP INSTEAD OF POLICEMANSHIP¹

ERNEST B. KELLOGG

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The topic which I shall discuss is one that, in my opinion, is fundamental to our way of life—what we like to think of as our American way. There are people representing many viewpoints and many occupations who claim that it is their group that made America great; but an excellent case can be made for the salesman, taken in its broadest sense.

Lee McCanne, Vice President and General Manager of Stromberg Carlson said, "The importance of the salesman as an educator has scarcely been appreciated. What made America Great? Was it the possession of raw materials? Was it our great development of the use of machinery in mass production and our resultant high standard of living? These things could never have developed if salesmen had not continuously created public demand and expanded the markets for our products by forever showing people something better."

But, you may say, "What has that to do with the milk inspector? I have only to see that a farmer lives up to the ordinance or I will shut him off. There will be plenty of others anxious to take his place."

Unfortunately, this has been the attitude of far too many of our inspectors. It is an attitude that creates resentment instead of cooperation. Let's look for a moment at this question of attitude. Lee McCanne said it was salesmanship that educated us to a better way. He could also have pointed out that in America we have free choices: to buy or not to buy, to buy this brand or that brand. We may be urged, but our patronage is appreciated. Compare this with a country that also is blessed with great diversified areas and mineral resources, but that suffers under a heavily depressed living standard. Russians have never enjoyed freedom of choice. Communist police

were substituted for Czarist police; the common man has not made that nation great, in our sense.

The salesman is typical of democracy in contrast with the policeman of dictatorship.

The salesman lives by making friends — the policeman normally makes enemies.

The salesman must justify his viewpoint—the policeman enforces; he can even require the ridiculous.

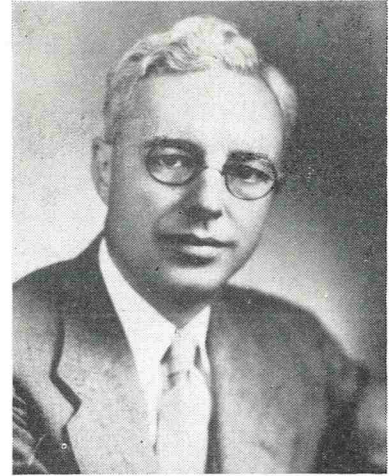
The salesman develops a pride of accomplishment or a pride of ownership—the policeman creates a resentment that makes one satisfied with just getting by.

The American has been raised in an environment of being sold, and resents being told.

I would like to discuss a few of the principles of the salesman that may be applied to your job of assuring high quality milk supplies. First, we must remember emphatically that the salesman's logic must be sound. This is basic. The policeman can enforce the ridiculous, but the salesman cannot sell the ridiculous, at least not to an intelligent person. All of us will admit that many ordinances contain requirements that just do not prove to be necessary. I urge you to look at your own, and then ask yourself the question: Do I want Grade A farms, or do I want Grade A milk? The city consumer, your boss, is mostly interested in Grade A milk.

So let's not pester the farmer about non-essentials if the record of the milk he delivers at the platform is good. Let's work with the producer who is having trouble, and, by use of the laboratory results, show him the cause on his farm for his troubles.

Leonard T. Thomasma, Assistant General Sales Manager of the Todd Company said, "The basic problem in selling is to change the prospect's mental attitude from indifference or opposition, to eagerness or willingness to buy." Is that so very different from your job? To paraphrase this statement: "The



Born on a cattle ranch in Western Kansas, Ernest B. Kellogg spent his boyhood in Washington, D. C., Wausau, Wisconsin, Chicago and New York. He studied agriculture at the University of Wisconsin. Following a year of graduate work, he was employed by an advertising agency in Chicago, and later by the National Lumber Manufacturers Association in New York. In 1929, he became Assistant Secretary of the International Association of Milk Dealers in Chicago. At the time the International merged with the Milk Industry Foundation in 1947, he was made Secretary of the new organization and moved to Washington. Besides his duties as Secretary, Mr. Kellogg is Convention Manager of the Milk Industry Foundation, staff representative of the Accident Prevention Committee of the Foundation, and a counselor to the Executive Committee of the Motor Vehicle Section of the National Safety Council. As a hobby, Mr. Kellogg owns a dairy farm in northwestern South Carolina where he is trying to prove that a family size farm can be profitable based on maximum utilization of pastures, and that a farm can produce good quality milk with a minimum investment in equipment and expenditure of labor.

basic problem of the Sanitarian is to change the farmer's mental attitude from indifference or opposition to eagerness or willingness to produce the cleanest, purest milk, 12 months of the year."

It is the salesman's approach that is required. In this regard Dale Carnegie said, "There is only one way under high heaven to get anybody to do anything. Yes, just one way. And that is to make a person *want* to do it. Remember, there is no other way."

¹Presented at the 41st Annual Meeting of the INTERNATIONAL ASSOCIATION OF MILK AND FOOD SANITARIANS, INC. at Atlantic City, New Jersey, October 21-23, 1954.

Sure, you can inspect, threaten and fine a farmer into keeping a majority of his counts below 100,000 to 200,000. But if he *wants* to do it, he will have the majority below 10,000. And you can sell him that *want*. You can sell it through his other wants. The most important secret of salesmanship is to find out what the other fellow wants, then help him find the best way to get it.

I daresay that in many respects, the farmer reacts to authority in ways similar to the laboring man. Careful studies have been made of labor's *real* wants. One such study, reported by Middlewest Service Co., rated in order of importance 11 things men value in their jobs. The pay scale was seventh in the list! At the top of the list was "Interesting Work", second was "Job security", and third was "Interest the company takes in the individual worker".

The farmer's wants are different in some respects, but a careful study would show his *real* wants to be different than what we usually suppose. A farmer wants, to name only a few things:

1. Recognition. He, like ourselves, has pride. He likes occasionally to be told when his work is good.

2. A comfortable standard of living. He is willing to work for it; frequently he is better at physical work than mental, but he does like his milk check.

3. Friendship. He will respond to a helpful attitude.

4. Shorter hours. He is not asking for an 8-hour day, or a 40-hour week, but he is no longer interested in a 16-hour day.

So our first principle of selling quality is to *help* the farmer to satisfy his wants.

We do not help a farmer by visiting his milk house, checking off a score card, and disappearing. We help him by discussing and showing. This can be done without arguing. Benjamin Franklin has a lesson for us on this point. In his autobiography, he confesses that, when young, he made enemies because he argued—made too many positive statements and tried to dominate people. Later he discovered the Socratic method of persuasion.

Listen to this delightful bit from

Franklin, keeping in mind some of our milk house interviews:

"When another asserted something that I thought in error, I deny'd myself the pleasure of contradicting him abruptly, and of showing immediately some absurdity in his propositions; and in answering I began by observing that in certain cases or circumstances his opinion would be right, but in the present case there appear'd or seem'd to me some differences, etc. I soon found the advantage of this change in my manner; the conversation I engaged in went on more pleasantly. The modest way in which I propos'd my opinions procur'd them a readier reception and less contradiction; I had less mortification when I was found to be in the wrong and I more easily prevailed with others to give up their mistakes and join with me when I happened to be in the right."

Our terminology may have changed since Franklin's day, but we note that human nature had not changed from Socrates' time to Franklin's—a stretch of 2100 years. I daresay it has not changed much in the additional 200 years.

Frank Bettger is considered one of today's top salesmen. Prentice-Hall, Inc. published a book of his on selling that in one year has been through eight printings. Dartnell Corp. of Chicago has a movie on his methods especially for salesmen. Frank Bettger says the most important word in the English language has only three letters. The word is WHY. Bettger sells insurance. In his book, he quotes one of his customers:

"I don't know whether you realized what you were doing, Frank, but the first time you called on me, I told you that I was going to tell you the same thing I told every other insurance salesman who came to see me: 'I don't believe in life insurance.' Instead of launching into a long argument, like other salesmen did, you encouraged me to keep on by repeating, 'Why, Mr. Walker?' The more I talked, the more I realized that I was on the wrong side of the argument. Finally I convinced myself that I was wrong. You didn't sell me. I sold myself. But I never knew just how

it happened until that night I talked too much down at Skyland. Now, Frank, the point of the story is this: Since I got back, I've sat in my office and sold more lumber, right over the telephone, than I ever sold before, just by asking 'Why?' So I wanted to let you know in case you didn't already know how you sold me my first policy."

Bettger expressed amazement that so many salesmen are afraid to use this technic. Perhaps he would be equally amazed at the approach of sanitarians. He cites case after case where this method has worked.

A valuable point in this technic is to find the hidden objection. J. P. Morgan once said, "A man generally has *two reasons* for doing a thing: one that *sounds* good, and a *real* one."

Bettger said, "The best formula I ever found to draw out the *real* one is built around two little questions: 'Why?' and 'In addition to that . . . ?'"

The second principle of selling for the sanitarian, then, might be: Ask "Why", to accomplish two things, (1) Help the farmer convince himself, and (2) Find the *real* reason for his objections.

A third selling principle, emphasized by many writers, is to be a good listener. If you use the "why" method, you must listen. But listen as though you are sincerely interested in what the other man is saying. Give him all the eager attention and appreciation everyone craves—is hungry for.

To be a successful selling Sanitarian, you must create confidence in *you*. The most influential way to make others have confidence in you is to believe every statement you make. George Matthew Adams said,

"The wisest and best salesman is always the one who bluntly tells the truth about his article. He looks his prospective customer in the eye and tells his story. That is always impressive. And if he does not sell the first time, he leaves a trail of trust behind. A customer, as a rule, cannot be fooled a second time by some shady or clever talk that does not square with the truth. Not the best talker wins the sale—but the most honest talker . . . there is something in the look of the eye, the arrangement of words, the spirit of a salesman that immediate-

ly compels trust or distrust . . . being bluntly honest is always safe and best."

Parenthetically, to follow this strictly may be a little embarrassing in connection with some clauses of some ordinances. I suggest that in your selling you emphasize those points that are *really* necessary for the production of top-quality milk.

Ranking with belief in your statements is the importance of knowing your business, and continuing to know your business. Presumably you are here today for just that purpose — to keep in touch with progress. Our farm inspectors who are out in the country need to know their business thoroughly. A farmer soon knows which visitors are blindly following the book.

I have resisted the temptation to fill this paper with quotations of dairy farmers' gripes that appear in Hoard's Dairyman. I have a collection of several dozen. If any one of you does not read Hoard's regularly, you should by all means do so, because it gives you an insight into the problems and viewpoints of dairy farmers—your customers, if I may so speak. The cost is only two dollars for three years. One quote at this point will illustrate several points. A farmer writes:

"My cow barn is sealed with tongue-and-groove lumber, smooth and painted. Here and there—I'll confess—some of the paint now has disappeared or it is a little thinner than I'd like. An inspector told me it should be repainted. Now the reason that paint is worn is because the interior of my barn is washed and scrubbed with soap and water, disinfectant added. If I hadn't washed and scrubbed it, the paint would still be there. But the washing and scrubbing meant nothing to that inspector. Only thing that mattered to him was that the paint was thin in spots. I might have asked him which was the most sanitary—a barn with thin paint that had been washed and scrubbed, or a barn with thick paint that hadn't been. I thought of asking, but it would have been foolish of me, and so I didn't. You never win an argument with an inspector. And anyway I'm not as tactful myself as I used to be and you never

know what sort of mayhem a question like that might lead to, me being as short-tempered as I sometimes get."

If the barn was as reported, here certainly was an inspector who was blindly following the book. It is evident that this farmer had little confidence in him. In any event, the inspector had not *sold* this farmer.

That quotation leads into the last principle of salesmanship I will discuss this morning: Make people *want* to do business with you.

"If you would win a man to your cause," said Abraham Lincoln, "first convince him that you are his sincere friend." Note that Lincoln was not here giving advice to salesmen. He said, to "win a man to *your cause* . . ." What greater cause is there for the milk sanitarian than to help to build a group of farmers who are willingly producing the best milk for the health of our city citizens who are your city employers. To do this, you must be the *friend* of these farmers. I know of one market where the inspectors head their cars out toward the road when they park in the farmer's drive. They are ready to get out in a hurry—if necessary for personal safety.

A sanitarian has a harder job in being a good salesman than the usual salesman has; for he can take the lazy way by falling back on the law. He has no competition from other salesmen for the customers' patronage. But this business of getting prepared in advance to run from the clients is going a bit far toward developing dictatorship methods in our democracy.

Make people *want* to do business with you.

Without getting involved in a psychological discourse, let's consider a few of the things that may help to make farmers *glad* to see you turn into their driveways:

1. Your greeting. How about a cheerful smile? Smiles and cheerfulness come more easily to one who is not over-impressed with the authority he carries around with him. With practice, a friendly smile can become natural. "Action seems to follow feeling," said William James, "but really action and feeling go together; and by regulating the action, which is under the more direct control of the will, we can indirectly regulate the feeling, which

is not." Thus, with practice, our smiles will in time come naturally.

2. Encouragement. How often have you added a note of congratulation to a low-count score mailed to a farmer? How often have you discussed the *good* points of his record of platform tests, or congratulated him on a clean barn? Are you a salesman or a policeman?

3. Genuine interest. Are you interested, and do you show it, in each farmer's progress with his cows, crops, equipment? If your memory is as poor as mine, you can easily help it by noting these things in a card file and reviewing a farmer's card before each visit. The same kind of points apply to his family.

4. Ability to aid. I have heard many business men say that they will always manage to see certain salesmen among those who call on them. These salesmen make themselves useful through the many new ideas they carry from place to place. The ideas may be totally unrelated to the product they sell, but they may be valuable to their customers. What opportunities the observant sanitarians have to do likewise!

It is not hard to make people *want* to do business with you.

"Selling is the sparkplug of the economy." The tools of the best salesmen deserve the careful study of all sanitarians. Numerous books are available for your asking. I look forward to the day when our health officers and their staffs will be so imbued with the American spirit that they will look upon their sanitarians as their sales force. This makes the health officer the sales manager. The successful sales manager is not so much a boss as a leader—a stimulator of men. He has many tools in his kit. One of these is the sales contest.

