VOLUME 19 No. 7
JULY, 1956

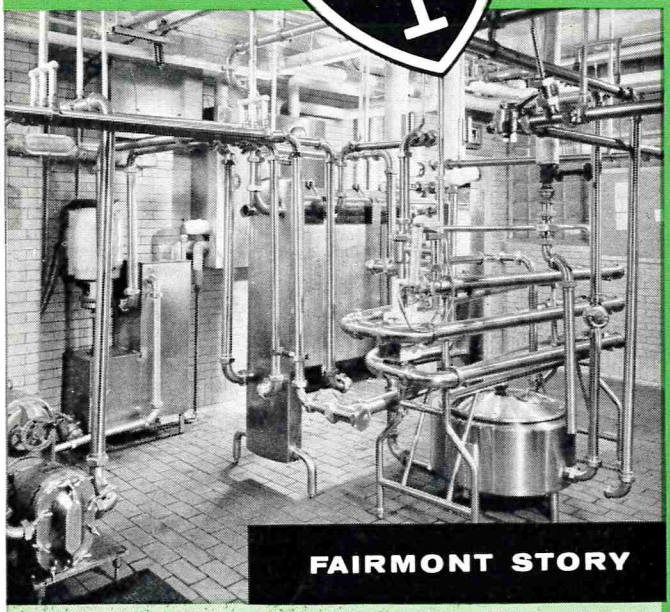
Journal of

MILK and FOOD TECHNOLOGY

Official Publication

International Association of Milk and Food Sanitarians, Inc.

GREEN BAY goes CRESCENT



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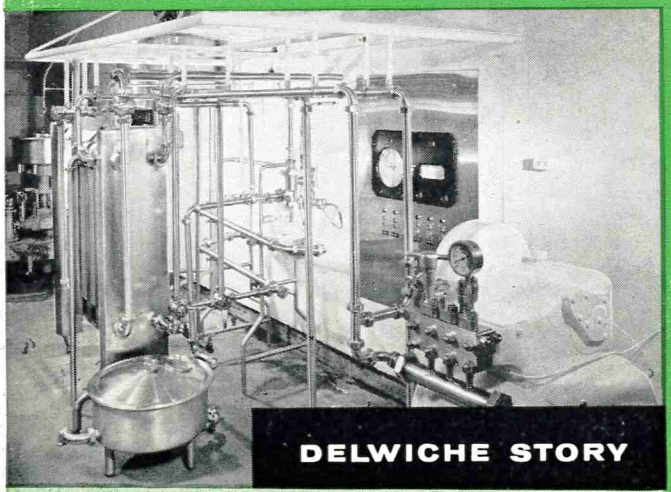
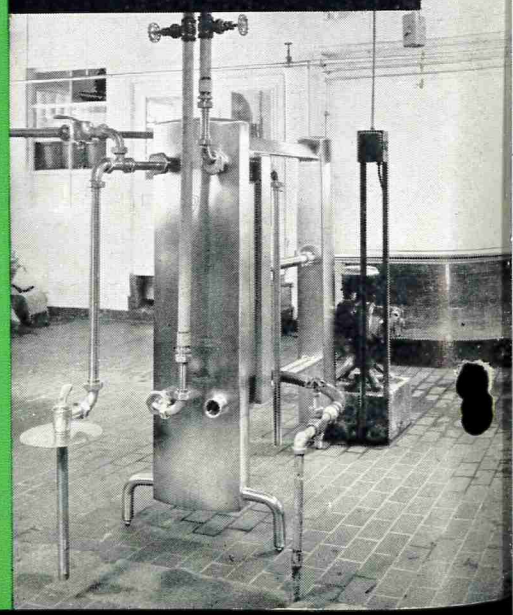


DELWICHE STORY

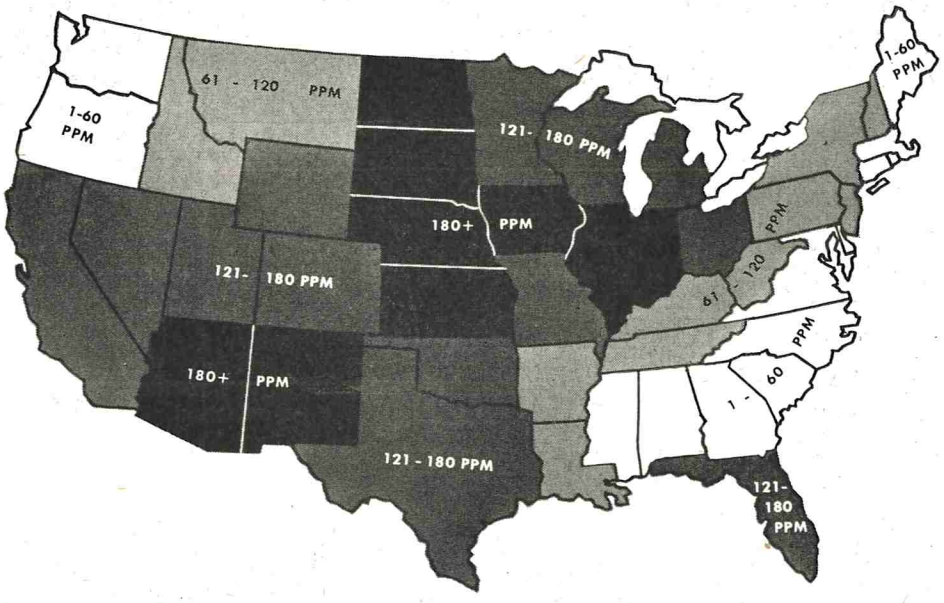
4,500 pounds per hour H.T.S.T. This customer (Delwiche Farms, Inc.) needed an H.T.S.T. unit to reduce operating cost and meet additional production requirements. They chose CP Crescent to meet present and future needs.

4,000 pounds per hour Pasteurized Milk Cooler. This customer (Hansen's Dairy) needed a plate type pasteurized milk cooler. Next step will be H.T.S.T. They chose CP Crescent.

HANSEN STORY



For the entire Crescent story, write for Bulletin E-1153, or see your local CP representative.



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ACTIVITY IN RETIREMENT

Editorial Note: Believing that his many friends within the Association membership would be interested in the activities of Dr. Shrader since his retirement as Editor of the Journal we asked him to render an "accounting." Here it is in his own immitable style.

In reply to your recent request, I am complimented that you think that "what you have been doing this past year" would interest the membership. I cannot very well find an excuse for not complying with your request, so I am jotting down in an informal sort of way a brief account of some of my activities—for you to blue-pencil *ad lib.*

Dairy farmer. Now that I am living in Vermont, I observe at first hand the economic plight of the dairy farmer. It certainly does not seem "fair," to say the least, let alone sound economic and national policy, that the producer should have to take the squeeze by being at the bottom of the economic heap. In the present setup, it looks as if the easy and immediate relief would be an increase in the price of milk.

This is bad. First, it would penalize the consumer (who has enough to bear already): second, it probably would decrease the consumption of milk to a degree; and third, it salves a wound rather than effects a cure in other words, it would be a temporary expedient rather than a long-time stabilizing one). Therefore it seems to me that we must seek a solution which possesses elements of permanence. Since the milk industry has not changed its practices over the past fifty years or so, it may be necessary to institute rather revolutionary (maybe that is too strong a word) measures. The weak economic spot in the whole setup seems to me to be in the matter of distribution, and of course also, transportation. The cost of handling all that water seems to be anachronistic. The public might be willing to adjust to this in view of the readiness with which they have accepted instant coffee, concentrated soups, concentrated fruit juices, ready-mix flour, etc. I am poking around to ascertain to what extent technological advances have been made in concentration (and powdering) procedures that might be applied — e.g. freezing, evaporation, etc.

Rational religion. My teaching of science in a church-related college has led me to face up to a lot of questions that youth asks. They want to know the "why" of a lot of things that conservative (and adult) religionists take for granted. Answers in the terminology of current thinking have not been adequate to meet the need of a "warm-hearted" and at the same time, intellectually satisfactory outlook. So I have been ascertaining the extent to which I can express the whole structure of religious doctrine (Christian and non-Christian) interms of reasonableness and yet retaining the faith characteristics of a transcendent world. This has led to my issuing a quarterly mimeographed *Newsletter on Religious Inquiry* which has grown from a little circular letter to a small discussion group, to over two hundred persons all over this country and some abroad, as the word is passed along from person to person.

Research in sociology. Out of the foregoing inquiries has arisen an increasing concern regarding America's place in the present world tensions. The respect and concern that Washington expresses for spiritual values does not seem to be reflected in our diplomatic practices. We give lip service to the power of the pen versus that of the sword, and we seem to extol the value of ideas — but such pious pronouncements seem to be lost in the rumble of tanks, jet planes, nuclear blasts, and war-threats — and taxes keep up of course, while half the world is starving and our warehouses carry food to the tune of over ten billion dollars. Ye gods, the end is not in sight.

So, in order to be constructive in my criticisms, I have become impressed with the findings of the Research Center in Creative Altruism at Harvard University under Professor Sorokin (he used to be the private secretary of Kerensky who overthrew czardom and in turn was thrown out by the Bolsheviks under Lenin). These data, added to what I am digging up in my studies in comparative religion and the natural basis for morals, has led me to postulate that a world organization along the lines of creative altruism would furnish a ground where all the peoples of the world could meet as honest-to-goodness human beings that are not muzzled, etc., by the distortions of official protocol professional positions to maintain in religion and politics, and prejudices of racial and economic nationalism. The above organization finds that the positive, helpful qualities in human nature are certainly at least as interesting and constructive as are those of criminology, delinquency, perversion, etc. I should think that people ought to know how to emulate the one as well as to avoid the other.

I've gotten a group of prominent persons to team up, forming the new Research Society for Creative Altru-

ism. The president is Dr. Igor I. Sikorsky (the airplane manufacturer at Bridgeport, Conn.) and others from Mass. Inst. of Tech., Harvard, Yale, Brandeis, Boston Univ., etc. This organization will endeavor to establish the dependability and public verifiability of a ground that would provide a basis for union of spirit in such a diverse body as the United Nations (which is held together only by fear) — and we all know that fear is not constructive. Etc. They want me to edit their journal when it starts.

Teaching, writing, etc. I am still Chairman of the Division of Science and Professor of Chemistry, teaching an advanced course in Chemistry and administering the affairs of our growing Division of Science (involving the construction of a new building).

I do a lot of writing letters to the public press, some articles as above, etc.

Although I spend a lot of time on the train (once in a while by airplane) between Waterville and Wollaston, I use the time to good advantage by getting a lot of reading done.

My health is excellent. I feel as fine as I ever did — only I get tired sooner than I used to.

A hearty HELLO to everyone.

J. H. Shrader

FORTY-THIRD ANNUAL MEETING
HOTEL OLYMPIC — SEATTLE, WASH., SEPTEMBER 5, 6, 7, 1956

DEVELOPING FOREIGN FARM MARKETS FOR DAIRY PRODUCTS[1]

C. J. Babcock

Foreign Marketing Branch, Dairy and Poultry Division, Foreign Agricultural Service, U. S. Department of Agriculture, Washington, D.C.

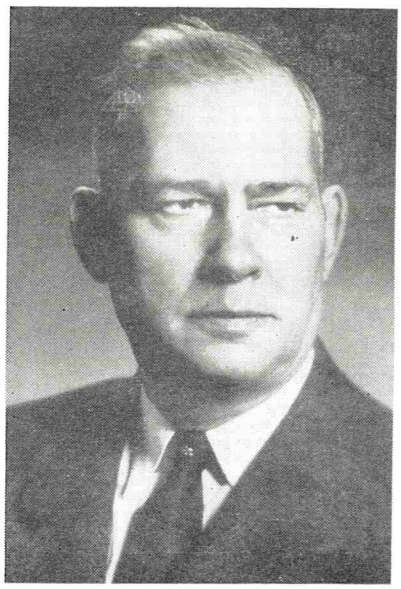
Never before has American agriculture looked abroad as much as it is today. Its major segments and related industries are becoming aware of the importance of export markets for the commodities which we produce in excess of our needs. The dairy industry needs to develop foreign markets, for except as brought about by war conditions, dairy products, volume-wise or value-wise, have constituted only a very minor portion of our total agricultural exports. In 1939 in terms of whole milk equivalents, we exported only 183,000,000 pounds or 0.2 percent of our total production. This increased in 1940 to 472,000,000 pounds or 4 percent of our total production. The upward trend due to World War II began in 1941 and reached a peak of 6,645,000,000 pounds 5.6 percent of the total milk produced in 1944. Exports continued at a high rate through 1947 after which they declined, and in 1952 only 676,000,000 pounds or 0.6 percent of the total milk production was exported.

The preliminary figures for 1954 indicate a substantial increase over 1952 in our export markets. During this year, 2,034,000,000 pounds or 1.6 percent of the entire milk production was exported. However, more than two-thirds of these exports were relief programs and the remaining third contained sales of some products at extremely low prices for child-feeding and similar uses. Therefore, practically no gain has been made in the commercial export of dairy products at a time when export outlets are seriously needed if we are to have a firm production economy.

For many years, the United States dairy industry has promoted the sale at home of its own products and various brand names without unified effort to expand foreign markets. Now, however, there are a few signs that the industry is beginning to see the necessity of directing its energies more cooperatively and, with government assistance, of moving forward and achieving for itself a fair share of world trade.

The Foreign Agricultural Service of the United States Department of Agriculture is directly concerned in this cooperative movement and is attempting to smooth the path for foreign sales of dairy products and other agricultural export commodities. It is emphasized that it is the Service's purpose and function to work with and help private business overcome foreign trade obstacles which limit exports. We do not do any actual selling, preferring to see private enterprise sell, as well as own and handle, the nation's dairy products. Our representatives, however, are working to create new business and point to market opportunities abroad so that private firms already engaged in foreign sales or desiring to engage in such sales can expand their operations.

Before discussing the problem we are encountering, some of the ways in which we hope to aid the industry in expanding export markets should be mentioned. One of these is working with the industry and foreign



C. J. Babcock, Chief, Foreign Marketing Branch, Dairy and Poultry Division, Foreign Agricultural Service, has been with the Department of Agriculture over 30 years in research pertaining to quality of milk and milk products, formulation of standards for dairy products and in present position for slightly over one year. Author and coauthor of many technical publications, he received the B.S. degree in Agriculture from Ohio State University. Mr. Babcock served with the Chemical Warfare Service, U.S. Army during World War I. During World War II, he served as Officer in Charge of Milk and Milk Products Inspection, Office of the Surgeon General, U.S. Army, and was awarded the Legion of Merit.

[1]Presented at the 42nd Annual Meeting of the International Association of Milk and Food Sanitarians, Inc., at Augusta, Georgia, October 4-6, 1955.

governments in removing such road-blocks to foreign trade as trade restrictions, foreign exchange and discrimination against our products. Another is providing dairy exporters and importers with firsthand information on market situations and trade opportunities. The third is bringing American exporters and foreign importers together under conditions favorable to trade. In addition, we will analyze and interpret international commodity and trade information useful to the American dairy industry and furnish comprehensive appraisals of foreign production and competition.

An important aspect of our foreign market promotion consists of firsthand studies made abroad by our marketing specialists, whom we send continuously to various parts of the world to explore market possibilities and report their findings to the American agricultural interests concerned. Some of you may have seen our reports covering studies of dairy products. A few important points are as follows:

In developing world markets for United States dairy products, it is essential to know (1) the composition standards for these products as they are manufactured in the countries to which we desire to export, and (2) the export, import and domestic quality standards of all dairy products not only in the importing countries, but in competing exporting countries, as well. It also is essential to have information regarding the manufacturing procedures, application of grades, export markets and available prices in the competing countries.

A survey of the dairy industry in Western Europe revealed that in all major dairy exporting countries, and in some of those where dairy exports are not a major factor, definite export grades have been established. With one exception—a minor dairy exporting country—the grades assure that only top-quality products will be exported. All grades are rigidly applied. The exporting countries make detailed studies of the export markets and the requirements of the markets. Based on this information, the products are tailored to meet the desires of the importing countries. It was also learned that the same quality milk is used for all dairy products. By comparison with the United States requirements for milk for fluid use, the raw milk requirements are low. By comparison with the quality of raw milk received for manufacturing purposes in the United States, several areas compared quite favorably. It was also noted that throughout this area the belief is quite general that the United States can not, or at least does not, manufacture butter and cheese of good quality. Such a belief must be corrected.