Have you ever tried a contest among your selling sanitarians? At the Los Angeles County Fair each year, awards are made in the "Dairy Inspectors Class". Why not have a contest in your own jurisdiction? It can be simple. Make an award to the sanitarian whose producers deliver to their plants the highest average quality milk for a year or for a summer period. If a few health departments would like to try this idea, the Milk Industry

Continued on Page 105

THE WORTH AND DOMAIN OF APPLIED SANITARY SCIENCE —A RATIONALE AND A PLEA¹

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It is no friendly environment, this of thine — Carlyle

Great strides have been made in the control of many adverse factors of the environment since the turn of the century. However, the solution of all environmental problems facing us is far from being realized. Considered at first as an applied bacteriologic science the meaning of environmental sanitation has been gradually broadened to include most, if not all, of the many aspects of human environment, disease provoking or not. Changing perspectives now imply not only the disease aspects and the promotion of health but other environmental factors not concerned with pathogenic microorganisms. A healthful environment now connotes not only physiologic, but psychologic, economic and sociologic values.

The modern environmental spectrum, if we may borrow from the terminology of the physicist, is comprised of a large number of factors grouped under the general fundamentals — air, water, food and shelter. More specifically, we have such man-made hazards as air and stream pollution, home, traffic and industrial accidents, harmful food additives and deficiencies, noise, radiological and other wastes, the not too remote possibility of biological, chemical and radiological warfare and such natural environmental hazards as allergies from air-borne spores and pollen, toxic aquatic growths and direct and indirect insect and rodent contacts. Aesthetics and nutrition are other important factors.

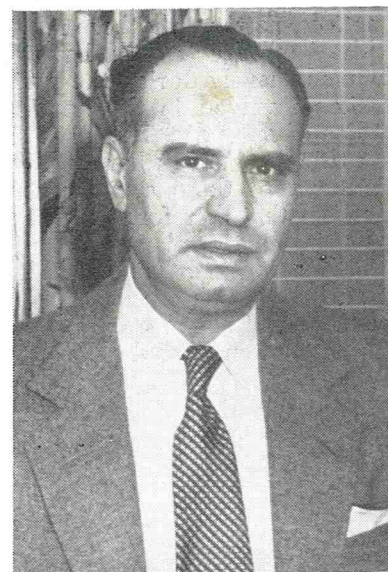
A forceful idea of the importance of environmental health is afforded by Bosch(1) who states that an estimated one-fifth of all the deaths in the world are due to adverse environmental conditions. Vaughan(2) believes that "Insanitation has registered more damage than enemy's bullets in many wars and atomic war may be no exception". The importance of proper sanitation

to the armed forces, learned by bitter experience, is reflected in its mandatory practice by all commands and the conductance of incessant research programs.

Recently a number of criticisms have been directed at certain environmental practices which should not go unanswered. Furthermore, whether we like to acknowledge it or not some segments of the public health team nurse various grievances, real or imaginary, which are not conducive to effective teamwork and should be considered. This discussion represents a constructive attempt to rationalize the subject of sanitary science in its manifold aspects.

CRITICISMS OF APPLIED SANITARY SCIENCE

Let us consider these arguments first from the standpoint of infectious disease remembering that the sincerity behind these criticisms is not questioned. The criticisms listed and discussed under this heading are voiced by Korns(3) and reflect the thinking of many medical men and surprisingly even some persons directly concerned with environmental health activities. These include, among others of perhaps minor importance, such assertions as these. The upsurge, real or apparent, in virus diseases can be laid directly at the door of applied sanitary science; for example, the present position of poliomyelitis, which is occurring more frequently today than in the past. The theory is that these changes are due to concurrent improvement on sanitary environment which prevents the acquisition of infection at an early age when the disease may be completely inapparent. Even assuming this is true, and the evidence is indirect, Korns answers this criticism very well. He states that the dropping of sanitary barriers is not necessary but rather that an effective poliomyelitis vaccine (advances are being made in this direction) be developed to immunize the population in a more scientific manner without the necessity of resorting to the sanitary



Mr. Milone was graduated from Cornell University in 1929 and in 1951 he received the M.S. degree from the same institution. He served in the Armed Forces during World War II and was associated with certain phases of the biological warfare project.

Mr. Milone is a life member of the New York State Association of Milk Sanitarians and is a member of several other scientific and professional societies. In his present position as Resident Lecturer, School of Public Health, University of Michigan, Mr. Milone is engaged in teaching and research.

practices of the Middle Ages. This trend in thinking may well be applied to other instances of this kind.

Another criticism, probably legitimate in part, is that the role of restaurant utensils with reference to prevention of disease has not been satisfactorily explored. Consequently, control through proper sanitization of utensils in restaurants is unnecessary. Perhaps the reason for the inconclusive evidence and paucity of information is that the restaurant environment is not amenable to controlled study. Reason, though not infallible, tells us that improper sanitary practices, including improper sanitization of utensils are doorways to danger. Until proven otherwise, let us take the precautions logic tells us to observe. This position is strength-

¹Presented at the 41st Annual Meeting of the INTERNATIONAL ASSOCIATION OF MILK AND FOOD SANITARIANS, INC. at Atlantic City, New Jersey, October 21-23, 1954.

ened by the unaesthetic aspects of improper sanitation.

SANITIZATION

Another premise is that one would suppose that environmental practices, particularly those related to the handling of milk, have not changed sharply during the period of time involved in the apparent decline of some diseases. It is said that this decline can hardly be attributable to these sanitary practices and that therefore there is no sense in continued concentration on milk sanitation. One should look sensibly at such occurrences as desirable and not meaning that all barriers thrown around milk should be let down.

The view that the control of rodents is desirable only from an economic standpoint is questionable. The potential of the rat as relates to infectious disease is attested to by the numerous researches and experiences in this field. Again the aesthetic aspects also frown on a discipline inclined to get rid of rodents only for economic reasons. Rodent hairs and excreta in food are hardly conducive to its enjoyment. Let us face it. Some rodents and some insects are not compatible with man for more reasons than one.

A somewhat amazing viewpoint is that the decline in some localities in typhoid carriers will eventually result in decline of the hazard of acquiring typhoid even from water, milk, and food contaminated with fecal material. Such an attitude assumes that people will not object to using food known to be contaminated with fecal material even though innocuous. The possibility of such fecal material carrying other kinds of intestinal pathogens can hardly be ignored. It may be wise to point out that the changing perspective in environmental health indicates the advisability of the application of services not only to the food environment but to the food as well. The importance of food to mankind makes it deserve cabinet ranking in any form of government.

In some diseases preventive measures are scorned since antibiotics can rob these diseases of their death sting. This may be a temporary state of affairs when the buildup of resistance to antibiotics of some pathogens is considered.

Besides, what about the patient's discomfort, loss of time, expense and hazard to others?

It is stated that, in general, control procedures leading to the prevention of naturally acquired immunity in the young are undesirable. Shall we keep a disease endemic purely to assure immunity in early childhood? One wonders if it would not be better to concentrate on the development of immunizing procedures, when the desirability is indicated, so that immunity would not be left to chance. Under natural conditions, with some diseases, immunity is of short duration, if any is conferred at all.

The shifting equilibrium between host and parasite induced through the medium of natural events or the practice of sanitary science can be turned to human advantage by learning all we can concerning the modes of transmission and by applying measures where they will do the most good even though some compromise in accepting lesser evils is dictated.

Burnet (4) observes that "The opportunities for the spread of droplet infection have in all probability been increased because of the greater size and mobility of modern city populations . . . and that . . . the extent of speed and travel between civilized countries has resulted in a more or less single closed environment in the biological sense". The decline of some diseases in some localities because of either natural causes or control measures should not lead to complacency and the dropping of barriers to these diseases. The potential threat of biological warfare alone should increase the pace of research in applied sanitary science.

Another unfavorable reaction to applied sanitary science is that the "shot-gun" approach should be avoided in favor of a more "pin-point" control directed at specific vulnerable points. Experience tells us that either approach may be wrong depending upon the character of the problem. Sometimes the former approach will realize cumulative benefits not shown by the latter and if so the shot-gun approach is the method of choice. Critics of "shot-gun" methods in sanitary procedures are in favor

of, or go along with, the "shot-gun" application of antibiotics. It must be remembered that in many situations we cannot postpone action until all the scientific answers are available.

All these considerations lead to the asking of some questions. Shall we accept death and disease based on partial or non-intervention because of death and disease in some unforeseeable future? Instinctively man tries to protect himself albeit from a bullet, a disease or a fall. He seeks shelter from the cold, the heat, the rain or the brightness of the sun. He gives a wide berth to a home quarantined by disease. He may be allergic to pollen. He dreads the coming of winter and does something about it if he can. He may get indigestion from poor quality food or drink and swears he will report nuisances to the health officer. Irritations attributable to environmental stimulants leave him with an unhealthy sense of frustration. The odor of unwashed bodies in enclosed spaces irritates his sense of smell. Loud irritable noises give him the will to mayhem. And the name of all these effects is environment! Successful control of environmental hazards and annoyances leading to complete or partial compatibility between man and his environment may alleviate, minimize or eliminate a large portion of the ills that man is heir to. Perhaps, all things considered, sanitary science does not properly belong to the medical sciences at all since much more is at stake than the modern medical concept of health.

THE POLICY OF LAISSEZ FAIRE

One of the major premises of the proponents of the *laissez faire* (leave well enough alone) policy is the assumption that absolute control of all harmful organisms can be readily achieved. Even if the habits, identity, sources and modes of transmission of all harmful organisms are known, absolute elimination is another matter. True, typhoid can be controlled, water rendered innocuous, milk safeguarded and food protected, completeness of control predicated on the effort, time and money expended. But the safety

achieved here is relative based on such factors as the human equation, the law of diminishing returns, the fallability of machinery and controls and the practicability involved. Of paramount importance is the fact that many processes permit the use of closed systems assuring a maximum degree of control as in the chlorination of water, pasteurization of milk and the like. Proper methods of storage and transportation also allow a reasonable degree of control. But closed-system conditions are not realized in all of the possible environmental patterns. We should also not lose sight of the contamination potential even under closed-system conditions after the process has been completed. So we conclude that in most approaches only relative safety is achieved while in others even this appears to be out of reach, at least at present. To realize the difficulties involved let us look at the various routes or pathways to infection. Thus we have the food and water-borne route, contact, airborne, vector and even an endogenous route where infection depends heavily on predisposing causes in the host. Modes of transmission determine the resultant pattern of infectivity and the more we know regarding these avenues the better able we will be to establish control measures designed to give *proper balance* to the control.

In many instances we have to take a calculated risk based on the principle of expediency. At times control measures may be successful but unforeseen weaknesses will develop because of the success. Under such conditions counter-measures will have to be developed to counteract these weaknesses.

Therefore, of greatest importance is the sensible attitude of the environmental worker who realizes that a pathogenically sterile environment is not usually attainable and perhaps even undesirable. His efforts are therefore aimed at a minimization of potential hazard and not necessarily absolute elimination. For example, we should not lose sight of those countries where it is not so much a problem of safe food and drink but the lack thereof, and here the aim would

be rendering such food and water as safe as is possible consistent with availability. So the approach to the same problem in two different situations will depend upon the conditions which prevail.

THE "TOO CLEAN"

SCHOOL OF THOUGHT

In answer to the "too clean" school of thought let us pause a moment and ask ourselves how clean is clean? For example, because of its mobility liquid surfaces are relatively easy to clean. Not so solid surfaces. Here we have an extremely difficult situation. Take metallic articles for instance. The outermost layer is gas and moisture adsorbed by the dirt and dust covering the surface. The removal of dirt may be fairly simple but as the surface is newly exposed by removal of exterior dirt, adsorption layers of gases and vapors immediately form. A pure metal surface is rarely, if ever exposed. Examination of solid surfaces after cleaning, such as glass, china or plastic, by special methods will often reveal a surprising amount of foreign matter. Some recent work (5,6) utilizing radioactive tracer techniques has indicated that some types of microorganisms may be so strongly adsorbed on some surfaces that normal methods of washing may remove only a small percentage. It was also found that ease of removal varies with the type of organism, type of surface as well as with the presence or absence of soil and the efficiency of the detergent process which we know also varies with the individual performing it as well as with the equipment used. Under many conditions cleaning, even though properly done, is usually followed by recontamination. Many washing operations are performed quickly and inefficiently. Greasy glasses in bars and restaurants are all too prevalent. Even vacuum cleaning in the home results in deposited dust after a presumably thorough cleaning.

Squalor and filth are still a part of the American scene. Slums still exist. Sanitary control is still largely limited to water, milk and sewage and even in these cases control is of a variable nature. Positive control is primarily a custom in cities. Rural areas have little or

none. Numerous families in the United States still live in squalid surroundings. These observations coupled with such facts that millions of dwellings in the nation lack running hot and cold water, decent toilet facilities, shower or bathtub show that at community and family levels environmental health services and applications are far from satisfactory.

OVER-POPULATION AND PREVENTIVE MEDICINE

Some critics decry preventive medicine on the premise that it leads to overpopulation creating grave problems in housing, feeding and employment. Hanlon (7) suggests that if the areas barred to human use, due to prevalence of disease as in some foreign countries, were either inhabited or rendered safe for habitation, these measures would offset the problem and self-sufficiency would result. Some population experts, however, feel that, because of the constantly increasing birth rate taking place throughout the world and the United States underwriting many of the world's underprivileged and underdeveloped areas, a crisis of the first order has been created. Bertrand Russel, famous mathematician and philosopher has observed that lives may be saved by control of epidemics making the population larger than it would be, but this would be a *short range effect*, and that actually the increase in population due to science is primarily because of machinery, fertilizers, improved breeds of plants resulting in increased yield per acre and yield per man-hour of labor as well as to improvements in transportation. It surely looks as if medical and sanitary science cannot be blamed as the culprits mainly responsible for overpopulation.

SOME ANSWERS

Tiedeman (8) aptly answers some of the arguments against sanitary practices. He states that the criticism against fly control not being justified for the reason that it was originally instituted to check typhoid fever, now rapidly disappearing, is not valid as it has since been proven that fly control is effective against diarrhea to the satisfaction of the most critical

epidemiologist. Furthermore, in the case of foods, should we trust to the whim of some food handler or processor to determine at what time and place and in what quantity we are to be fed sewage and filth which may contain pathogens? Shall we die from typhoid rather than take a chance with poliomyelitis?

The many faceted pattern presented by man's environment, with many modes of disease transmission unknown or merely suspected or the evidence inconclusive and some hard to explain geographical incidences, tends to make many conclusions superficial and on an unfirm foundation.

Our disciplines imply a thoughtful preliminary appraisal of the facts available in relation to the results sought, ensuing weaknesses and strengths and what can be done to bolster the weaknesses so as to establish a final pattern yielding the greatest benefit to mankind. The approach is one designed to *calculate, weigh, and apply*. Hollis (9) summed up present needs admirably when he stated that the four fundamentals of environment — air, water, food and shelter — in the United States right now present a complex assembly of interrelated needs. In each field there are the recurrent needs of administration, personnel, research and positive concepts. Multiply these needs in our nation by a large factor and we have an idea of the needs of other nations of the world in these respects. As Dr. Joseph W. Mountin commented, "Vast amounts of perceptible and controllable disease and disability remain because the social science foundation is relatively weak".

All these facts disturb complacency. The job is not done, it is only beginning. The narrow perspective of some epidemiologists fades into insignificance before the larger, more inclusive concept of environmental health. The stature of environmental health is larger than its infectious disease aspects.

The subject we are discussing is vast, so vast that to do it justice would require tomes of appreciable size. Only pertinent major factors are touched upon here. Snyder (10) has written and presented numerous

articles in a commendable effort to show the broadening scope of sanitation, the need for leadership, education of the public in its various ramifications, the need for teamwork and uniformity in regulations, coordination of services, the practice of preventive sanitation, the standardization of equipment and most important the cooperation of industry, public health officials and private non-profit agencies in unearthing the facts to promote progress in sanitary science. Gibson (11) shows the need for sensible sanitation program planning with the public and industry the principal participants.

Fortunately, the swing to granting sanitation the importance to which it is entitled is shown in the publication of such articles as "A Century of Progress Through Sanitation" as Part 2 of the American Journal of Public Health, June 1953 issue. Several issues of Public Health Reports, 1952 - 1953, contain many excellent articles dedicated to the transformation of sanitation from a static to a dynamic status. Unfortunately, however, these articles do not usually reach the general public, a very important omission. Most of the articles in popular magazines tend to confuse rather than educate. For maximum effect and backing the people must be considered.

AESTHETICS AND NUTRITION

A few words may not be amiss concerning environmental health from the standpoint of aesthetics and nutrition. These subjects deserve serious consideration. Sensory perception cannot logically be separated from the objectives of environmental health. Actually the steps taken to improve the quality of foods are essentially the same steps that are taken to assure a safe food. Improved quality often results in increased consumption and increased consumption may lead to improved nutrition and better nutrition may lead to increased resistance to disease. Filthy or poor quality food may not be hazardous in the true sense of the term but it does produce varying degrees of revulsion, sometimes nausea. The reaction may be momentary or of long duration. However, even though momentary the feeling is akin to a sickness and as such leads

to incompatibility. Therefore, the unaesthetic aspects of man's environment are repulsive, undesirable and dispensable. Pleasant surroundings, attractive, palatable and good quality food contribute to the welfare of man. Unfortunately, the work on improving quality is not spectacular nor meat for the publicity agent and as such suffers in that the incentive stems mainly from economic interests.

Proper nutrition not only promotes health, but basic research: "has compelled a fresh examination of the concepts of resistance and susceptibility and has provided evidence for considering these as separate and manipulable attributes. It has clarified some puzzling aspects of natural resistance and demonstrated the important role of genetic heterogeneity in the pathogenic population as the seat of the events which lead to survivorship in an infectious disease and opened new approaches to the problem of antibody formation" (12).

THE ULTIMATE OBJECTIVE

All efforts directed to the consummation of the ultimate objective of environmental sanitation, coordinated to result in the most beneficial pattern, will owe their success mainly to two things. One is to *educate and motivate* the public at all levels on the importance to daily living of improving environmental sanitation, and the other on the integrity of the professional people in this field of endeavor. *Professional personnel must establish harmony within their own ranks* and realize too that *faith* in their science is mandatory to successful realization of their objectives. To allot more importance to certain professions at the expense of others is not good psychology. To include in the curricula required courses in the biological sciences for engineers and engineering sciences for sanitarians, although necessary and desirable for background purposes, gives both only limited fundamental knowledge in these subjects and this fact should be kept in proper perspective. We plead for teamwork using specialized teams according to the nature of the problem. The combined efforts of the administrator, the research and routine laboratorian, the engineer, entomologist, sanitarian, nutritionist, epidemiologist, social

scientist, veterinarian, physician, medical geographer, the nurse, industrial hygienist, industry and the public at large are all needed for the fulfillment of the dream of complete compatibility between man and his environment. Administrative responsibility should be assigned to those best endowed with this talent and training be he engineer, doctor, sanitarian or other. All professions are of equal value to the public welfare. In our attempts to bring our knowledge and deeds to the public, we are not confronted with the difficulties presented by the popularization of a difficult subject like the theory of relativity, for instance. Our facts and applications generally lend themselves easily to popularization without sacrifice of either clarity or truth. Due to the inherent difficulties involved, the social sciences have been unable to keep abreast of some of the more fortunate sciences, physics is an example in the subject matter, but we can do a great deal by using what sound, basic information social science has discovered. We should remember at all times that restriction of the knowledge and attainments of applied sanitary science to a small group of select individuals leads to stagnation and retards progress. In short our own vested interests should be subordinated to the common good. At the risk of too much repetition, it is reiterated that it is deemed sound logic as well as sound ethics that the general public be given the opportunity through education and motivation to exercise, consciously and intelligently, the knowledge and applications of applied sanitary science at all levels.

A LESSON FROM HISTORY

It may be wise to mull over the following conclusion in Somervell's condensation of Toynbee's *Study of History*, page 555, to wit: "in the process of disintegrations of civilizations we discern a master tendency at work, a tendency toward standardization and uniformity, a tendency which is the correlative and opposite of the tendency toward differentiation and diversity which has been found to be the mark of the growth stages of civilizations". This conclusion is apparently at variance with state-

ments made previously as to the advisability of standardization and uniformity of equipment and regulations in environmental health disciplines. Closer scrutiny of the aims implied will show at once that standardization and uniformity signify a dynamic and not a static aim. Standards would change as well as regulations as newer knowledge and techniques become available. For example, witness the constant revision of both *Standard Methods for the Examination of Dairy Products* and *Standard Methods for the Examination of Water and Sewage*, of national, state and local sanitary codes, of equipment requirements, of the *Control of Communicable Diseases in Man* of the American Public Health Association, which is in its seventh edition. It all actually sums up to standardization with differentiation, uniformity with diversity and this is not meant to be a play on words.

THE PLEA

We have attempted to rationalize the worth and domain of applied sanitary science. It is now imperative that we take ceaseless tactical and strategic action to:

1. Disturb the complacency of the public using effectively the weapons of education and motivation expressing benefits in understandable terms of social and economic gain.

2. Change the present distorted popular conception of sanitation as consisting solely of garbage and sewage disposal by constantly elaborating its manifold aspects and direct bearing on human life.

3. Launch well considered, well planned and well organized programs aided and abetted by public, industry and allied groups placing main emphasis on the preventive aspects of sanitation.

4. Enlist the aid and cooperation of industry and the services in the establishment of equipment standards and uniform regulations pointing out the benefits accruing therefrom.

5. Avoid a dictatorial approach in promotional activities by encouraging initiative and original thinking.

6. Lay the groundwork to assure the wholehearted backing of the medical profession, at least in the future, by implanting the idea of requiring key courses in basic and applied sanitary science, presented

by qualified teachers, at the pre-medical level.

7. Foster mutual understanding, respect and unbiased cooperation among the various government, academic, industrial, service and private non-profit agencies by transcending petty jealousies and petty differences which destroy rather than construct, hinder rather than advance and stagnate rather than motivate our mutual efforts.

8. Convince key administrative executive and budgetary officials by indefatigable persistence using aggressiveness with diplomacy in the presentation of irrefutable facts and logic as to the importance of sanitation to all walks of life.

9. Unite the men of sanitary science by sowing the seeds of accord, meeting on common ground, burying selfish interests, realizing that each specialized field has its limitations and that only by the pooled efforts of the related fields can the total objective, the welfare of man, be achieved.

10. Promote good, sound and adept leadership not only within our ranks but outside as well. We desperately need more leaders who honestly believe in and practice the principles of sanitary science.

11. Give serious consideration to the proposal that we practice public health as a social rather than a medical-engineering science with the professions as the doers and the people as the guinea pigs.

12. Recognize the existence of "social lag" in that scientific knowledge has outstripped social understanding by shrewd but honest direction of activities leading to social acceptance and promotion of environmental sanitation disciplines.

13. Integrate into a coherent whole all environmental factors with progressive research on those least understood so as to result in proper balance to control.

14. Prepare ourselves for our anticipated role in civil defense lest we be caught napping.

15. Integrate our academic and field training in our institutions of learning continuously modifying curricula to fit our constantly changing needs so as to turn out highly qualified prospects for specialized and general careers in environmental health.

16. Raise standards and salaries

in the field of environmental sanitation leading to increased prestige and professional status commensurate with its value to society thereby attracting and holding high caliber personnel.

17. Continuously re-examine our laboratory techniques, improving existing ones, discarding the outmoded, developing new methods designed to more directly tell us what we want to know and placing less emphasis on those which have almost outlived their usefulness.

18. And this above all, as applied scientists, to always bear in mind the proper perspective that our science is a means to an end and not an end in itself. That although we love our science our paramount dedication is to the welfare of mankind.

It is immediately acknowledged that the eighteen points listed present a formidable array of areas of activity very likely to frighten and discourage the faint-hearted but we can either take the attitude that environmental sanitation is a hopeless cause or we can grant this field of endeavor the stature which is its due by utilizing time, patience, money, research and most of all the application of the traditional characteristic of the American people, if I may be excused for lapsing into the vernacular — plain unlimited guts.

To conclude, I believe that the thoughts presented herein, crystallized from the vantage point of twenty-four years of intimate contact with the manifold phases of environmental health both in the laboratory and the field, prove to me, beyond a reasonable doubt, that the worth of applied sanitary science in all its ramifications is beyond argument and that its domain is wide and varied. May I plead that we find ourselves and match the accumulating knowledge with continuous progress in environmental health toward the goal of at least alleviating the environmental miseries of man.

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REPORT OF THE ADVISORY COMMITTEE ON ORDINANCES AND REGULATIONS — 1954¹

INTRODUCTION

The Advisory Committee on Ordinances and Regulations has continued to promote uniformity. It again reiterates its belief that if we are to have the free movement of milk from surplus to deficit areas that is essential to the health of our nation and the welfare of the dairy industry, and if we are to eliminate the costly overlapping of milk inspection, we must have uniform milk ordinances uniformly enforced.

COMMENTS ON ORDINANCE REQUIREMENTS

For the past several years, this Committee has invited comments on ordinances and regulations and on the advisability of changes in ordinance requirements. This request as made in 1952 applied particularly to the *Milk Ordinance and Code, 1953 Recommendations of the Public Health Service*. We regret to report that no suggestions were received from the membership of the Association. However, between 20 and 30 suggestions were made relating to this ordinance by the members of the Committee. These suggestions were

circulated to the Committee members and the 15 suggestions approved by the committee based on replies from not less than 5 committee members are attached as part of this report. It is requested that the secretary present these suggestions to the Public Health Service for their consideration when the ordinance is next revised. Those suggestions on which the Committee could not agree are not included as it is believed that they would accomplish no purpose. They show the difficulty encountered in obtaining unanimity of opinion regarding ordinance requirements.

FROZEN DESSERTS

At the suggestion of the Frozen Food Sanitation Committee, the Advisory Committee on Ordinances and Regulations mainly through the efforts of Mr. O. A. Ghiggoile has prepared suggested requirements for roadside stands dispensing frozen dairy foods. These requirements are written for frozen dairy foods which include ice cream, ice milk, sherbet, and similar products but exclude frozen products made in semblance or imitation thereof and which contain fats or oils and solids other than milk fats and milk solids.

If we include frozen desserts containing fats and solids other than milk fats and solids, this defi-

¹Presented at the Annual Meeting of the INTERNATIONAL ASSOCIATION OF MILK AND FOOD SANITARIANS, INC., Atlantic City, New Jersey, October 21 - 23, 1954.

dition will of necessity have to be changed. The requirements, however, are applicable to all roadside stands dispensing frozen desserts. A copy of the suggested requirements is attached and becomes a part of this report. Copies of these suggestions will be submitted to the Chairman of the Frozen Desserts Committee for comment.

The 1953 report of this Committee recommended that control officials review and revise their regulations pertaining to frozen desserts and make them more specific and establish more uniform requirements. It further recommended that they take immediate steps to revise their ice cream and frozen desserts ordinances to require ice cream to be pasteurized in accordance with the recommendations made by the U. S. Public Health Service. The importance of these recommendations have not lessened.

The Committee also recommended that control officials review their filled milk and filled dairy products laws and regulations and ascertain that they clearly and specifically state their purpose and intent. That this recommendation was opportune is attested for by the report from the Department of Agriculture (July 23, 1954) showing that the production of mellorine and/or mellorine type frozen desserts made with vegetable fats and/or oils other than butterfat in combination with certain milk solids in 1953 was more than double the output of 1952. During 1953, a production of 22,494,000 gallons was reported in comparison with 11,128,000 gallons reported in 1952. No states in addition to those mentioned in the 1953 report have been reported as legalizing the sale of this type of frozen desserts.

NONFAT DRY MILK SOLIDS

The Committee is pleased to report that much progress has been made by the U. S. Public Health Service in formulating recommended standards for Grade A nonfat milk solids. It is expected that these recommendations will be available within the next few months. Such recommendations will be very beneficial in those states operating under Grade A ordinances as it will permit the grading of products prepared from

reconstituted Grade A nonfat dry milk solids. The importance of such a recommendation is shown by the fact that 28 states permit the processing and sale of cultured buttermilk from nonfat dry milk solids. A majority of these states also permit the use of nonfat dry milk solids in the preparation of cottage cheese but only 13 permit their use in the preparation of flavored milk drinks.

HALF AND HALF

The *Milk Ordinance and Code, 1953 Recommendations of the Public Health Service* defines Half-and-Half as a product consisting of a mixture of milk and cream which contains not less than 11.5% milk fat. Nineteen States and the District of Columbia permit Half-and-Half made by the combination of milk and cream. One of these has a fat requirement of 11% to 18%, and one a fat requirement of 11% to 13%. The fat requirement of the remaining 17 States and the District of Columbia range from 10.0% to 12.0% with an average of 11.43%. Five of these permit reconstituted or recombined Half-and-Half which is a combination of reconstituted milk

or reconstituted skim milk with cream or reconstituted cream. Four of these have a fat requirement of 11.5% and one a fat requirement of 11%. Twenty-nine States do not permit the mixing of milk and cream to make a product defined as Half-and-Half

BULK DISPENSERS

The dispensing of bulk milk appears to be gaining momentum. A review of our State requirements shows that 9 states prohibit bulk dispensers, 19 permit them, and 20 fail to make any mention of such devices. Only 2 States have detailed requirements. This Committee recommends that control officials study bulk milk dispensers and review and revise their regulations to ascertain that only sanitary dispensers are permitted in their jurisdiction.