A survey of the market for dairy products in the Far and Middle East showed that a great potential market exists in these areas that cannot possibly be filled within the foreseeable future by local production. In this area, butterfat is utilized mainly as ghee and if we are to place a United States product on this market, it will be necessary to tailor our export to the commercial desires of the area. The actual processing procedures used in the manufacture of ghee and ghee-type products, and the consumer preference as to color, taste and body and texture of this product were therefore determined. The information was made available to the United States dairy industry and cooperative efforts between the Dairy and Poultry Division of the Foreign Agricultural Service and interested firms resulted in a United States manufactured ghee acceptable to the consumer in the Far East. There is great interest in the shipment of American made ghee both by United States exporters and by Far Eastern importers. To date no commercial shipments have been made, but we believe that in the near future the remaining problems, such as price, will be solved and ghee will move into these markets. It has great potentials for disposing of surplus butter and as a future market. It was also established that recombined milk, utilizing high quality anhydrous milk fat and low-heat, spray process nonfat dry milk solids will be the most feasible means of supplying a safe, palatable, nutritious milk for these areas. Some recombining operations have been established and we are working on proposals to establish several more.

In attempting to obtain our rightful share of the world dairy export market, we have avoided entering traditional markets of friendly nations. The Western Hemisphere is historically and logically a United States market. We have, therefore, made surveys in the Caribbean and Central American areas and in parts of South America to determine the feasibility of supplementing their normal milk supplies, especially during the season of short supply, with recombined milk and the further utilization of United States dairy products on these markets. In some of these areas, milk production may drop as much as 40 to 50 percent during the dry season. This fluctuation in consumer supply is a great detriment in maintaining a consistent consumer level of consumption. The recombining of milk was demonstrated in plants in Latin America and shown to be a means of maintaining the normal consumption, and thereby obtaining a gradual overall increase in the consumption of milk and dariy products.

In countries in these areas where the seasonal fluctuation in milk production is not great, the per-capita availability of milk based on United States standards is still low. Most of the existing markets in such countries could beneficially supplement their normal supplies by the introduction of recombined milk.

During visits to foreign countries, information is also obtained with reference to the quality and retail

prices of domestically manufactured dairy products and the quality, packaging and prices of imported dairy products appearing in the retail stores. Latest information is obtained on the quantities of dairy imports and the countries of origin.

We have noted in assisting in the development of increased export markets for U.S. dairy products that handicaps do exist.

In many areas, due to the high retail prices and the low average income of the masses, the possible market for surplus United States dairy products, is for less than carlot quantities. This creates a problem because we are competitive with world dairy prices only on the basis of Commodity Credit Corporation export prices for carlot shipments. This means the exporters must make special efforts and combine several small orders so they can purchase on a carlot basis from the government. However, the potential market for milk and dairy products in the Central and South American countries and the Far and Near Eastern countries is such that it is well worth every effort to supply the present demands even though they may be small. In that way United States products will be well established in these areas when the potential market fully materializes.

A second handicap is the lack of U.S. export grades for dairy products. As previously stated, our major competitors on the world dairy market have export grades applied either by the government or voluntarily by the industry under rigid control. In addition, the products bear an emblem or insignia designating the country or origin. Company brands also appear on the exported products. It would be definitely advantageous to have United States export grades and a symbol associating the product and grade with this country. Neither the grade nor the symbol would be detrimental to established brands. They would be beneficial not only to companies having etsablished brands but to the overall United States dairy industry. As an example of the necessity for such grades, importers of large quantities of United States butter from government stocks have difficulty with the non-uniformity of color of this product. Unless lots of butter are sorted by color, a mottled butter results when the bulk butter is printed. Even if the lots are sorted by color, color variation of United States butter appearing on foreign markets hinders its acceptance. The major exporting countries export butter of uniform color, and color is a part of their export standards.

The United States is the only major butter producing country that does not have a 16 percent moisture standard. With but one exception, all foreign made dry whole milk noted on export markets is a 28 percent fat product as compared to 26 percent for the United States product. Other examples could be given, but these point-up that export grades are necessary and would assure uniform quality. A national symbol would establish in the consumer's mind that such quality is from the United States. We offer our full cooperation to the industry, in developing United States export standards and insignia. We will then work with other nations for uniform world-wide standards.

It has been mentioned that we are attempting to remove trade barriers which affect United States exports. The existence and form of trade barriers is an interesting story in itself but will be mentioned only briefly here. To prevent an acute dollar shortage, a number of countries find it impossible to continue to import our products much in excess of their exports to dollar areas. Such countries adopt import restrictions, that is, they refuse to issue import licenses; impose high import duties, and make dollar exchange available only for certain imports by selection and restriction.

Other barriers to trade are a noticeable trend toward self-sufficiency on the part of nations, bilateral trading, state trading, inconvertibility of currencies, and the fact that some United States dairy export prices are higher than those of competing countries.

What is being done to eliminate export roadblocks? Continuous studies and reviews are made of all import duties and restrictions on dairy products with a view of recommending changes where warranted.

To alleviate the condition brought about by dollar shortages and the inconvertibility of currency, Congress enacted the Agricultural Trade Development and Assistance Act of 1954 (Public Law 480). That Act provides a means whereby surplus agricultural commodities in excess of the usual marketings of such commodities may be sold through private trade channels, and foreign currencies accepted in payment. These currencies are then expended abroad to the mutual advantage of the United States and the purchasing country. Purposes for which they are spent include expansion of international trade, encouragement of economic development, purchase of strategic materials and payment of United States obligations abroad.

Currently, agreements have been concluded with 18 foreign governments covering agricultural commodities having an export market value of $361 million. Of this amount $6.6 million has been authorized for the purchase of dairy products, and $1,432,000 worth of these products have been delivered.

We hear a great deal about this nation's efforts to sell its surplus commodities abroad, and about concern in other countries that we are going to unload or dump our agricultural commodities at any price we can get

without any regard for the interest of our foreign friends and neighbors. This is simply not true. Some of our dairy export prices are higher than those of competing countries.

As previously stated, we are competitive only with CCC-owned stocks sold for export in carlots. We are not entering into any cut-throat trading operation. We know if we did it would wreck markets, injure other countries, and ruin our chances for long-range market development. At the same time, we are not going to sit back and wait until all other countries have sold everything they have to sell before we try to sell our products.

In duscussing prices for dairy products in export trade, we should keep in mind that other major dairy producing countries, in one way or another, have also prevented dairy products from following normal market channels and seeking prices based on supply and demand. There are consumer subsidy programs to maintain or encourage consumption of dairy products and subsidy programs and support programs to maintain production. In some instances the price to the consumer is subsidized to encourage production. Some countries also subsidize the export of dairy products to the extent that the export price of butter and cheese is less than the domestic wholesale price.

Details of subsidies are another interesting story but time does not permit its development.

Some of the ways the Foreign Agricultural Service hopes to be of assistance to the dairy industry in developing export markets have been mentioned. Another medium which we hope to use is the International Trade Fair. The Department of Commerce has been active in promoting industrial exhibits at these Fairs. Foreign Agricultural Service is cooperating with Commerce, and now agricultural products are becoming a part of the exhibits. Our first experience in dairy product display at such fairs has been at the Pakistan Trade Fair at Karachi where American-made ghee is on exhibit. We hope to stimulate interest in these Trade Fairs as they are held in important market cities throughout the world, and are encouraging participation in them by United States producers and exporters.

The members of our organization have as their primary interest, quality control and quality improvement of milk. Through our efforts, this country has the best fluid milk supply in the world. We must do more on quality improvement of the milk going into manufactured dairy products. We must establish some means to assure that only products of uniform quality are placed on the export market. We desire your cooperation in reaching these goals so that the United States can establish its rightful place in the world dairy products' market.

A PROCEDURE FOR EVALUATING THE EFFICIENCY OF BACTERICIDAL AGENTS

CECIL W. CHAMBERS

Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio

(Received for Publication February 9, 1956)

An up to date revision of a germicide test which has been used at the U. S. Public Health Service, Robert A. Taft Sanitary Engineering Center since 1942. This method combines flexibility with control including methods for determining neutralizer efficiency and toxicity. Test organisms are grown on agar, suspended in buffered water, and filtered through sterile Whatman No. 2 paper. Sufficient test solution is available for related chemical tests. 10 refs.