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William Hoskisson
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Stephen J. Wolff
C. J. Babcock, *Chairman*

REPORT OF THE COMMITTEE ON DAIRY FARM METHODS — 1954¹

It has been the purpose of the Dairy Farm Methods Committee, in its report of 1953 and the report now submitted, to assist the milk producer in accommodating himself to new developments in the industry.

The 1953 report dealt with the development of "Bulk Handling of Milk on the Farm and Its Transportation to the Plant". We felt this was a timely subject and the report, containing a summary of data collected from questionnaires returned from all parts of the country, has been well received.

This year the Committee decided to deal with specific problems arising out of the growing popularity on the farm of the milking parlor, pipeline milker, and farm tank. The following subjects were considered of paramount importance

and Committee members were invited to submit studies on the subject in which they had most interest:

I "Method of Cleaning and Sanitizing Farm Tanks".

II "Operation of Pipeline Milker Installations in Both Milking Parlor Units and Stanchion Barns".

III "In-Place Cleaning Methods and Bactericidal Treatment of Pipelines".

IV "The Construction of Milking Parlor Units".

After receipt of these studies it was found that the material submitted on Subjects II and III overlapped to such an extent that it was impractical to separate them and the report as now submitted combines these two topics. All individual studies were analysed, condensed into one report on each subject by the Chairman, and returned to the Committee for final ratification.

¹Presented at the 41st Annual Meeting of the INTERNATIONAL ASSOCIATION OF MILK AND FOOD SANITARIANS, INC., Atlantic City, New Jersey, October 21-23, 1954.

We believe that the popularity of the methods dealt with in our report this year is largely attributable to the fact that their simplicity of operation and cleaning promotes labor-saving practices on the farm. In addition, the milking parlor offers the producer considerable savings in construction costs. Along with these savings, it has been found that the quality of milk has been improved wherever these methods have been combined with sound sanitation practices.

METHODS OF CLEANING AND SANITIZING FARM TANKS

Much has been written on the sanitary aspects of bulk milk handling on the farm. Many advantages have been pointed out: a gleaming, stainless steel tank is easier to clean than a collection of 10-gallon cans, and the quick cooling inhibits bacterial growth. However, a sanitation problem can arise if the producer is careless in cleaning his tank.

Facilities

1. The tank should be so located with respect to walls and other equipment that the cleaning operation may be easily accomplished. Clearances should allow at least 2 feet.

2. Artificial and natural light should be so placed as to facilitate ease of seeing milk contact surfaces for inspection and cleaning. Light fixtures should be so arranged as to avoid their becoming a possible source of contamination when the tank lid is open.

3. The following supplementary equipment should be available:

- a. Properly designed brushes.
- b. A rubber or plastic pail for mixing hot water and detergents.
- c. An efficient sprayer, or other suitable device, for sanitizing the tank.

d. A supply of detergents, acid cleaners, and sanitizing agents of a type suitable for the purposes intended.

4. Hot and cold water of sufficient volume under pressure should be provided in the milk house. A mixing valve on water lines is necessary for mixing hot and cold water, or steam and cold water. The size of hot water tank needed varies with the size of the operation. (It was the recommendation of the Committee in the 1953 report that a 50-gallon heater should

be the minimum size for use in connection with bulk handling of milk on the farm.)

5. Sufficient hose should be attached to the mixing valve to reach all parts of the tank, inside and out. The hose should be of such quality as to be adaptable for use with hot water.

Procedures

1. As soon as the tank is emptied, rinse with an ample volume of lukewarm (100-110°F.) water to accomplish removal of visible milk films. (The compressor or sweet water pump first should be turned off.) This rinsing is best done through the use of a hose connected to an outlet where hot and cold water can be mixed to secure the desired temperature. As reported in the 1953 report of this Committee, it was found most feasible to have the hauler perform this initial rinsing of the tank.

2. To continue the cleaning operation, dissolve in a rubber or plastic bucket of hot water the alkaline detergent in an amount and at the temperature recommended by the manufacturer. The use of a soft bucket prevents marring or scratching of the tank. Once a week use a liquid acid cleaner instead of the alkaline cleaner to wash all parts of the tank and follow with the usual complete rinsing. However, in case of extremely hard water, an acid cleaner should be used more frequently.

3. The next step is to wash carefully all surfaces of the tank with the cleaning solution. This should be done with a long-handled brush, going over all surfaces with which milk may come in contact.

4. In order that all parts of the tank may be thoroughly cleaned, completely disassemble the outlet valve and handbrush all fittings, as well as the tank lid, bridge, agitator, and measuring stick. Properly designed brushes will facilitate this operation. In addition, it is good housekeeping to wash the outside of the tank, keeping it clean at all times. (Note: Under no circumstances should an abrasive material such as steel wool be used to clean stainless steel equipment. To remove discoloration follow the recommendation of the tank manufacturer.)

5. Assemble dismantled parts

and rinse the tank and all fittings thoroughly with hot water (130°-140°F.). Then allow the tank to drain with covers closed until just prior to milking time when it must be sanitized. Measuring stick, sample dipper and other small equipment must be stored in a sanitary manner until sanitized immediately before use.

6. The tank must be subjected to sanitization immediately prior to the first milking. This is accomplished by mixing about one-half gallon of water with a chlorine² compound in the rubber bucket and mixing according to directions a solution consisting of 100 parts of chlorine to 1 million parts of water. Be sure directions are followed in mixing the chlorine solution as too strong a solution may be injurious to the metal parts and too weak a solution will not sanitize properly. The solution is sprayed on the interior of the tank, using an efficient sprayer to cover all surfaces with which milk comes in contact. The outlet valve is opened to allow any excess solution to drain off. A rack containing all brushes, the sprayer, and other cleaning equipment should be installed in a position easily accessible to the tank.

Special attention should be given to:

1. The need for prompt rinsing and cleaning after emptying the tank.

2. Remind the producer that the bulk tank does not eliminate sanitation problems posed by the milking machine, cows' udders, and other possible points of contamination.

3. The proper use of right amounts of cleaning and sanitizing agents.

4. Avoiding use of extremely high temperature solutions on direct expansion type coolers.

5. Daily washing and sanitizing of the underside of the tank bridge.

²There are sanitizing agents other than chlorine approved for this purpose, but chlorine is in most general use.

CLEANING AND OPERATION OF PIPELINE MILKER INSTALLATIONS

The use of cleaned-in-place pipelines has been rapidly increasing for the past several years, particularly in conjunction with the farm tank. They are a reality in the plant and their use on the farm surely will grow in popularity in years to come.

Properly applied, they definitely improve labor efficiency and cut cleaning costs.

C-I-P systems have their place on the farm if properly handled and it would be most unfortunate for this potentially valuable tool to be discredited because poor results are obtained with improperly used cleaning procedures. It is obvious that considerable merit attaches to the proper application of the in-place cleaning procedure. The system must be kept clean, clean physically and clean bacteriologically. Many pipeline systems, both in milking parlors and stanchion barns, have been, and are being studied by regulatory agencies, equipment suppliers and research personnel. Most systems can be cleaned successfully but it is difficult to prescribe one set of materials and conditions which would cover the proper operation and sanitation of all systems.

For a method of determining general cleanliness the recommendations of the U. S. Public Health Service may be of interest. On page 70 of the 1953 edition of the U. S. Public Health Service Milk Ordinance and Code there appears this statement: "Cleanliness may be determined by sight, touch, or smell, by observation through a magnifying glass, by wiping with tissue or filter paper, and by other approved methods". According to this Code "bacteriologically clean" may be interpreted to mean not more than one colony per milliliter of capacity, or not over 100 colonies per eight square inches (or 2 per square centimeter) as determined by the agar plate method.

The 3-A Committee, on which the International Association of Milk and Food Sanitarians is adequately represented, has made recommendations for in-place cleaning of pipelines used in milk plants (*J. Milk and Food Technol.*, 16:77-78, 1953). The recommendations insofar as materials, construction and installation of the systems in plants are concerned, can for the most part be applied also to farm installations.

In surveying dairy farms having C-I-P pipeline systems, two types of installations are prevalent:

1. A pipeline circulating system where the milk lines are arranged

in a circuit around the stanchion barn.

2. Milking parlor setups which have relatively short piping systems from the milking parlor to the milk house.

In the main, there are two C-I-P arrangements employed with the above pipeline systems. They are set forth in the following with their variations:

A. VACUUM SYSTEM

1. *Vacuum-Flush Recirculation*— This system is designed so that the air which mixes with the water and cleaning solution provides violent brushing action and adequate velocity for proper cleaning. Equipment requirements are:

a. milk line and a fixed return circulating line beginning and ending in the milk room.

b. line manifold and teatcup manifold.

c. stainless steel wash tank of sufficient size to allow for a reserve of solution to remain in the tank at all times during recirculation.

d. washing solution, return pump, releaser, milk pump or any other suitable equipment necessary to complete the circulation system.

2. *Reverse Flow Vacuum Flush* — This system provides an arrangement by which the flushing action is automatically reversed, thus leading to a more or less continuous operation.

The first rinse must be discharged down the drain, but subsequent washing and rinsing can be continued for as long as required. This type of operation is used in milking parlor systems and has been found to yield satisfactory results. Sufficient time should be utilized during all phases of the cleaning operation to adequately flush, wash, and sanitize the pipelines.

3. *Simple Vacuum Flush (Air-Brush)* — This system provides for in-place cleaning of single milk pipelines up to 40 feet in length, where no return pipe is used, by drawing through each teatcup cluster and milk valve the successive rinsing and cleaning solutions. The "air-brush" cleaning action is provided by alternately raising and lowering the teatcup clusters allowing first water, then air, to rush through the milk line.

While some reasonably satisfactory results have been noted, it

is the feeling of your Committee that there are certain limitations inherent in this system which make doubtful a consistently satisfactory result. This conclusion is based upon the belief that adequate time for treatment and adequate quantities of solution are highly important in obtaining a clean piping system. With this simple, vacuum-flush installation, quantities of rinse water and washing and sanitizing solutions are strictly limited and this may adversely affect the end result. However, this method is being practiced on many farms with satisfactory results (*J. Dairy Sci.*, 36:303-308, 1953).

B. *PRESSURE SYSTEM* — This system provides for in-place cleaning by forcing the cleaning solutions through the pipeline by means of a pump having sufficient capacity and velocity to maintain a full line at all times to assure effective cleaning. This arrangement is generally used in the conventional milking barn, but may be applied in the milking parlor also. It is similar to those used in cleaned-in-place operations in dairy plants.

RECOMMENDATIONS

A definite cleaning-in-place procedure, adapted to the particular pipeline installation, should be established by the producer and a copy of the procedure posted conspicuously in the milk house. The following general procedure is recommended by this Committee:

1. Immediately after milking, rinse the teat cup assembly and brush clean the outside surfaces of the milking unit.

2. Completely flush the entire system, including teat cup assemblies and milk hose, with warm water (100-110°F.) until the discharge runs clear.

3. Immediately after the rinse, circulate cleaning solution for at least 15 minutes. The solution temperature should be 130-140°F. and the strength should be at the level recommended by the manufacturer. (An acid detergent solution should be used at least once a week in order to prevent a build-up of soil.) The amount of solution must be sufficient to provide a reserve in the wash tank at all times.

4. After draining cleaning solution, thoroughly rinse the line with hot water (130-140°F.) so as to completely remove all traces of the cleaning solution.

5. Immediately before use, flush all milk contact surfaces with a 100 ppm. chlorine solution, or other approved sanitizing agent, for at least 5 minutes.

6. Completely drain the entire pipeline system.

This Committee further recommends that the producer give special consideration to the following notes on in-place cleaning of pipeline systems:

1. As systematic cleaning method should be used after each milking and the mere flushing of equipment after milking should not be practiced.

2. An adequate supply of running cold and hot water should be provided. Generally speaking, the hot water supply should be at least 50% more than the actual quantity necessary for rinsing, cleaning, and sanitizing the system according to the established procedures. However, this "rule of thumb" may not be applicable where water heaters with rapid recovery are in use. Obviously, the type of C-I-P system employed is the greatest factor in determining the amount of hot water required. For instance, the Vacuum-Flush Recirculation System requires less solution than the Pressure System which requires that the line be completely full from beginning to end with a reserve in the wash tank.

3. During the period of recirculation, temperature of the wash water should not be permitted to fall below 120°F. Beyond that, cleaning solution temperature should be in accordance with the recommendation of the manufacturer of the chemical used. Some type of approved booster heater may be necessary to maintain proper temperature in cold climates.

4. The detergents used should be compatible with the particular water supply on the farm. Here again, the manufacturer's directions for mixing the proper concentrations of the cleaning and sanitizing solutions, and the application time for the two solutions, should be carefully followed.

5. Cleaning solutions for use in C-I-P systems should be freshly prepared for each use.

6. To avoid possible adulteration of the milk with water from the

cleaning or sanitizing solutions, the pipelines should be allowed to drain so that no solution will remain in them at milking time. A properly installed line should have sufficient pitch to enable full drainage or drainage ports should be properly placed to accomplish this purpose. (When cans are used in shipping milk, particular care should be taken that cans are free of water before filling with milk.)

7. Sponges or swabs should not be used to push milk out of the line.

8. Even though they are an integral part of the circulating or cleaning system, teat cup assemblies should be cleaned manually in addition to the cleaning they receive as components of the C-I-P system.

9. Cleaning solutions producing little or no foam do a more thorough cleaning job.

10. All adjuncts to the pipeline system such as valves, can filler equipment, etc. shall be rinsed, brushed, and hand washed and sanitized in the conventional manner after each use and stored in a sanitary manner.

11. When not in use, the pipeline system, including milk valves and all other openings, should be closed or capped to prevent contamination.

12. Pipelines intended for in-place cleaning should have no dead ends; they should be installed with adequate slope for drainage and they should have lines firmly anchored in place.

13. All milk contact surfaces, solution lines, wash tanks, fittings, vacuum lines from the air separator to the moisture trap should be constructed of stainless steel, heat resistant glass, or equally corrosion resistant material which is non-toxic and non-absorbent.

14. Periodical disassembly of pipeline for observation is advisable.

The Committee also wishes to note that if a build-up of soil in the pipe-lines is found, the operator probably has not followed a consistent and acceptable clean-up procedure. On the other hand, where an efficient clean-up procedure is faithfully and consistently followed, the physical appearance of the lines will be very good.