The test described here has evolved from a method originally reported by Butterfield *et al.* (2) and has been extensively used in germicide research at the Robert A. Taft Sanitary Engineering Center. In continued use it has been necessary to revise and elaborate the procedure as originally employed. This has been particularly true with regard to the sections pertaining to neutralizers and the preparation of cultures and test suspensions. This method combines flexibility with a considerable degree of bacteriological control, and provides a test volume sufficiently large to permit withdrawal of a reasonable number of aliquots for chemical examination. The procedure is a revision of the information recently presented as Germicide Memorandum 1. (1)

A. *Preparation of Glassware*

1. Erlenmeyer Flasks (250-ml wide-mouth)
   (a) Strong, fresh dichromate cleaning solution prepared with concentrated H_2SO_4. Use finely powdered dichromate (to secure maximum dichromate concentration). The saturated aqueous solutions generally specified in cleaning solution formulae are unsatisfactory for this purpose.
   (b) *Fill* and drain completely at least 3 times with both tap and distilled water.
   (c) *Fill* with distilled water and autoclave (15 lbs., 15 min.).
   (d) Drain completely, cap with paper, and sterilize in hot air oven. For most tests, sterilization can be in the autoclave if desired. In tests with low concentrations of chlorine, autoclaving imparts a chlorine demand. Procedures for preparing equipment for use in studies dealing with low concentrations of chlorine have been published (2).
2. Preparation Equipment — containers for collecting test water, including those in which the test concentration of the germicide is prepared as well as graduates or pipettes used in these measurements or in measuring the germicide-water mixture into the test flasks — Same treatment as A - 1 (a).
3. Other Glassware — any good routine laboratory cleaning procedure.
4. General — In the preparation of all glassware other less laborious methods may be used where controls have proven the absence of residual toxicity and/or interference with the activity of the germicide being investigated.

B. *Preparation of Culture Suspension*

1. Use *Escherichia coli* ATCC-11229 or *Micrococcus pyogenes* var. *aureus* F. D. A.-209. Other species may be used for special purposes.

Mr. C. W. Chambers was graduated from Ohio State University in 1932. Since then he has served as an instructor in bacteriology at Youngstown College; as Chemist for the Youngstown Sheet and Tube Company; as Sanitary Bacteriologist, U.S. Public Health Service; Serologist, Ohio Department of Health; and as Research Bacteriologist, U. S. Public Health Service. During World War II he was in charge of a U.S. Public Health Service Trailer Laboratory. Since 1950 Mr. Chambers has been in charge of Germicidal Agents Studies, Water Supply and Water Pollution Control, Robert A. Taft Sanitary Engineering Center.

(a) Nutrient agar[1] shall be used as the growth medium.

(b) Transfer the cultures monthly to an agar slant and incubate 6 to 8 hours at 35°C.

(c) Store at 5° – 10°C for *not more than 1 month* and then transfer the test cultures directly to a fresh agar slant and incubate 6 to 8 hours at 35°C as in Item B-1 (b).

2. Preparation of Stored Culture for Routine Use.

(a) Remove a stock culture from 5 – 10°C storage.

(b) Make daily transfers for 3 successive days to nutrient agar slants incubating the transfers 20 to 24 hours at 35°C.

(c) The third daily transfer (Item B-2 (b) may be used as a source of inoculum for culture to be used in the germicidal tests (Item B-5).

(d) The culture may then be used continuously, so long as daily agar slant transfers are made, subject to the following:

(1) Do not continue to use a culture for more than 30 days without starting anew from a stored stock culture (Item B-1 (c).

(2) If only 1 daily transfer has been missed, no special procedures are required. Two daily transfers may be missed if a transfer is incubated 6 – 8 hours at 35°C and then stored at 5 – 10°C, not to exceed 48 hours, otherwise repeat the four daily transfers as noted in Item B-2 (b).

3. As an added safeguard, it is recommended that the resistance of the test cultures to phenol be determined at least every three months by the AOAC method. (5) It may also be desirable to conduct culture resistance tests using the active agent of a particular germicide.

4. Inoculate into a 175-ml. Pyrex French square bottle (borosilicate glass) containing 20 ml. of nutrient agar which has been fortified by the addition of 1½ percent (15 g. per liter) of extra agar and allowed to solidify with the bottle resting in a horizontal position.

5. Culture bottles are inoculated by washing the growth from an agar slant into a 99-ml. phosphate buffer dilution blank, (8) and adding 2 ml. of this suspension to each culture bottle which is tilted back and forth to distribute the suspension after which excess liquid is drained off. Incubation is for 18 to 24 hours at 35°C, agar side down.

6. Culture is removed from the agar surface of 5 culture bottles of the type described in Item B-5 above, using 4 ml. of phosphate buffered dilution water (8) to suspend the growth from each bottle. This is accomplished by gently shaking the suspending fluid back and forth over the agar surface. Suspension so prepared is transferred to a screw cap tube and violently agitated, following which it is filtered through a sterile No. 2 Whatman paper, the filtrate being collected in a sterile screw cap tube. Removing culture by rubbing the agar surface with an inoculating needle or stirring rod is to be avoided due to increasing the amount of agar suspended. The number of bottles of culture used may be varied according to the volume of suspension needed. With *E. coli* ATCC 11229, suspension prepared in the manner described should contain approximately 10,000,000,000 organisms per ml. When 1 ml. of this suspension is added to 99 ml. of test water the density of organisms in the germicide test mixture should be approximately 100,000,000 per ml. (4) Any lower suspension density desired may be obtained by dilution.

During the filtration the surface of the filter should be periodically cleaned by gently rubbing with a sterile policeman or stirring rod. Contact with the tip of the filter should be avoided and reasonable caution must be exercised at all times to avoid rupturing the filter. However, these filters are sufficiently strong to withstand a considerable amount of such rubbing. This treatment should be initiated whenever the liquid in the funnel stem is obviously beginning to clear.

7. During an experiment the tube containing the filtered suspension is stored in a beaker containing cracked ice.

C. *Neutralizer*

An effective non-toxic neutralizer for instantly stopping the bactericidal action shall be used and neutralizing effectiveness and toxicity shall be determined as follows:

1. Toxicity:

Using suspension prepared in Item B-6, make a dilution using phosphate buffered water (8) which contains from 750 to 1250 organisms per ml.

[1]Containing per liter: 15 g. agar, 3 g. beef extract, 5 g. peptone (Bacto or equivalent – *special grades not to be used*). Other, non-specified, media may be used if it has been determined that nutrient agar is not a satisfactory medium when test organisms other than *E. coli* or *M. pyogenes* var. *aureus* are used.

Add 1 ml. of this dilution to 9 ml. of neutralizer in a screw cap test tube. Mix quickly and *immediately* plant and *immediately* pour with agar a set of 3 plates, each containing a 1-ml. portion from this neutralizer tube. Plant a second such set of plates from this tube at a time equal to the maximum interval between neutralization and plating in a germicide test. The temperature of the material in the neutralizer tubes should not be less than 25°C during these tests. Any significant reduction in count between the first and second planting indicates that the neutralizer is toxic to the test organisms. This test should be repeated a sufficient number of times to leave no doubt as to the absence of toxicity and should also be repeated whenever a new lot of test tube caps or cap liners is put into service.

2. Neutralizer Effectiveness:
Prepare a dilution of the bactericide (at least as strong as the test concentration) in *distilled* water. Add 1 ml. of the bactericide to a tube containing 9 ml. of neutralizer, followed in not more than 15 seconds by 1 ml. of the dilution of test organisms previously described in Item C-1. Mix quickly and plant as in Item C-1. Any significant reduction in count between the first and second planting indicates inadequate neutralization of the bactericide.

3. Neutralizer blanks are prepared by dispensing neutralizer solution in 16 x 125 mm. screw cap test tubes, 9 ml. per tube. The method of sterilization is not stipulated due to the fact that the stability of the particular neutralizer used may have a marked bearing on the method of sterilization necessary.

4. Tween 80 Asolectin (lecithin) (6,10) is a satisfactory neutralizer for testing quarternary ammonium compounds. However, the required concentration of neutralizer varies with different test organisms and neutralizing effectiveness sould be determined when test organisms other than *E. coli* and *M. pyogenes* var. *aureus* are used. Sodium thiosulfate is a satisfactory neutralizer for hypochlorite type compounds and should be used at a concentration which provides an excess of neutralizing capacity. Tween 80 Asolectin and sodium thiosulfate neutralizers may be sterilized at 121°C for 15 minutes.

D. *Agar for Plating*

Tryptone glucose extract agar or other agar medium of proven productivity for the test organism used.

E. *Test Water*

Selection of a test water is governed by the particular application for which the germicide is being investigated. Accordingly, the water may be either natural, tap, or synthetic, including organic additives, if desired. When tap waters are used, the following precautions should be taken:

Test tap waters for chlorine and, if present, dechlorinate by the following procedure: Add, in small increments, 0.2 percent sodium sulfite (freshly prepared in water which is boiled, cooled and immediately used to prepare the solution) determining the chlorine concentration, using the orthotolodine test after each addition of sodium sulfite. When a point is reached where only a trace (less than 0.01 ppm) of chlorine remains, add enough sodium sulfite to leave a slight excess after all of the chlorine is destroyed. Determine by test that no chlorine remains. If the water is then shaken vigorously and allowed to stand for a few hours, the excess sodium sulfite will be oxidized. Dechlorination may also be accomplished by means of sunlight or ultraviolet lamp.

An alternate dechlorination method can frequently be used. In this method a measured amount of sodium sulfite solution, more than adequate to neutralize the chlorine in the volume of water to which it is added, is introduced into a measured volume of water. Elimination of chlorine is verified by test. The applicability of this method is determined by establishing, by means of a sufficient number of control tests, that the amount of sodium sulfite added does not in any way affect the action of the germicide being tested.

In critical work involving the germicidal effect of low concentrations of halogens, a chlorine-free chlorine-demand-free water should be used. (3)

Where tap water is treated by processes other than chlorination, residual germicide must be eliminated by an appropriate method.

References to some synthetic test waters are included. (7,9)

F. *Performance of Test*

1. Measure 99 ml. of test water, containing bactericide at the concentration to be tested, into chemically clean, sterile, 250-ml. *wide mouth* Erlenmeyer flasks and place in constant temperature bath until temperature becomes stabilized at 25°C., or whatever temperature is appropriate for the application considered. Prepare duplicate or triplicate flasks for each germicide to be tested. Also, prepare a similar flask, using distilled water, for each germicide tested and an "initial numbers" control con-

taining 99 ml. of test water to which no germicide has been added. If more material is needed for related chemical tests, the volume may be increased by using larger flasks and maintaining a ratio of 1 ml. of test suspension for each 99 ml. of test water.

2. Add 1 ml. of culture suspension to each test flask as follows: whirl flask, stopping just before suspension is added, creating sufficient residual motion of liquid to prevent pooling of suspension at point of contact with test water. Add suspension midway between the center and edge of the liquid surface with tip of pipette slightly immersed in test solution. *Avoid touching pipette to neck or side of test flask during addition of suspension.* Transfer 1 ml. portions to neutralizer blanks at exactly 15 and 30 seconds, 1, 2, 5, 10, 20 and 30 minutes or whatever time interval may be appropriate for the application anticipated, and mix well immediately after transfer. In the case of the "numbers control", plants need only be made immediately after adding culture and again after an interval equal to the longest time used in an actual test with germicide, *e.g.*, if the maximum exposure in a germicide test flask is 20 minutes then the "numbers control" would be planted initially and again after 20 minutes. In the "numbers control" there should be no significant change in count between the initial and final planting.

   In the performance of the test when short time intervals are used, it has been found advantageous to use milk pipettes for adding the culture and withdrawing samples (due to their fast drainage rate.)

3. Plate from neutralizer tube to agar. Where 1/10 ml. portions are planted a 1 ml. pipette graduated at 1/10 ml. intervals is suggested.

   For necessary dilutions to give countable plates use phosphate buffer dilution water prepared according to Standard Methods. (8)

4. Incubate plates at 35°C for 48 hours before counting. In initial tests with a given germicide, if plates counted at 24 hours show no increase in count after reincubation for an additional 24 hours incubation time may be shortened to 24 hours in subsequent work with that germicide.

5. Sterility Controls: (To be included in each experiment) All sterility controls are poured agar plate determinations.

   (a) Neutralizer — plant 1 ml. from a previously unopened tube of neutralizer.

   (b) Each type of test water used — 1 ml. quantity in a plate. Certain raw or other unsterilized natural or tap waters may not be entirely sterile. Therefore, sterility must be determined insofar as presence of the test organism is concerned. In practice, the problem of small numbers of extraneous contaminants generally resolves itself because these organisms are usually killed by contact with the germicide prior to adding the test organisms.

   (c) Sterile distilled water used for germicide testing — 1 ml. in 1 plate.

   (d) Control on each bottle of agar.

   (e) Culture survival control — Immediately after last test flask as been dosed, add 1 ml. of "culture suspension" (Item F-2) to 99 ml. of dilution water and plant dilutions to determine whether original bacterial concentration of suspension has remained constant throughout the elapsed time of the entire experiment.

6. After counting plates confirm that surviving organisms were *E. coli* by transfer to brilliant green bile broth fermentation tubes. (8) Usually, it is only necessary to pick from representative colonies, if many survivors are present. However, where only a few colonies survive, there is more justification for confirming all colonies. The same procedure should be used with other test organisms using a satisfactory confirmatory procedure or medium. Confirmation by staining is suggested when *M. pyogenes* var. *aureus* is the test organism. *In all instances sufficient colonies should be confirmed to leave no question that survivors were actually the test organism rather than a contaminant.*

7. Determine pH initially on each type of test water used and on each individual test flask immediately after the last portion is removed for a bacteriological determination.

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3-A SANITARY STANDARDS FOR DAIRY EQUIPMENT

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Many have asked the question, "What are 3-A Sanitary Standards for dairy equipment?" We might say that a 3-A Sanitary Standard sets forth the criteria for (a) the material used in the construction of a piece of dairy equipment, (b) the fabrication and design of such material, and (c) its construction including the finish of the material, etc., which are considered to be essential from a sanitary standpoint in the use and maintenance of such equipment and its sanitary performance.

Such a standard is developed through the joint collaboration of (1) manufacturers of such equipment with (2) users of such equipment, and (3) the International Association of Milk and Food Sanitarians' Committee on Sanitary Procedure and (4) representatives of the Milk and Food Program of the U. S. Public Health Service.

A second question which might well come to mind is, "To what items of dairy equipment do 3-A Sanitary Standards apply today?" The following is a list of the 18 standards that have been approved and have been published as of this date:

- Fittings used on Milk Products Equipment
- Thermometer Fittings and Connections
- Storage Tanks
- Milk Pumps
- Weigh Cans and Receiving Tanks
- Homogenizers
- Automotive Transportation Tanks
- Electric Motors and Motor Attachments
- Can-Type Milk Strainers
- Filters Using Disposable Filter Media
- Determining Holding Time of High-Temperature Short-Time Pasteurizers
- Plate Type Heat Exchangers
- Internal Tubular Heat Exchangers
- Installation and Cleaning of Cleaned-In-Place Pipelines
- Holding and/or Cooling Tanks
- Automotive Milk Transportation Tanks for Bulk Delivery and/or Farm Pick-up Service
- Inlet and Outlet Leak Protector Plug Valves for Batch Pasteurizers
- Manually Operated Bulk Milk and Milk Products Dispensers, Multi-Service Milk Containers, and Dispensing Mechanisms

When was the program organized and what is the membership, say, of the 3-A Sanitary Standards Committees? The International Association of Dairy and Milk Inspectors in the late 1920's established a committee on Dairy and Milk Plant Equipment. According to C. A. Abele, Chairman today of the Committee on Sanitary Procedure of the International Association of Milk and Food Sanitarians, the earlier committee's 1933 report asserted that much dairy equipment failed at that time to meet health and sanitary standards. The report continued "that much could be gained if some organized group of control officials, preferably a committee of this organization, could confer with manufacturers, and gradually develop standards which would generally be accepted." This statement of some 23 years ago urged an extension of effort, however, that was already under way. The then International Association of Milk Dealers (now the Milk Industry Foundation) and the then Dairy and Ice Cream Machinery and Supplies Association (now the Dairy Industries Supply Association) had already, in the 1920's, worked with numbers of city, state and Federal enforcement people in developing understandings that became forerunners of our present 3-A Sanitary Standards for Dairy Equipment.

It was suggested at some time in the 1930's that the standards that were being developed at that period by the three organizations named in the brief history given above should be known as 3-A Sanitary Standards because of their three-party nature. This title has been retained over the years although it now indicates three different groups, namely: (1) the International Association of Milk and Food Sanitarians, (2) the U.S. Public Health Service, and (3) The Dairy Industry Committee. The first two groups are well known to all sanitarians. The Dairy Industry Committee is an association of eight trade associations, representing the dairy processors of the country. It has a Sanitary Standards Sub-Committee which works with respective committees of the two other groups in today's formulation of standards. The eight associations which make up the Dairy Industry Committee are:

- American Butter Institute
- American Dry Milk Institute
- Dairy Industries Supply Association (DISA)
- Evaporated Milk Association
- International Association of Ice Cream Manufacturers
- Milk Industry Foundation

Presented at the annual meeting of the FLORIDA ASSOCIATION OF MILK & FOOD SANITARIANS, Gainesville, Florida, March 22, 1956.