THE CONSTRUCTION OF MILKING PARLOR UNITS

The development of the present day milking parlor has been a rapid process in recent years. Originally it was designed for use on large farms with large herds; now modification and adaptations have enabled its use on farms with a limited number of cows. In a recent survey of 251 milking parlors in a midwestern market, it was found that 92.7% of them had been installed during the past four years.

The increasing cost of building has added impetus to the installation and use of milking parlors. In fact, "decreased investment in buildings per cow handled" has been especially emphasized in their promotion. Another major feature advanced is that of labor saving and ease of work. In the survey mentioned above, the producers interviewed gave several pertinent reasons for installing their milking parlors. Prominent among these were:

1. A desire to increase their herd without building a new barn.

2. It was cheaper to get back into production after buildings were destroyed by fire or wind.

3. "Less work with a milking parlor."

4. "Always try new ideas."

5. "Jim Brown got one, so I put one in — he can't have anything I don't have."

Labor saving and the fact that they no longer had to stoop when the elevated stall type was used were most prominently mentioned by producers. Not having to carry milk so far was another frequently mentioned labor saving feature. Studies indicate that the amount of labor saved is largely dependent upon the individual and also closely related to the balance of the farm installations, particularly feeding and bedding areas. *It is quite possible to have an efficient milking parlor and lose any advantage thus gained through poor arrangement of the feeding and bedding areas.*

It is important that the producer planning the construction and operation of a milking parlor make a carefully studied sketch of the overall building arrangement, including adjacent space for bedding and feeding areas, building ap-

proaches, cross-traffic lanes, etc. Such careful pre-planning of the milking parlor is necessary to assure success of the operation from the standpoint of correct organization of the work routines and centralization of all activities.

The following suggestions might be kept in mind by the producer when planning the location and construction of any one of the several types of milking parlors:

Since it is common practice to include the milk house in the milking parlor building, it is necessary that the building be accessible in order to accommodate the milk hauler during all seasons.

Concrete block or cinderblock construction provides a very satisfactory building material. Ceilings may be of lumber or building board.

Artificial lights directed to the working area help in labor utilization. Lights from below are particularly helpful. Artificial light is needed during 80 per-cent of milking time.

Heat is essential in milking parlors in northern sections of the country. Suitable working conditions for the operator and warm machines for milking conserve labor and make the job of milking more pleasant.

Hot and cold water under pressure, together with a mixing valve and attached hose, are a necessity in the operator's pit area. It is especially helpful to have warm water available when preparing cows for milking.

A concrete paved yard and feeding area with a paved entrance-way to the parlor result in less dirt being carried into the parlor by cow traffic. Entrance-lanes which permit cow traffic in single file only, avoid crowding and pushing into the parlor.

COMMON TYPES OF MILKING PARLORS

The types of milking parlors in most common use are the Tandem Type Stalls and the Lane Type (Walk-thru) Stalls.

Tandem Type Stalls

The present tendency is to have either a 3-stall tandem with elevated platform or 4 or 6-stall elevated platform with an even number of stalls on each side. This latter arrangement is best from a labor standpoint, but to have two en-

trances and two exits sometimes presents a construction problem. The necessity of a cross-over for cows on one or both ends of the 4-stall unit cuts the labor saving features of this type parlor as it increases clean-up time and, unless a pipeline milker is used, can materially interfere with the transport of the milk to the milk house. Too many milking stalls defeat their own purpose, as clean-up time absorbs any time saved and investment per animal milked becomes excessive.

These stalls are constructed in line with a 30 to 36 inch alleyway, through which the cows pass as they enter or leave the parlor. Both the stalls and alleyway are at a level of 28 to 30 inches above the operator's floor level. All gutters slope to drains connected to a 6-inch tile drainage system. Splash grills and drains under each cow with the floor graded to the grills may be provided. Good sanitation requires that all grills and drains be flushed daily.

A curb 12 inches high between the cow and operator with a 22-inch notch provides ease of operation and anti-splash protection for the operator, although curbs four inches high without a notch often are used. A 6-inch inset underneath the curb provides space for the toes of the operator, adding to the comfort and ease of operation.

Lane Type (Walk-thru) Stalls

This type usually consists of two lanes of two stalls each on either side of a 5-foot wide pit. The surface of the lane type stalls is approximately 30 inches above the operator's pit floor level. A curb 12 inches high between the cow and operator with a 22-inch notch provides ease of operation and anti-splash protection for the operator, although curbs 4 inches high without a notch are often used and make a simple construction. A 6-inch inset underneath the curb provides space for the toes of the operator, adding to the comfort and ease of operation.

Floor surfaces of the cow lanes and of the operator's pit slope laterally to drainage gutters. Tile with a minimum diameter of 6-inches provides satisfactory drainage. The foregoing items are im-

portant to parlor cleaning as well as removal of liquids during the actual milking.

Note: We suggest Marketing Research Report, No. 64, May 1954, U. S. Department of Agriculture, entitled *Meeting Dairy Market Sanitation Requirements Economically* be noted for its study indicating "that with good practices milk of consistently high quality can be produced with a relatively low investment in buildings, and with half or less labor than is commonly used on farms".

In presenting this report, the Committee recognizes that bulk handling of milk on the farm is comparatively new and experiences to date are somewhat limited. We know further changes will come with additional improvements and new, more efficient methods will develop.

Suggested changes will have to be constantly reviewed to keep abreast with new developments. It is hoped, however, that the review of the methods now in use and suggested standard procedures contained in this report will serve as a helpful guide to those using this system on dairy farms.

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C. F. Hanger
Milton E. Held
Russell R. Palmer
C. W. Pegram
A. G. McLeod
James M. Doughty, Jr.
Dr. Richard S. Guthrie
L. O. Tucker
Dr. Robert Metzger
Chester F. Bletch,
Chairman

THE NEED FOR SALESMANSHIP

Continued from Page 94

Foundation would like to participate by offering appropriate recognition for the winners. I cannot make this an unlimited offer, but would like to develop the idea with the first five health departments that tell me they are interested. We will then work out the details.

I will close by suggesting that if you sanitarians, in your daily work, will follow the principles and methods of salesmen, instead of policemen, you will not only have an easier and more pleasant life, but you will make a much more significant contribution to our great dairy industry.

REPORT OF THE COMMITTEE ON FOOD EQUIPMENT — 1954¹

For the past year this committee has worked with both the National Sanitation Foundation and the Baking Industry Sanitation Standards Committee on their respective equipment standards program. The Chairman of this committee has also acted as the INTERNATIONAL ASSOCIATION OF MILK AND FOOD SANITARIANS, INC. representative to the National Food and Beverage Council sponsored by the National Sanitation Foundation, and related industry and public health groups. The work of this Council, after two meetings, is still in the formative stages and nothing conclusive can be reported at this time. Another meeting is scheduled for the near future at which time it is hoped something definite can be developed.

It has been demonstrated this year that the chairman of the equipment committee should not be charged with other important committee activities which will limit the time he can spend on equipment meetings.

The following report will cover the work accomplished during the year together with specifying certain recommendations which it is felt will make the functioning of this committee more effective.

CO-OPERATION WITH THE NATIONAL SANITATION FOUNDATION

Two meetings of the Joint Committee on Food Equipment of the National Sanitation Foundation were held at which the Chairman of the Equipment Committee represented the ASSOCIATION. The primary considerations were Standards No. 4 and No. 5, "Commercial Cooking and Warming Equipment", and "Hot Water Heating Equipment", respectively. Comments from the committee members on the fifth draft of Standard No. 4 have been forwarded to the National Sanitation Foundation. It is hoped this Standard will be completed and sent to the Council of Consultants after the December

meeting. Standard No. 4 has taken a great deal of time for development and represents a great deal of work on the part of all concerned.

After extensive discussion on hot water heating equipment it was agreed by all representatives at the meeting that this Standard should be abandoned in favor of the development of a supplement to Standard No. 3. It is proposed that this supplement take the form of a manual on hot water requirements and would be based on actual data secured in field studies and research.

Reports are being received that more and more equipment is being placed in the field bearing the National Sanitation Foundation Seal of Approval. As the program develops it becomes quite apparent that enforcing agencies will need to take formal steps to require that equipment meet these standards if their full value is to be realized.

During the past year the National Sanitation Foundation teams have inspected and reinspected plants using the Seal. The results indicate that this phase of the program is going forward in fine shape.

As problems arise on Standards 1 to 3, inclusive, they are discussed and amendments are proposed and acted upon where necessary. Along with this, it has been pointed out that special devices not specifically covered in any Standard are in need of standardization. A procedure is being developed whereby special devices can be approved for use of the Seal without it being necessary to develop a special Standard. Copies of this proposed plan are in the hands of the committee members for their consideration.

During the year a question was raised concerning who was to develop standards for bulk milk dispensers. Your ASSOCIATION has an agreement with the 3-A Standards Committee to work with them in the development of all standards on milk equipment. Accordingly, when it was suggested that the National Sanitation Foundation develop standards on bulk milk dispensers it was necessary to point out that we had previous commit-

ments and would be unable to work with them on it. Accordingly, efforts are being made to arrange a meeting between both groups so that the area of activity of each will be more clearly defined. Next year should see this definition of the scope of each group completed.

CO-OPERATION WITH THE BAKERY INDUSTRY SANITATION STANDARDS

COMMITTEE

The Committee Chairman attended two meetings with the Baking Industry Sanitation Standards Committee continuing to serve as a consultant representing the INTERNATIONAL ASSOCIATION OF MILK AND FOOD SANITARIANS, INC. Listed below is the status of the sanitation standards as of August 13, 1954. It can be noted that in May of this year two new standards were published, namely, "Horizontal and Vertical Mixers", and "Conveyors". It is recommended that our Association formally endorse these two new standards.

STATUS OF BAKING INDUSTRY EQUIPMENT AND SANITATION STANDARDS AS OF AUGUST 13, 1954

STANDARD	STATUS
1. Flour Handling Equipment	Published June 1, 1952
2. Dough Troughs	Published Aug. 1, 1952
3. Mechanical Proofers	Published Aug. 1, 1952
4. Pan, Rack & Utensil Washers & Industrial Sinks	Published Jan. 1, 1953
5. Cake Depositors, Fillers & Icing Machines	Published Sept. 1, 1953
6. Horizontal Mixers & Vertical Mixers	Published May 1, 1954
7. Conveyors	Published May 1, 1954
8. Bread Moulders	To be finally reviewed
9. Bread and Cake Ovens	Chairman to be appointed
10. Dividers and Rounders	To be reviewed
11. Doughnut Equipment	In Task Committee

¹Presented at the 41st Annual Meeting of the INTERNATIONAL ASSOCIATION OF MILK AND FOOD SANITARIANS, INC. Atlantic City, New Jersey, October 21-23, 1954.

12. Enrobers and Icing Machines	In Task Committee
13. Ingredient Containers	In Task Committee
14. Ingredient Water Coolers	To be reviewed
15. Mixers — Spindle	Task Committee being constituted
16. Pan Greasers	Chairman to be appointed
17. Pans	To be reviewed
18. Pie Making Equipment	Chairman to be appointed
19. Proof Boxes, Fermentation Rooms & Coolers	To be reviewed
20. Racks, Pan Trucks, Skids, Pallets & Dollies	In Task Committee
21. Scales	Chairman to be appointed
22. Wrappers and Slicers	In Task Committee

For some time now it has become apparent that a separate representative should be available for each of these two groups. For the coming year, however, with the approval of the President and President-elect, a Sub-Committee Chairman has been appointed to act under the Committee Chairman to represent the ASSOCIATION at the Baking Industry Sanitation Standards Committee meetings. Both the NSF and the BISSC although involved in food operations are quite far separated due to special problems. Accordingly, it was felt that a specialist should be representing us in both cases. The Sub-Committee Chairman who has been appointed is Mr. Vincent T. Foley, Bakery Specialist with the Kansas City, Missouri Health Department. The Baking Committee is a very hard working group which has done a very commendable job of standardizing baking equipment. Each year, however, their job becomes more difficult because the equipment they are working on is progressively more difficult to design for more ease of cleaning and accordingly demands the consideration of a bakery specialist to do a satisfactory job of consulting on design.

RECOMMENDATIONS

The committee work this year has progressed as shown in the

above report. The following suggestions and recommendations, however, should make the work of this Committee even more valuable.

1. It is recommended that several sanitarians, actively engaged in bakery sanitation, be appointed to the Sub-Committee on Bakery Standards.

2. The Committee Chairman who is responsible for the activities of both the National Sanitation Foundation and the Baking Industry Sanitation Standards Committee should not be given other duties which will limit the time which he can devote to this very important work.

3. Future planning should be aimed at preparing for an increased demand from related food industries for consultative advice from our ASSOCIATION, and this can only be accomplished through Sub-Committees composed of persons experienced in the special field where the problems exist.

4. It is highly recommended that at least one committee meeting during the year be arranged if possible so that the man in the field can help the Chairman do a better

job of representing the ASSOCIATION.

5. With so many qualified personnel within our ranks who can help substantially in the Committee's work, every effort should be made to recruit them and provide finances where necessary to further the sanitary design of food equipment.

6. It is recommended that at least five members be appointed to assist the representative to the National Food and Beverage Council for the coming year.

7. It is recommended that the ASSOCIATION endorse the two new standards prepared by the Baking Industry Sanitation Standards Committee. They are: (1) "Horizontal and Vertical Mixers", and (2) "Conveyors".

John H. Fritz, Chairman
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HOLD MEETING IN CHICAGO JANUARY 20 - 21

Most chemicals added to foods are fundamentally a component of some natural food, a group of chemical executives was told today, and they contribute to improved nutrition, better health, increased longevity, and the gradual disappearance of dietary diseases.

The occasion was a joint meeting on chemicals in foods and feeds, sponsored by the Commercial Chemical Development Association and the Chemical Market Research Association. In advance of the two-day meeting, held in the Edgewater Beach Hotel, the delegates on Wednesday visited the agricultural research farm of Chas. Pfizer & Co., at Terre Haute, Ind., where they toured the company's scientific installations.

Two symposiums highlighted today's opening meeting—one on "Chemicals and the Feed Industry" and the second on "Chemicals and the Food Industry." At a luncheon meeting, Robert C. Liebenow,

secretary of the Chicago Board of Trade, outlined the activities of the Board of Trade and their relation to industry and agriculture.

In a paper on chemicals used as food additives, Rufus A. Barackman, of the Victor Chemical Works, pointed out that such additives prevent foods from spoiling, enhance their nutritional quality, and improve their physical properties. "Most chemical additives which are used today", he added, "are fundamentally a component of some natural food, either having been isolated from a food or having been synthesized". "As such", he declared, they contribute to improved nutrition, better health, increased longevity, and to the gradual disappearance of dietary diseases."