National Cheese Institute
National Creameries Association

DISA, representing equipment and supplies manufacturers, is listed among these industry associations; all of the rest are dairy processor associations in the Dairy Industry Committee. DISA, however, in certain practical procedures in the formulation of a sanitary standard, itself becomes one sole side of a three-sided arrangement, the other two sides being, respectively, the user spokesmen as a seven-part group within the Dairy Industry Committee and the sanitarian-public health spokesmen as a two-part group. So, although names of organizations change, and additional organizations, in new alignments, take part, the standards work is still the product, as it was in the beginning, of the collaboration of equipment maker, equipment user and enforcement officers.

The first rough equivalent of a 3-A Sanitary Standard—although it was not referred to then by that name—was developed in 1929 and applied to sanitary fittings used in milk plants. It appeared in the form of dimensional drawings and there was no reference to the type or composition or finish of the metal of the fittings. The standards work slowly broadened throughout the 1930's. Then, after the end of World War II, the sanitarians and the users and the manufacturers of equipment began to formulate and publish the standards in the particular manner which now is followed. The eighteen standards that are now available have been mentioned above.

The next question that might come to mind is, "How and by whom, then, is a 3-A Sanitary Standard developed today?" The procedure by which a 3-A Sanitary Standard is developed is briefly as follows: (1) A request that a standard be developed for a certain type of equipment is presented by a sanitarian, or a U.S. Public Health Service representative, or representatives of the users, or by an equipment company or equipment man to the Executive Committee of the 3-A Sanitary Standards Committees. This Executive Committee considers the request, in terms of the need for such a standard or the timeliness of action to meet the need. If it approves the request, it asks DISA to name a task committee, membership on which is open to a representative of each DISA company of record manufacturing the type of equipment in question. All other manufacturers of record, also, are urged by DISA to participate in the discussions of that task committee, and their views are accorded full weight. The task committee meets, names a Chairman and proceeds to develop a tentative standard for the equipment.

Usually after several meetings and usually, too, after unanimous agreement as to the content, the tentative standard is submitted by the DISA Task Committee to the Sanitary Standards Sub-Committee of the DIC, that is, to the representatives of the users. Following a study by this DIC Sub-Committee, the DISA Task Committee reviews the users' comments. The Task Committee, having had the benefit of an expression of the users' views, revises the tentative standard which again then is submitted to the Sanitary Standards Sub-Committee of the DIC.

When a tentative standard, perhaps revised by the DISA Task Committee several times, is fully approved by the DIC Sanitary Standards Sub-Committee, it goes forward to the Committee on Sanitary Procedure of the International Association of Milk and Food Sanitarians and the Milk and Food Program staff of the U.S. Public Health Service, for study from that vital side of the co-operative triangle. After a minimum of six weeks has been allowed for such study, the tentative standard is then considered at a semi-annual joint meeting of the DIC Sanitary Standards Sub-Committee, of the Committee on Sanitary Procedure of the International Association of Milk and Food Sanitarians and of the representatives of the Milk and Food Program of the U.S. Public Health Service. DISA, too, is represented at this joint session.

Usually, afterward, the DISA Task Committee again revises the tentative standards, because of new suggestions and attitudes brought to light by the all-parties discussion.

Perhaps the various stages in the development of a standard are repeated, in the same sequence, several times more, before a tentative standard wins the approval of all the parties. When it has won approval it is signed by the Chairman of the Committee on Sanitary Procedure of the International Association of Milk and Food Sanitarians, by the Chief of the Milk and Food Program of the U.S. Public Health Service, by the Chairman of the Sanitary Standards Sub-Committee of the Dairy Industry Committee and by the Chairman of the DISA Technical Committee. Then it is published in the next issue of the Journal of Milk and Food Technology as a completed 3-A Sanitary Standard.

Those makers of equipment who desire from the first to abide by the standard are, as a practical manufacturing matter, allowed one year from the date of the signing of the standard to bring their equipment into conformity with the standard's provisions. But there is no compulsion upon anyone, whether equipment company, user company, or enforcement officer, to accept a 3-A Sanitary Standard.

Reprints of the standard, as soon as it has been published, become available, on request, to all members of dairy trade associations, to all enforcement officers,

and of course, to other persons having a legitimate interest.

Certain points should be re-emphasized. One is that 3-A Sanitary Standards are developed out of the richest and most practical experiences of the enforcement people, the dairy processors and the equipment manufacturers—out of the knowledge and practicality and integrity and mutual respect of all the three important interests. No one "puts across" a sanitary standard. When a standard is signed, it has already traveled the straight and narrow, the super critical road of all parties' examination.

The other point is that this very process of three-sided standards formulation becomes a democratic process. An equipment manufacturer doesn't have to belong to any trade association to suggest the need for a standard or to sit with a Task Committee in developing successive tentative drafts. *Any* dairy processor can make himself heard as a standard is developed. *Any* enforcement officer can find one or more ready channels through which to be heard.

And—again—no one is compelled to adopt or abide by a standard. Plain and simple and wholesome self-interest, and professional devotion to the public welfare are the real advocates of a sanitarian's or a processor's or an equipment manufacturer's acceptance of a 3-A Sanitary Standard.

Someone might well raise the question, "But why *have* 3-A Sanitary Standards for Dairy Equipment?" or "*Is* there a need for them?"

Many do not realize that there is a standard for virtually everything we purchase—although one may not be conscious of it when he or she makes a purchase. There are standard grades of milk and dairy products, for example. There are standard grades of paper, packages, foods, feeds, fertilizers, pharmaceuticals and cosmetics, building materials, the material from which dairy equipment is fabricated, including 18-8 stainless steel, and of hundreds of other products. *Sanitary standards* for dairy equipment protect everyone who consumes milk in any form.

We have in the U.S. many hundreds of local milk ordinances. In each one there are prescribed certain enforceable criteria regarding the sanitation of equipment in the milk plants. It has been the practice of many sanitarians to apply highly individualistic sanitation standards to the equipment in the plants they supervise. At one time, because of this there were many differences among locally enforced standards, many of which really approached the nature of actual specifications for equipment construction. Under such circumstances many misunderstandings and disagreements among sanitarians, manufacturers, and users developed, with the user usually in the middle. Much of this misunderstanding and disagreement was due to a lack of common language which could be used by the three groups to indicate exactly what was wanted or needed for adequate public health protection or for workmanlike and practical equipment building. So this resulted in many pieces of equipment having to be custom made, not for basic technologic or economic causes but because of not always justifiable requirements peculiar to one or a few health jurisdictions. Many times it was necessary for the manufacturer to send mechanics into the field to make structural changes in equipment after it had been delivered to a user, although identical equipment was everywhere else approved without change. All of these things resulted in substantial increases in costs—costs to the user; costs to the manufacturer; overall enforcement costs due to constant "confusion in the craft"; costs, all of which accumulating, raised the cost to the consumer of milk and dairy products.

Sanitarians have been heard to say that some of their number are inclined to become, over the years, somewhat eccentric and possibly at times arbitrary as a result of some one particular problem they have had which caused them considerable trouble. Sometimes sanitarians take almost opposite positions on certain rather simple matters—which naturally would lead one to ask, "What *is* the correct health and sanitary view?" This would seem to indicate a general need for the development of rather universally acceptable sanitary standards for dairy equipment.

We in the industry do not consider the terms of the printed standards a full measurement of the accomplishments of the 3-A Sanitary Standards movement. We ask, "What are the effects of the standards, now that they exist and that their number is increasing?" This is how Dr. E. H. Parfitt, Chairman of our 3-A Sanitary Standards Committees and an equipment users' spokesman answered that question before the annual meeting of the Association of Food Industry Sanitarians in San Jose, California, in November of 1952:

> "For the industry: increased usable life of dairy equipment. Interchangeability of equipment within the industry. Creation of a nationally accepted standard. Reduction in operating costs. Standard for self inspection."
>
> "For the Fabricator: Knowledge of acceptable design. Knowledge of acceptable materials. Application of acceptable sanitary design principles to other equipment for which 3-A Standards have not been developed. Reduction in dies, tools, pattens, etc. Stimulation of inventive design and construction."
>
> "For the Sanitarian: Minimizes confusion as to what constitutes sanitary design and construction. Establishes a base from which to work in considering what constitutes sanitary design and construction for other

food handling equipment in general. Increased prestige as a result of call abarative work with industry."