The changing shopping and eating habits of Americans have brought new requirements in food sanitation, C. W. Weinreich, research director of Cherry-Burrell

Continued on Page 114

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..... Abilene

Two years; Lige M. Fox.....Big Springs
One year; D. H. EvansAustin

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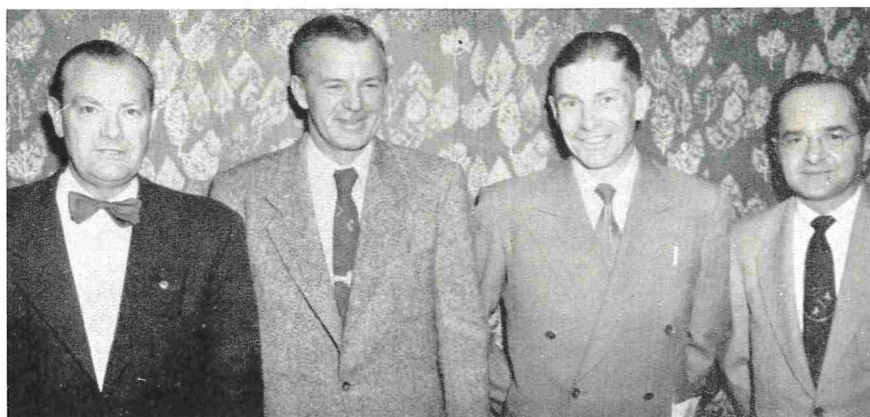
..... Bellingham
Sec.-Treas., George Andrews, Room 125
Ferry Terminal, Pier 52, Seattle 4,
Washington.

WISCONSIN MILK SANITARIANS
ASSOCIATION

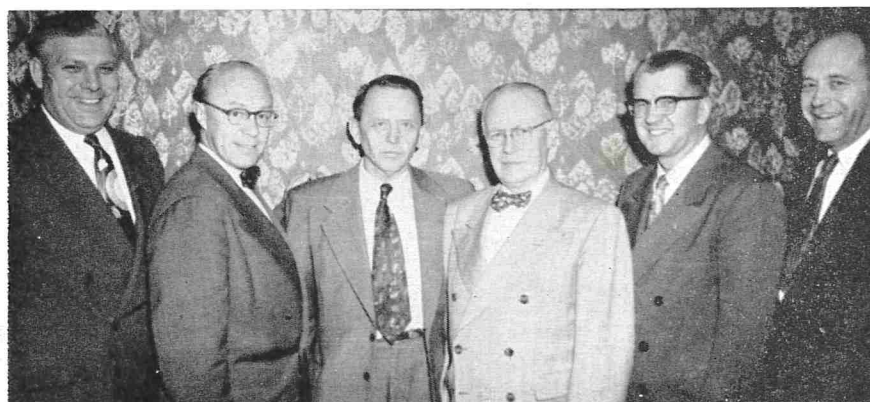
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Officers Rocky Mountain Association Milk and Food Sanitarians, left to right: William Hoskisson, President-Elect; Ray Iiams, President; William E. Polzen, 2nd Vice-President; Peter G. Stevens, Secretary-Treasurer.



Speakers at Annual Meeting of the Rocky Mountain Association Milk and Food Sanitarians, left to right: Gene Tuttle, Past President, Grand Junction, Colorado; William Hickey, Chairman, IAMFS, Food Equipment Committee, Salt Lake City, Utah; W. K. Mosley, Mosley Laboratories, Indianapolis, Indiana; C. A. Abele, Chairman, IAMFS, Sanitary Procedures Committee, Chicago, Illinois; Dr. A. J. Morris, Utah State College; Harold J. Barnum, Denver Health Department.

HEALTH CAREERS GUIDEBOOK

Publication of the HEALTH CAREERS GUIDEBOOK, giving the most comprehensive view of health occupations ever undertaken, was announced today by the National Health Council. A 160 page text-and-picture documentary, the GUIDEBOOK covers 156 different occupations in all kind of health services from hospital maintenance to creative scientific research. Published by the Council and supported in the public interest by one of its sustaining members, the Equitable Life Assurance Society of the United States, it is the first step in the Council's new Health Career Horizons Project.

The GUIDEBOOK is being distributed without charge to every one of the nation's more than 29,000

secondary schools and junior colleges, and through this nationwide distribution will reach their 7½ million teen-age students.

Intended primarily for use in secondary schools, the GUIDEBOOK is being presented to the National Association of Secondary-School Principals today, as one of the events of its 39th Annual Convention in Atlantic City. The invitation to issue the book at this time came to the Council through a special Health Careers Advisory Committee, appointed by the National Vocational Guidance Association, is also advising the Project staff. Through the cooperation of both committees, the GUIDEBOOK was given an informal pre-test by students and educators in 30 schools.

During the presentation, the GUIDEBOOK will be turned over to Mr. A. W. Dent, President of Dillard University in New Orleans and of the National Health Council, by Dr. Norvin C. Kiefer in behalf of the Equitable Society, of which he is Chief Medical Director. Dr. Kiefer is also a member of the Council's Board of Directors. After accepting the GUIDEBOOK, Mr. Dent will present first copies to Dr. James E. Blue, President of the NASSP, and to other officers of both the national association and its affiliates in the states. This presentation inaugurates the distribution to secondary schools which will take place during the next month.

titude of Dairying. Committee reports were given and the new officers were elected. Rather than having a program of our own, we took part in the regular Institute program. I am enclosing under separate cover, a picture of those in attendance at the Institute, in the event you should be interested in using it in the Journal. The officers elected are as follows: President, W. J. Oldenburg, owner Universal Laboratories, 1250 Rainier Ave., Seattle, Wn.; President Elect, C. R. Mike O'Connor, Seattle-Health Dept., 425 So. Garden St., Bellingham, Wn.; Secretary-Treasurer, George Andrews, State Dept. of Agriculture, Room 125, Ferry

demand. That makes it timely, says the state department of agriculture, to point out that a liaison committee is continually at work to protect the public, agriculture and dealers against possible hazards of economic poisons.

Why? Well, because the state board of health, the state college and the department recognize that some of the newer organic chemicals, as well as some of the old standby products, can cause trouble for both crops and humans if not properly used.

Carelessness is the greatest single cause of improper usage. That is why the department of agriculture is bearing down this year on a



Group attending 27th Annual Institute of Dairying, Pullman, Wn.

March 15, 1955

H. L. Thomasson, Exec. Sec.
International Ass'n. Milk and
Food Sanitarians Inc.
P. O. Box 437
Shelbyville, Indiana

Dear Red:

I wish, first of all to congratulate you on the manner in which you are now mailing the Journal of Milk and Food Technology. Now we can open it without tearing or cutting the pages.

Last week, on Tuesday, March 8th, the Washington Milk Sanitarians Ass'n. held their annual meeting at Pullman, Wn. It was held at the State College in conjunction with the 27th Annual Ins-

Terminal, Pier 52, Seattle, 4, Washington.

Of course Gene Locke, as immediate past-president is still on our board of Directors, along with the 4 section chairmen. The section chairman elections will be held at the section meeting in June.

Very truly yours,
George Andrews,
Sec. Treas.

**OREGON DEPARTMENT OF
AGRICULTURE WORKS TO TAKE
HAZARDS FROM USE OF
SPRAY MATERIALS**

With ground being turned for early home gardens, it won't be long before crop sprays and dusts are in

provision in the state economic poisons law which says these materials even when they are not toxic or poisonous can't be sold in broken packages, unless the package is labeled the same as the original container. (You'll know the toxic materials by the skull and crossbones on the package; they can't be sold in anything but the manufacturer's package.)

This emphasis on labeling broken packages stems from carelessness in handling such a purchase after the material is used a few times. Often the unlabeled bag is tossed away in the garage, some corner of the basement or some shelf in the house. Everyone forgets what's in the package — until some of the

children get into it. And then it may be pretty late to think back on what the package contains.

"That's why it is a pretty good idea to keep these economic poisons under lock and key," declares O. K. Beals, chief of the department of agriculture division responsible for enforcing the economic poison law. And that's one reason why the liaison committee is looking carefully at all new products coming onto the market. Besides aiming for protection against human health hazards, this committee scans products to protect rightful agricultural uses and to determine where it may guide both farmer and the public in proper uses.

Economic poisons, by the way, is a general term to cover insecticides which kill insects, herbicides which kill weeds, fungicides which kill fungus, and rodenticides which kill small animals (rodents) and birds.

Here are some other things to remember when buying these materials, Beals says:

1. Generally speaking, the law recognizes two kinds of economic poisons—those that are highly toxic and those that are not highly toxic.

2. Don't ask your dealer to sell you a broken package of any highly toxic spray or dust. He can't do it, legally.

3. If you buy a broken package of a non-highly toxic product, be sure it has exactly the same label as the package from which it was taken. For protection of both you and the dealer such packages must bear the name of the product, the brand or trade name, the name and address of the seller, the name and percentage of each active ingredient, the net weight, and, if needed, adequate directions for proper use.

4. Don't quarrel with your dealer when he says some products can't be sold to anyone but commercial users. That's right. The department has limited sale of the most highly toxic materials to experienced applicators only. That means persons trained in proper usage and equipped with protective clothing when applying them. The department of agriculture, division of foods and dairies, at Salem will send you a list of products under restricted registration if you want it.

5. Do remember that members of

a liaison committee—working within respective fields—health, education and regulation—are constantly on the job to safeguard the interests of everyone concerned with the use of economic poisons in Oregon. This committee aims to permit agriculture the use of desirable and needed materials and at the same time guard the public against misuse and carelessness.

NEW PRODUCT "LIQUID TILE"

A "liquid tile," applied like paint, which bakes itself into a smooth, hard, waterproof surface has come on the market.

There is no known solvent for the finish it produces. This makes it ideal for walls, floors, and concrete tank linings subject to attack by acids, caustics, salt water, alcohol, grease, etc. The manufacturer says boiling lye has been poured over it without ill effect.

Called "Glascote," it is made by Ev-R-Shield Products, Inc., of Joppa, Md., from a plastic resin produced by Reichhold Chemicals, Inc. It developed from research during World War II for something to keep U.S. Navy craft from leaking and rotting.

The product can be applied with brush, spray, roller, or swab to plaster, sheet rock, concrete, brick, masonite, seasoned wood, and fiberboard. No special measuring, heating, or curing is required. It can be poured on large floor areas and spread with a long-handled white-wash brush—it is selfleveling, so that the coarsest brush marks disappear as it dries.

The makers emphasize the fact that Glascote is not a paint or enamel, but a "thermal setting plastic." It actually sinks into and becomes part of the surface. A hardener mixed into it generates a low, safe heat which literally bakes it into a tile-hard finish.

Primer and surfacer come in quarts or gallons in five colors at \$14.95 per gallon, hardner included. A gallon covers 300 to 400 square feet.

White sand or aluminum oxide sprinkled on the wet finish sinks in and produces a long-wearing, non-skid surface. Actual tests show such surfaces have greater wear resistance than steel floors.

Glascote also can be mixed with

aggregate and troweled onto areas which are eroded and cracked or which receive heavy wear and abuse. An extremely hard surface can be created by mixing in aluminum oxide or carborundum.

Absolutely poreless, the finish is not only waterproof but moisture proof. It will not conduct electricity.

The "liquid tile" was adapted from the Fiberglas lamination process used on thousands of U.S. Navy craft. The same Reichhold resins are also used on Army Arctic shelters, airplanes, guided missiles, bulletproof vests, acid tanks, fishing rods, sink tops, and bathtubs.

Glascote surfaces cannot yellow, discolor, fade, or bake down. The coloring is the same as that in ceramics and stained-glass windows. The smooth, glossy finish will not hold dust or dirt—a damp cloth or mop cleans it thoroughly.

The product can be applied directly over water-mixed paints, although oil-base paints usually must be removed because the baking action will blister them. Permanently damp walls will take Glascote if they are dried with Ev-R-Shield solvent or a blow-torch just before application. The finish cannot be used on such non-porous materials as metal, porcelain, and ceramic tile.

The resins used in Glascote have been put through rigid tests by the U.S. Government and private research organizations. The product has tensile, flexing, and compression strengths of three, six, and ten tons per square inch respectively.

U. S. OUTSTRIPS WORLD TODAY IN CLEANLINESS

Using detergents with new machines and techniques, the United States today outstrips the rest of the world in industrial cleanliness, according to William W. Niven, Jr., Midwest Research Institute, Kansas City, Mo.

Mr. Niven has estimated that some 25 pounds of "materials for attaining cleanliness" are now being used annually by and for each person in this country. Together with other experts in the field, he has assembled for the first time complete up-to-date data on detergents, methods, materials and equipment

used in industrial cleaning. Findings have been published in a book entitled "Industrial Detergency" (Reinhold Publishing Co., New York.)

"The constantly increasing per capita consumption of soaps and detergents in the United States surpasses all known records throughout the world", Mr. Niven said. "It constitutes one of the simplest and most accurate measures of the degree of a nation's development. One of the most profound testimonials to advancement of the human race is the ever increasing urge to be cleaner, personally, and to be surrounded by greater cleanliness."

Research resulting in the book was directed toward "helping people assigned in industry to meet the ever more exacting demands for cleanliness." It reveals new cleaning techniques developed in the laundry, dairy, food, beverage and textile industries. Four chapters, contributed by Howard M. Gadberry, senior chemical engineer of the Midwest Research Institute, are devoted to detergent materials, dry cleaning, dishwashing, and general industrial cleaning. One chapter, by Milo J. Stutzman, senior metallurgist at the Institute, is devoted to the metals industries.

Four other authorities contribute chapters to the book. They are Lee G. Johnston, American Institute of Laundering; Martin H. Gurley, Jr., The Duplan Corporation, Charlotte, N. C., on textile processing; John P. Greze, chief bacteriologist and sanitarian, Oakite Products, Inc., on foods and beverages; and John R. Perry, National Dairy Products Co., Inc., New York.

Summing up trends on general industrial cleaning, Mr. Gadberry states:

"More and more, management is thinking of cleaning operations as a production job. Cleaning methods are being studied and improved. Supervision is being intensified.

"Mechanized cleaning methods are increasingly improving the effectiveness and efficiency of industrial cleaning. However, there is still a great need for compact, automatic, scrubbing and rinsing equipment. Power spray and steam-detergent cleaning techniques are finding wider use in the cleaning of process equipment.

"The greater use of aluminum alloys points up the need for less corrosive cleaning compounds safe on sensitive surfaces. Neutral synthetic detergents are being employed in many cleaning jobs formerly requiring highly alkaline soaps and detergents. The nonionics in particular are being tailor made for improved detergency in both water and solvent systems.

"Practical cleaning techniques have thus far greatly outstripped fundamental knowledge about the cleaning process, but more attention is now being paid to the physical chemistry of hard surface cleaning. As a result of this increasing study of soils, surfaces, and detergents, more effective cleaners are being developed for floors, painted surfaces, and metals. Cleaners are gradually being made less irritating to the hands and less damaging to sensitive surfaces.

"Trends in general cleaning point to the use of better machines and improved detergent compounds as part of a carefully planned cleaning program to keep the plant as clean as possible at lowest cost."

MANY LEADERS ARE HONORED BY DAIRY REMEMBRANCE FUND

Since the establishment of the Dairy Remembrance Fund, Inc. one year ago, many men in the dairy industry have been honored by contributions to this fund, according to Madison H. Lewis, president. The money, from time to time, will be allotted by the board of directors to worthwhile projects, he said. Among the men for whom contributions have been made to the Fund in appreciation of their worthwhile work are:

Clyde Beardslee—Vice president of the Borden Company; associated with Merrill Soule, first company to develop powdered whole and skim milk on a commercial basis; and a member of the War Production Board during World War II with responsibility of maintaining dairy plant equipment to meet wartime needs.

Fred Flynn — Helped form the Miami Valley Milk Producers Association operating in Dayton and Springfield, Ohio; Executive Secretary of "Milk for Health" when it was organized, and milk market

administrator in several Kentucky and Ohio areas.

Dr. Carl Larson — Long associated with U.S. Department of Agriculture and Executive Director of Dairy Products Improvement Institute. He also served as Official Delegate to the International Dairy Congress for the U.S.D.A. and served as a member of the Board of Directors of National Dairy Council.

Eugene Skinner — Late chairman of the Sealright Company and former director of the Dairy Industries Supply Association.

Dr. Hugo H. Sommer — Late Professor of Dairy Manufacturing, University of Wisconsin and author of "Theory and Practice of Ice Cream Making;" he was a world known authority on many phases of dairy manufacturing and served as official delegate to the International Dairy Congress for the U.S.D.A.

Peter Trimbom — Long associated with "The Ice Cream Trade Journal" and during the last 40 years was highly instrumental in the formation of many dairy industry trade associations now in existence.

Henry N. Woolman — Executive of Supplee-Wills-Jones Milk Company; trustee of Children's Hospital of Philadelphia, and active in founding Dairy Council of Philadelphia.

Others Honored are — Oscar F. Sterling, Ted Heidenreich, J. S. Sims, Irving Koch, Donald R. Kellen and William T. Mardin.

The Dairy Remembrance Fund, Inc. headquarters are located at 111 North Canal Street, Chicago, Ill.

TO SEEK NEW USES FOR MILK

A dairy research laboratory to seek new uses for milk and help solve the surplus problem would be built by the Federal Government under legislation to be introduced into Congress shortly.

Senator Alexander Wiley of Wisconsin announced today in the February issue of Better Farming that he would soon introduce a bill authorizing funds for such a project.

The Wisconsin lawmaker said the "research I am proposing is by no means the exclusive or even the principal remedy for the total dairy problem," but it could be "an important factor in the solution."

He continued: "No other single

force holds more dramatic, far-reaching potentialities for dairymen and American agriculture than a dynamic milk-research project on a national scale.

"Research into what? I say into everything related to milk: processing, packaging, refrigeration, powdering, condensing, and merchandising. Research to combat livestock diseases, increase productivity, lower costs and improve machinery. Research, too, into human nutritional needs.

"A lot of this research is already going on, in private and public laboratories, in colleges and universities, and on experimental farms. Nowhere, though, is it proceeding with the intensity or coordination equal to the needs of our times.

"Most inadequate of all, in my opinion, is our research into new industrial uses to be gained from the chemical masterpiece which is milk. Yet it is in this field, I believe, that we will find our greatest opportunities for expansion."

FLAVORING EXTRACT MANUFACTURERS' ASSOCIATION 46TH ANNUAL CONVENTION

Mr. William H. Hottinger, Jr., of Bowey's, Inc., Chicago, Illinois, President of the Flavoring Extract Manufacturers' Association of the United States, announces the 46th Annual Convention will be held at the Edgewater Beach Hotel in Chicago, beginning with the hospitality and cocktail hour on Sunday afternoon, May 22.

Business sessions will begin on Monday morning, May 23, and continue up to and including May 25.

Many outstanding speakers will address the Convention on various subjects of importance to the membership, and a symposium will be conducted by the Scientific Research Committee of the Association on various matters of interest to the membership all of Tuesday afternoon May 24.

Mr. E. N. Heinz, of Food Materials Corp., Chicago, is Convention Chairman, and Mr. C. Christenson of Charles Pfizer & Co. is in charge of entertainment.

BILL O'BRIEN PASSES ON

William J. O'Brien, CP Chicago Branch Supervising Engineer for Refrigeration, suffered a heart attack on February 24 and died Monday night, February 28, at Lutheran Deaconess Hospital, Chicago. He was 78 years old.

He is survived by a daughter, Mrs. Violet Delano of Chicago; and two grandchildren: Mrs. Carol Dempsey and William Delano, an Erecting Engineer for CP Chicago Branch.

"Billy" O'Brien started work with CP 57 years ago in 1898 when The Creamery Package Mfg. Company acquired A. H. Barber and Company. He had installed CP refrigeration and ice making plants in Mexico, Canada and throughout the United States. He had a host of friends who knew him for his unequalled experience and practical refrigeration knowledge—but most of all, they knew and will remember him as a good natured friend with a twinkle in his eye and a cigar in his mouth.

MILK CAN INSTITUTE TAG PROGRAM

Under the direction of The Milk Can Institute, the new "Quality Tag" program is now getting under way, with copies of the top quality milk tag being offered to the more than 19,000 dairies in the United States free of cost through the Institute. Purpose of the tag is to mark cans received by the dairies from their suppliers which are in sub-standard condition, and to call the cans to the owners' attention even though they still are capable of meeting inspection by sanitary and dairy inspectors.

Copies of the green and black tag referred to can be secured directly from the Milk Can Institute, 2130 Keith Building, Cleveland 15, Ohio, without cost, simply by requesting the number of tags necessary to take care of marking marginal cans received by any dairy from its own milk shed area.

"FOOD FOR LIFE"

The importance of milk and milk products in balanced diets for health and happiness is told in the new "Food for Life" exhibit now open at the Museum of Science and Industry in Chicago.

The world's largest nutrition ex-

hibit, "Food for Life" tells museum visitors how to eat nutritionally balanced meals and describes the benefits of them.

All types of food are featured in the exhibit which outlines the basic story of nutrition from soil, through plants and livestock to man. The major sections are devoted to the role of agriculture, the food processing, and the wholesale and retail distributing industries in providing nutritious foods.

John Holmes, President of Swift & Company, said the company is sponsoring the exhibit because "We want to do our part in helping to make ours a nation of vigorous healthy people."

Milk, ice cream, cheese and other milk products are one of the seven basic food groups needed for nutrition. In table settings, other pictures and animated sections of the exhibit, viewers are made aware of the place of these foods in human diet.

There are also living examples of good nutrition in the "Food for Life" exhibit. An animal nursery containing well-fed baby pigs, lambs, and ducklings cavorting in pens is the appealing climax to the nutrition story. And too, a glass-enclosed incubator enables viewers to witness baby chicks pecking their way out of the eggs.

From youngsters to grandparents, the "Food for Life" exhibit pictures the contribution of each nutrient to the body and the roles of individuals and industries in getting these nutritious foods into the kitchens of our homes.

SALES APPOINTMENT

John Dow, of Sacramento, California, has been appointed sales engineer for Mojonner Bros. Co., well known manufacturers of dairy and food processing equipment. John will cover the northwest Pacific territory, including Utah, Idaho, Oregon, Washington, Wyoming and British Columbia, Canada. He has ten years' experience as a Dairy Engineer for Golden State, Ltd., San Francisco, California, as well as other varied experience gained in the west coast area. His familiarity with this part of the country, coupled with a demonstrated ability in dairy and food engineering should provide much valuable help to the growing list of Mojonner customers in this area.

"CHILDREN WHO CAME ALIVE" —Dry Milk Achieves a Small Miracle

There's a thrilling true story in February McCall's, of tremendous significance to the entire food industry. This is an excellent report, in language every mother can understand, of the child feeding studies by Dr. Tom Spies and his dedicated workers at the Nutrition Clinic, Hillman Hospital, Birmingham, Alabama. The American Dry Milk Institute implemented this study by supporting it financially and with needed supplies of non-fat and whole dry milk over an eight year period. It is another significant step in the program of the American Dry Milk Institute to educate our nation to the value of non-fat dry milk solids.

Where children are concerned, the whole world is responsible. Certainly, the more than 4,500,000 readers of McCall's will be irresistibly drawn to the story by Marguerite Clark entitled "Children Who Came Alive . . . were dangerously undernourished until dry milk achieved a 'small miracle'."

Its ultimate influence is immeasurable, but all those who have been concerned with the studies, who have seen the heart-warming results, are hopeful that it may be the means of effecting many 'small miracles', building good citizens, and bringing health and happiness to future generations.

CANCO ANNOUNCES FORMING OF NEW PRODUCTS DEPT.

To intensify its development of new uses and broader outlets for metal and fibre containers American Can Company has formed a "new products" department, it was announced by William C. Stolk, president.

He said that Roscoe M. Roberts, formerly general manager of the company's closing machine department, had been named general manager of the new department.

Mr. Stolk said the new department in its product and market development work will coordinate a number of functions that previously have been carried out by other departments in the company.

"Formation of the new department is an extension of Canco's

basic policy of expanding through creation of new markets rather than depending upon a greater share of existing markets," Mr. Stolk said. "A large part of the company's current business results from development by our people of markets for containers for such products as beer, milk, soft drinks, motor oil and frozen concentrated juices."

Mr. Roberts, general manager of the department, has been with Canco for 33 years. He spent 28 years of that time in sales activities. He joined Canco in 1922 as a clerk in the Chicago sales organization.

He spent two years as chief clerk in the research department in Chicago, and in 1924 was transferred to New York where he held various sales jobs leading to his appointment in 1941 as Atlantic division sales manager. Mr. Roberts returned to the general sales department for three years before his promotion in 1950 to general manager of the closing machine department, the position he held until his present appointment.

INTERESTING FOUR PAGE BROCHURE RELEASED ON EXCLUSIVE BUSINESS PROMOTION FOR DAIRIES

An interesting and colorful four page brochure is being offered to dairies under the title of "A Unique Sales Approach for Dairies".

The brochure talks about a new, different, entertaining and educational business development tool for dairies which can be utilized as year-round business promotion and especially tie in with June — "Dairy Month".

The brochure completely outlines this new dairy promotional opportunity which consists of a new series of "Child-Brite Books" in which are included special verses that tie in with dairy products.

Typical verses in the books on dairy products are titled: Milk; Ice Cream; Moo-Moo, The Cow; The Sour Cream Ride, etc. The verses are highly illustrated.

While the special tie in with dairy products is unique and represents a first opportunity for dairies, the series of "Child-Brite Books" appeal to dairy customers and prospects through their children,

The four page brochure provides complete details, not only on the books, but also the uses to which the books can be put. Furthermore, there is an outline of the cost of the books which are inexpensive and being offered to dairies on an exclusive basis in towns and areas served by dairies. The assignments of the exclusive arrangement will be on a first come, first served basis.

Without any obligation, write today for a copy of the brochure to: Damer Publishing Corporation, 22 West Madison Street, Chicago 2, Illinois.

DAIRYMEN CITE FOUR COMPANIES FOR SERVICE TO INDUSTRY

Awards were presented by the dairy farmers of the nation to four companies in recognition of outstanding service to the dairy industry during the past year. The citations were presented during the annual meeting of the American Dairy Association which closed here Wednesday, March 23rd.

Distinguished service awards were presented to the Kitchens of Sara Lee, Inc., Chicago; the Ralston-Purina Company, St. Louis, Missouri; Walt Disney Productions, Hollywood; and the American Broadcasting Company, New York.

Charles W. Lubin, president, accepted the award for the Kitchens of Sara Lee. The baking company was cited for "their major role in proving that prestige bakery products are desired by consumers and that business enterprises may establish and build themselves on the basis of high quality products at a higher price." The company specializes in cakes made with dairy products. In four years the distribution of the cakes moved from the Chicago area alone to 31 states.

The Ralston-Purina Company award, accepted by Ray E. Rowlands, executive vice president, recognized the organization for its cooperative merchandising efforts with the dairy industry, for promoting milk at farm meetings and for research work which "has made important contributions to the scientific proof that the dairy cow, as the chief ruminant, is a prime converter of grass and other roughage for human consumption in the form of milk, nature's most nearly perfect food."

The awards to Walt Disney Productions and to the American Broadcasting Company were based on the production of the Disneyland television show, of which the American Dairy Association is one of the sponsors. Disney was praised "for creating and bringing to the American public the Disneyland television show . . . a new concept in television. The show entertains, it educates. It has vast attraction for young and old alike and brings families together on a common meeting ground." The ABC network was cited for its "foresight in bringing the Disneyland show to the public."

The American Dairy Association promotes the sale of all dairy foods on a non-brand basis. The program is financed by dairy farmers in 44 states.

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Send to: IAMFS, Box 437, Shelbyville, Indiana.

HOLD MEETING IN CHICAGO

Continued from Page 107

Corp., told the assembled delegates. Particular emphasis is now being placed upon increasing the shelf life and refrigerator life of food, as well as making a wider variety of package foods available.

Parker Frisselle, manager of market research for Dow Chemical Co., discussed the role of chemicals in packaging and preserving foods. A billion dollars a year of food is lost, he said, due to spoilage and related causes before the food reaches the consumer. The availability of proper preservative chemicals, he declared, could overcome these losses. Dr. Henry E. Kraybill, director of the American Meat Institute Foundation, outlined the various chemicals used in the meat industry. He pointed particularly to the recent growth in the use of antioxidants in fats, with several of these materials approved for use.

In the morning symposium on "Chemicals and the Feed Industry," Tom Brinegar, vice president of Feed Age Magazine, said chemical products are rapidly increasing in both number and importance in manufactured animal feeds. He said that many products originally developed for humans have been found beneficial for food animals—and urged his audience to re-examine many products "on the shelf." As an example, he cited niacin, today an important ingredient of modern swine and poultry diets.