Another question might be, "Are 3-A Sanitary Standards, which have been approved by all parties, kept up-to-date?" It is the practice of the DISA Task Committees to review each standard at least once every two years. Each standard that may be developed can, of course, be amended and several have been amended; namely, those for fittings, thermometers, milk pumps and automotive transportation tanks; and several other standards are now in the process of being amended. For example, it is expected that amendments to the storage tank standard which have been drafted over the last several months and which were approved at the last meeting of the joint committees held in Evanston, Illinois, last Fall, will be signed and approved very shortly. Also amendments to the standards on farm milk tanks are to be considered at the next semi-annual joint meeting of the Committees which will be held in the Washington area April 23rd to 26th.

All amendments are developed by exactly the same procedures as are the original standards—by the careful, slow and democratic procedures previously discussed.

"How may a 3-A Sanitary Standard for an item of dairy equipment assist the state or local sanitarian in his daily work?" A 3-A Sanitary Standard for a piece of dairy equipment gives a sound and firm base on which a sanitarian can act in approving equipment in a processing plant that comes under his jurisdiction. If a 3-A Sanitary Standard has been developed for a type of equipment and a particular piece of equipment of that type which is being inspected meets that Standard, then one is assured that the experience and knowledge of the many members of the Committee on Sanitary Procedure of the International Association of Milk and Food Sanitarians are supporting the approval of the equipment. The sanitarian will know that he is in line with an industry-wide voluntary movement that rests upon a blending of industrial science and public health science and is capable of bringing orderliness and a justifiable degree of economy into operations that affect the health and well-being of every citizen and every enterprise that he serves. The sanitarian will know that he is an active participant in one of the soundest and most beneficial activities under way in the food-safety world today.

AN ECONOMICAL SEMI-MECHANICAL STIRRER AND TAPPER FOR THE CRYOSCOPE

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Construction of an economical semi-automatic sample stirrer and thermometer tapper for the cryoscope is described in detail. These accessories save time and permit closer duplication of results on freezing point of milk.

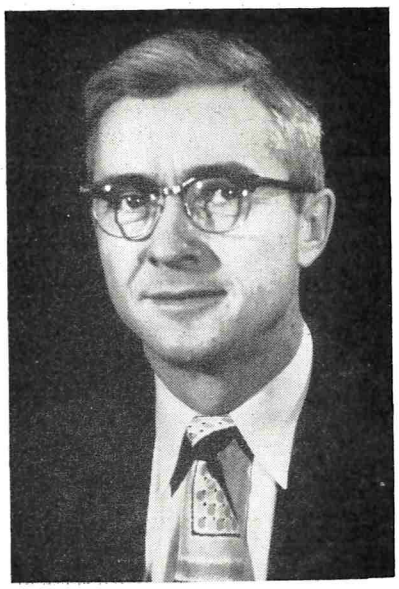
In 1953 Shipe (2) described equipment for automatically stirring the sample and tapping the thermometer in cryoscope determinations. He felt that mechanical methods would insure more uniformity and be more convenient than manual manipulations. Individual variations in interpretation of directions and in performance of determinations were minimized. More uniformity of temperature control and a time saving per determination were also accomplished.

Robertson (1) suggested two modifications of Shipe's mechanical stirrer and tapper. Previously recommended equipment involves considerable expense, therefore, an effort was made to simplify the device and reduce the cost without materially affecting accuracy.

Several years ago a mechanical stirring device was developed at the Indiana State Board of Health Dairy Products Section laboratory in Indianapolis, Indiana utilizing an automobile vacuum-type windshield wiper motor for power and stroke. The rotating wiper arm, considerably shortened, was connected with a piece of fish line through a single wheel pulley to the top of the stirrer. Recently this relatively simple device was modified to include an automatic thermometer tapper.

Figure 1 shows a front view of the apparatus. Figure 2 shows a side view. A vacuum-type windshield wiper motor was securely fastened to the center of the wooden back of an Eimer & Amend cryoscope with L-shaped pieces of metal. A 3/8 in. diameter hole was bored in the wooden back, for admitting the motor rocker arm shaft through to the front side. The center of this hole was located 12 3/8 in. above the top shelf holding the Dewar flask. A 3/32 in. diameter hole was bored near the end of the rocker arm at right angles to the shaft. In the end of the shaft, parallel to the axis, a hole was drilled and threaded to admit an Allen head screw 1/4 in. long and 3/32 in. in diameter. A piece of welding rod 3/32 in. in diameter and approximately 5 1/2 in. long was inserted through the shaft and secured with the Allen head screw. The welding rod was bent at a 110° angle from the horizontal, 3 3/8 in. from one end. A loop (A) was made in the short end for attaching the nylon fish line. Two Marr electrical connectors were placed on the straight end of the welding rod to provide adjustment of the stroke.

A 3/16 in. diameter hole was bored in the wooden backboard for the support rod about 3/4 in. to the left and 2 1/4 in. above the rocker arm shaft. The pully and arm extend forward 3 1/2 in. from the front of the wooden backboard and have a wheel 1/2 in. in diameter at the end. A piece of fish line is tied to the loop on the 3/32 in. welding rod arm, passes over the



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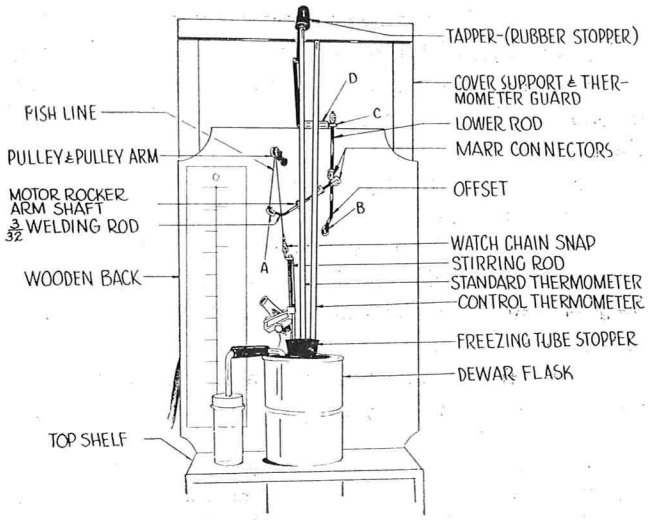

Figure 1. Front view, illustrating stirrer connected to cryoscope.

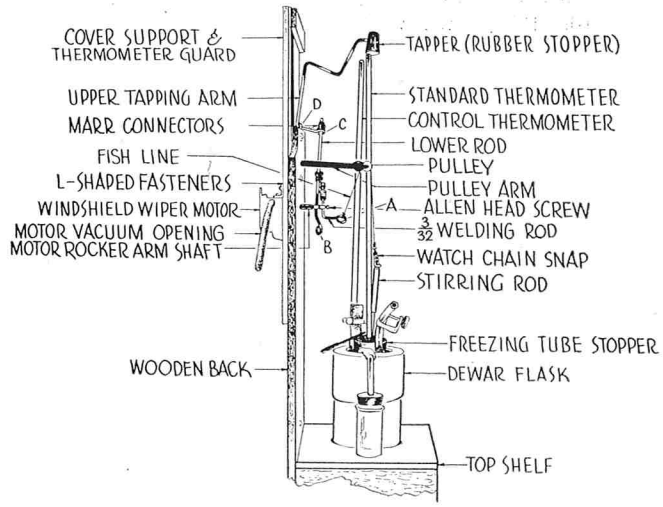

Figure 2. Side view, illustrating stirrer connected to cryoscope.

pully, and down to the top of the stirring rod. A snap from a watch chain is tied to the lower end of the fish line. An L-shaped metal piece, with a hole bored near each end, was secured on the top of the stirring rod with a small nut. The snap is fastened into the other hole. The fish line is adjusted to allow a 1 to 1 1/2 in. stroke.

The tapper consists of two lengths of 1/8 in. welding rod. The lower rod is approximately 6 1/2 in. long. The lower end of the rod has a loop (B) and an offset. Two more Marr electrical connectors are used on its upper end for adjusting the length of the tapping stroke. A piece of welding rod 1/8 in. in diameter and approximately 11 in. long was used for the tapping arm. A No. 0 rubber stopper was placed at one end and a loop (C) at the other end. The rod is held securely to the wooden back by a piece of metal fashioned in the shape of a hinge (D).