Dr. Roger P. Link, of the University of Illinois, said that the chemical industry can greatly help veterinarians to overcome disease losses in food-producing animals, which losses amount to hundreds of millions of dollars annually. "What we need most," he said, "are effective therapeutic agents for virus, rickettsial and fungal diseases and certain parasites." Dr. G. P. Whitlock, of Merck and Co., also addressed the morning session on "Vitamins and Growth Factors."

The evening meeting of the CCDA and CMRA heard Dr. Samuel H. Work, of the Food and Agricultural Organization, speak on "The Organization and Activities of the Food and Agriculture Organization of the United Nations."

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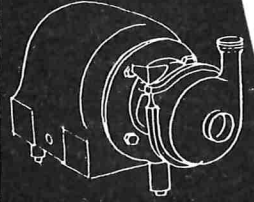
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QUESTIONNAIRE FOR INFORMATION ON VOCATIONAL DATA OF MEMBERSHIP

Dear IAMFS Member:

Your association and the Journal of Milk and Food Technology has steadily grown in stature over the years. Beginning with January 1954, the Journal was issued monthly. In order to continue this and to increase the size and scope, it is necessary to increase our advertising volume. Prospective advertisers have informed us that they need additional information relative to the professional activities, employment and other general data of our membership. We would therefore appreciate it if you would fill out the following questionnaire to the best of your ability and send it to H. L. Templeton, Chairman, Membership Committee, 6125 Florence Blvd., Omaha 11, Nebraska. The material you submit will be held completely confidential. In addition, we would appreciate having any comments you wish to make.

Very truly yours,
H. L. Templeton, Chairman
Membership Committee

QUESTIONNAIRE

1. Which of the following occupational groups would you say you would fit? (You may answer more than one category.)

- Attorney
- Bacteriologist
- Chemist
- Consultant
- Educator
- Engineer (general)
- Farmer
- Food Processor
- Laboratory Technician
- Librarian
- Manufacturer of Food Equipment
- Manufacturer of Milk Equipment
- Milk Processor
- Physician
- Publisher
- Sanitarian
- Sanitary Engineer
- Student
- Veterinarian
- Other

2. How many of the following do you visit each year?

- Barber Shops _____
- Butcher Shops _____
- Dairy Farms _____
- Food Plants (excl. milk) _____
- Groceries _____
- Hotels _____
- Lodging Houses _____
- Milk Plants _____
- Nurseries _____
- Restaurants _____
 - Drug Stores _____
 - Soda Fountains _____
- Schools _____
- Sewage Disposal Plants _____
- Tourist Homes _____
- Trailer Camps _____
- Water Works _____
- Other _____

3. Milk Sanitation

- a. Approximately how many cows are there on the farms under your supervision? _____
- b. Approximately how many milking machines are there on these farms? _____
- c. How many farms are now under the bulk milk pickup system? _____
- d. What is the total production of the farms? plants? under your supervision? _____
- e. Are the plants filling bulk milk dispensers? _____
How many? _____

4. By which of the following agencies are you employed?

- a. Government Agencies -
 - Federal State
 - Civilian City
 - Military County
- b. Educational Institutions -
 - University or College
 - High School
 - Federal, State, or City
 - Industrial
- c. Laboratories -
 - Official agency
 - Commercial or industrial
 - Institutional
- d. Industry -
 - Milk and milk processing plants:
 - Receiving stations
 - Evaporating plants
 - Dry milk plants
 - Ice cream plants
 - Fluid milk plants
 - Cheese plants
 - Butter plants
 - Butter
- e. Other

5. Automatic Vending Machines - How many of the following are under your jurisdiction?

- Carbonated and non-carbonated beverage _____
- Coffee _____ Sandwich _____
- Milk _____ Other Foods _____
- Soup _____ Other _____

6. For statistical information, please indicate size of the city or place in which you have your residence. (If a suburb, check size of city of which it is a suburb.)

- Over 1,000,000 (in the United States, only New York, Chicago, Philadelphia, Los Angeles, Detroit) _____
- 100,000 to 1,000,000 _____
- 25,000 to 100,000 _____
- 2,500 to 25,000 _____
- Under 2,500 (non-farm) _____
- Farm _____

7. Please write in the state in which you have your permanent residence _____

8. Please furnish the following information relative to the car you drive.

- Make Year _____
- Miles driven per year _____

9. Do the advertisements in the Journal of Milk and Food Technology help you in your work? Yes No

10. Comments:

.....
.....

JOURNAL OF MILK AND FOOD TECHNOLOGY

INSTRUCTIONS TO CONTRIBUTORS

Manuscripts.—Manuscripts should be submitted on suitable 8½" x 11" paper. The original type-written copy double or triple spaced with wide margins not less than 1" on all four sides should be submitted. Tabular material and illustrations should accompany the manuscript; also, each manuscript should be accompanied by (a) a glossy personal photograph of the author, (b) a brief biographical sketch of the author not more than 50 - 75 words, and (c) an abstract of the paper not to exceed 75 words. These will be used at time of publication of the paper. All material should be sent by first class mail in flat form to the Managing Editor, H. L. Thomasson, P. O. Box 437, Shelbyville, Indiana.

Authors should make every effort to present their material accurately and in a clear and concise form. In preparing manuscripts, use of the first person should be avoided. Manuscripts should be proofread carefully before they are submitted. Each manuscript will be reviewed by one or more Associate Editors. Anonymity of reviewers will be **preserved**.

Manuscripts reporting the results of experimental work, generally, should be divided into sections, for example: Introduction; Experimental; Results; Discussion; Summary and Conclusions; References.

Figures, Tables and Photographs. — Tables should be clear and concise. Excessively large tables, as well as those consisting of only one or two lines, should be avoided if possible. Headings should be brief but fully descriptive. Avoid presenting the same data in a table and again in a figure. Place each table or figure on a separate sheet—not in the body of the manuscript.

Figures consisting of drawings, diagrams, charts and similar material should be done in India ink on 8½" x 11" tracing paper or cloth. A lettering guide should be used for all written material on figures. Submit original figures rather than photographs of such figures.

Photographs should be glossy prints free of imperfections.

Legends. — Legends for figures and photo-

graphs should be typed on a separate sheet. The legends should be brief but fully descriptive.

References. — References should be double spaced and arranged alphabetically as to authors. References to papers by a single author should precede references to papers by the same author and associates. References to papers by multiple authors should be listed in the alphabetical order of the several authors. Initials rather than the full first names of male authors should be given. Reference citations in the text should be made by a number in parentheses, corresponding to that number in the reference list.

Sample of journal citation: (1) Mallmann, W. L. Sanitation in Bulk Food Vending. *J. Milk and Food Technol.*, 16: 267-269. 1953.

Sample of Book citation: Adams, H. S. *Milk and Food Sanitation Practice*. The Commonwealth Fund. New York, New York. 1947.

Sample of Experiment Station publication citation: Watrous, G. H., Doan, F. J. and Josephson, D. V. Some Bacteriological Studies on Refrigerated Milk and Cream. *Penn. Agr. Exp. Sta. Bull.* 551. 1952.

Publications should be abbreviated according to the form given in CHEMICAL ABSTRACTS, vol. 45. no. 24, part 2. 1951.

Abbreviations.—Common abbreviations to be used in the text are: cm., centimeter(s); cc., cubic centimeter(s); C., Centigrade; F., Fahrenheit; g., gram(s); log., logarithm; lb., pound(s); μ , micron(s); μ g., microgram(s); mg., milligram(s); ml., milliliter(s); oz., ounce(s); sp. gr., specific gravity.

News items and announcements. — Items of general interest should be submitted in the same manner as indicated for manuscripts. An informal writing style is preferred. News of the activities of affiliate associations, members and events is particularly desirable.

Letters to the Editor.—Letters to the editor are encouraged. Letters should be addressed to the Managing Editor and must be signed by the writer. Excessively long letters should be avoided due to Journal space limitations.

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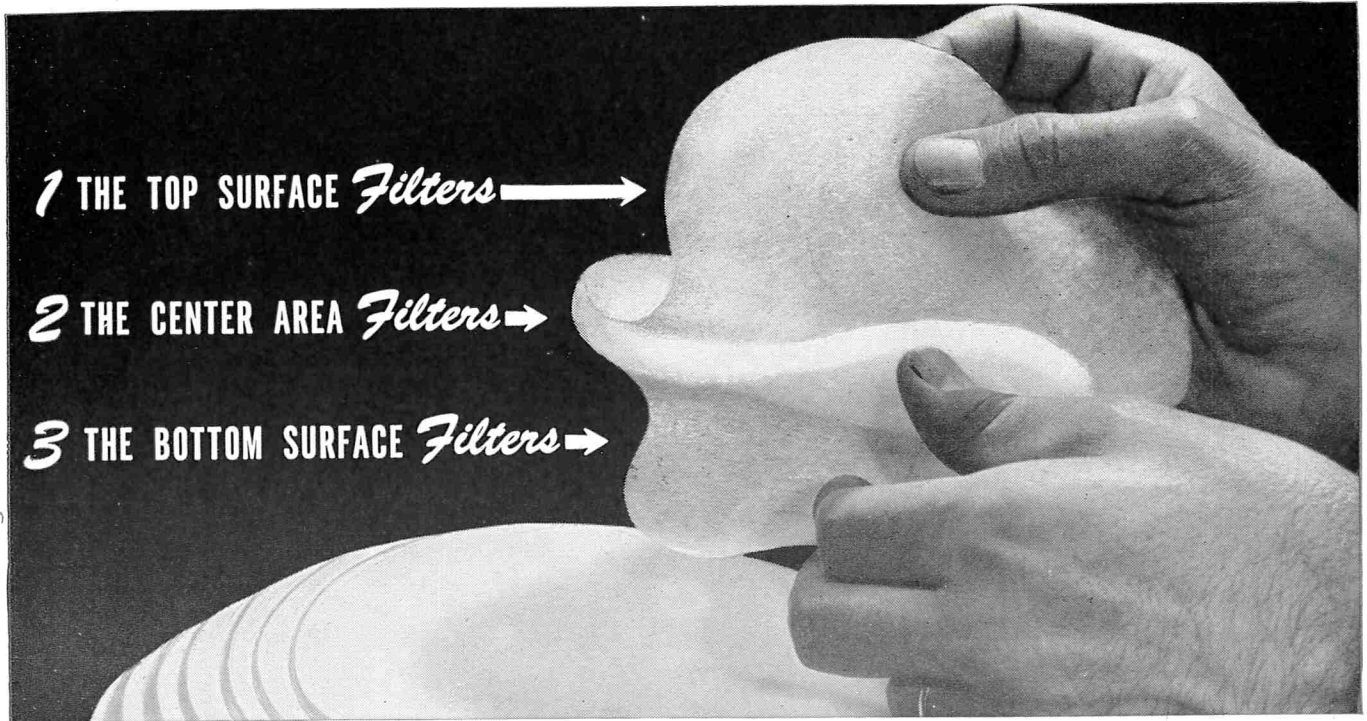
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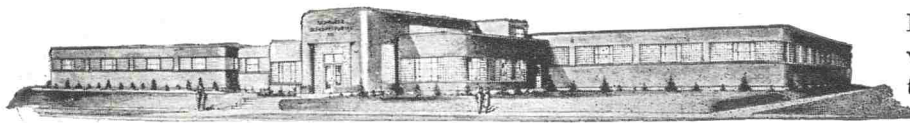
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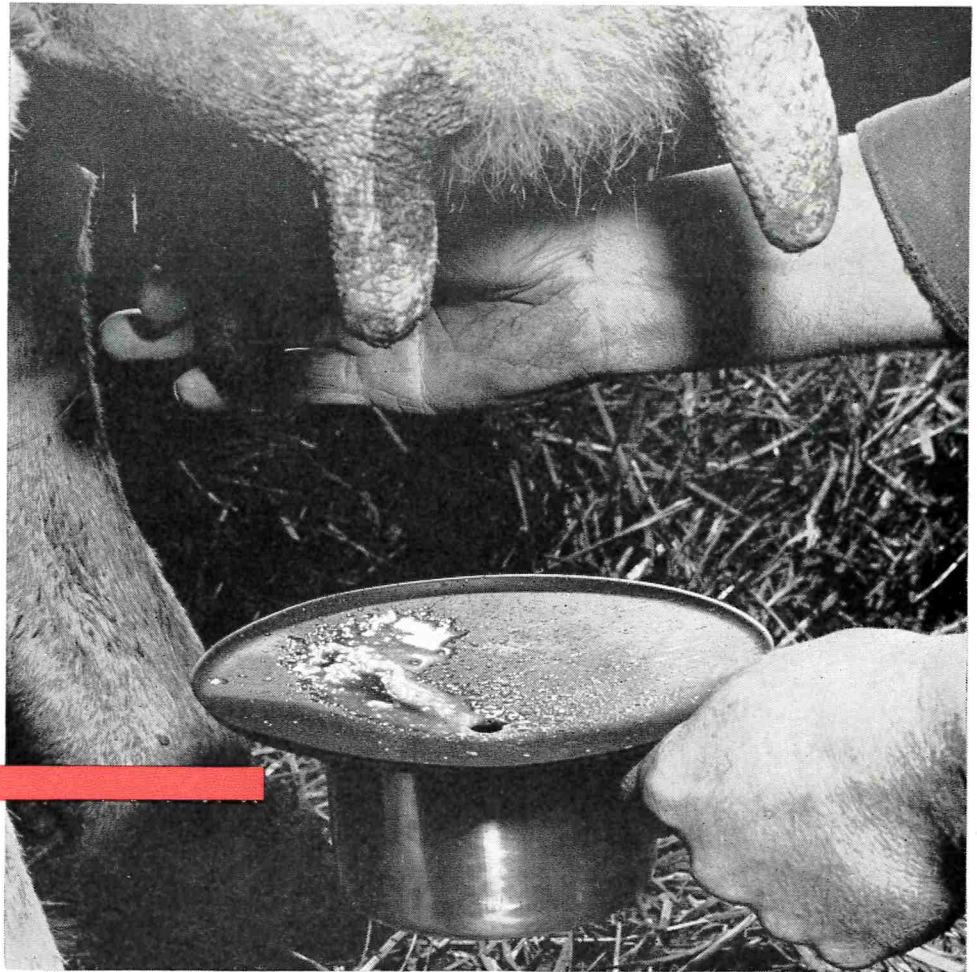
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