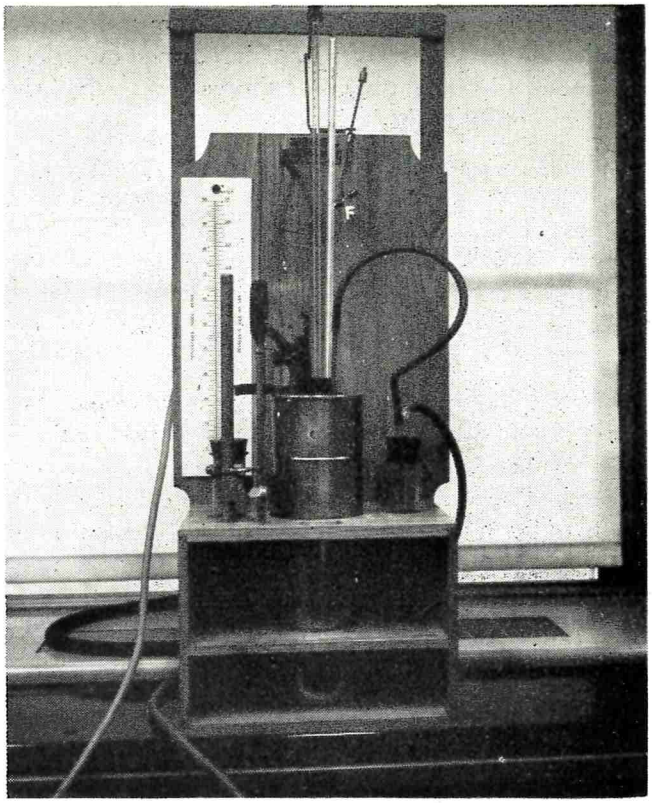

Figure 3. Front view, illustrating tapper connected to cryoscope. Shown by (F).

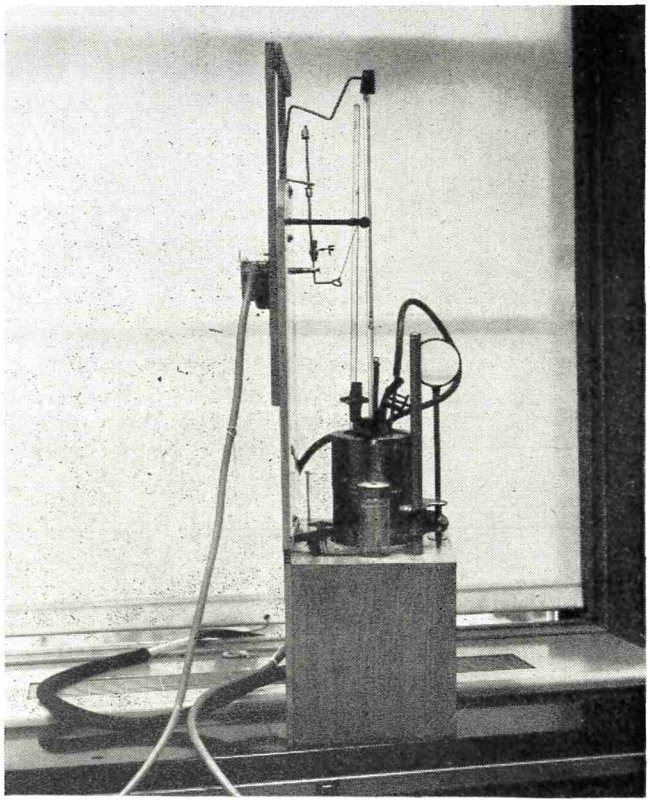

Figure 4. Side view, illustrating tapper connected to cryoscope. Shown by (F).

The stirrer is operated separately from the tapper. The stirrer is connected and vacuum turned on. Speed of stroke can be controlled at the vacuum valve, the wiper motor, or both.

Stirring proceeds until the sample is supercooled, at which point it is seeded to start the freezing action. The mercury immediately starts to rise rapidly and stirring is continued until the rising column slows perceptibly as it approaches its highest limit (i.e. when the thermometer reads about 0.07°C. below the expected freezing point).

The mechanical stirrer is then disconnected, the stirrer *slowly* and *carefully* manipulated two or three times by hand, after which the tapper is connected. Vacuum is again turned on. Tapping is continued until the mercury column remains stable (3) for at least one minute. A reading of the freezing point is then made, being careful to avoid parallax.

Maximum stroke of the tapper is one inch.

RESULTS AND CONCLUSION

The average of the differences observed in freezing point determinations on 18 raw milk samples was 0.0026°C. The minimum difference was 0.000°C. and the maximum was 0.007°C.

This stirrer and tapper is economical to construct, saves time, and permits closer duplication of results.

ACKNOWLEDGEMENTS

The author wishes to thank Wilbur Barton, Maintenance Engineer, Indiana State Board of Health and C. E. Schrock, Bacteriologist, Indiana State Board of Health for their suggestions and assistance in devising this accessory to the cryoscope.

REFERENCES

1. Robertson, H. A. Personal correspondence 1955.
2. Shipe, W. F., Dahlberg, A. C., and Harrington, B. L. A Semi-Automatic Cryoscope for Determining the Freezing point of Milk. J. Dairy Sci., **36**: 916-923. 1953.
3. Standard Methods for the Examination of Dairy Products. American Public Health Association, New York, N.Y. 10th Ed. pp. 272-4, 1953.

PROGRAM

FORTY-THIRD ANNUAL MEETING

INTERNATIONAL ASSOCIATION OF MILK AND FOOD SANITARIANS, INC.

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SPECIAL ACITIVITIES PROGRAM

Washington State Association

MONDAY, SEPTEMBER 3, 1956

9:00 *A.M* — 1:00 *P.M.*—Meeting of Executive Board
2:00 *P.M* — 6:00 *P.M.*—Meeting of Executive Board
8:00 *P.M.*—Meeting of Executive Board with Local Arrangements Committee

TUESDAY, SEPTEMBER 4, 1956

9:00 *A.M.*—12 *Noon*—Meeting of Executive Board
1:30 *P.M.*— 5:00 *P.M.*—Individual Committee Meetings
1:00 *P.M.*— 2:15 *P.M.*—Meeting of Journal Editors with Executive Board
2:30 *P.M* — 5:00 *P.M.*—Meeting of Council with Executive Board
5:00 *P.M.*— 8:00 *P.M.*—Dinner and reception to Executive Board members attended by Washington State Association

WEDNESDAY MORNING — SEPTEMBER 5, 1956

PAUL CORASH, *President-Elect*, Presiding
8:00 *A.M.*—Registration
10:00 *A.M.*—Invocation
10:05 *A.M.*—Address of Welcome:
HON. GORDON S. CLINTON, *Mayor*
Seattle, Washington
Introduced by CAMERON ADAMS, *Chairman, Local Arrangements Committee*
Washington State Department of Agriculture, Olympia, Washington
10:20 *A.M.*—Presidential Address:
PROFESSOR H. S. ADAMS, *President*
Indiana University School of Medicine
Indianapolis, Indiana
Appointment of Nominating Committee —Charge to the Committee
10:45 *A.M.*—"Research Needs in the Field of Milk and Food Sanitation."
DR. KEITH LEWIS
Chief of Milk and Food Research
United States Public Health Service
Robert A. Taft Engineering Center
Cincinnati, Ohio
11:15 *A.M.*—"Laboratory Problems of Importance to Milk and Food Sanitarians."
A Report of the Committee on Applied Laboratory Methods.
DR. FRANKLIN W. BARBER, *Chairman*
National Dairy Research Laboratories
Oakdale, L.I., N.Y.

11:30 *A.M.*—"The Bacteriology of Precooked Frozen Foods."
PROFESSOR H. H. WEISER
Department of Bacteriology
Ohio State University
Columbus, Ohio

12:00 *NOON*—Announcements

LUNCHEON RECESS

WEDNEDAY AFTERNOON — SEPTEMBER 5, 1956

HAROLD S. ADAMS, *President IAMFS*, Presiding

1:45 *P.M.*—Film

2:00 *P.M.*—Door Prize Drawing

2:15 *P.M.*—"Sanitary Aspects of Radiation Resistant Bacteria in Foods."
DR. PAUL R. ELLIKER, *Chairman*
Department of Bacteriology
Oregon State College
Corvallis, Oregon

2:45 *P.M.*—"Report of the Committee on Food Equipment."
WILLIAM V. HICKEY, *Chairman*
Department of Health
Salt Lake City, Utah

3:00 *P.M.*—Sightseeing Boat Trip
Puget Sound area

6:00 *P.M.*—Salmon Bake
Inglewood Golf and Country Club
Lake Washington

THRUSDAY MORNING — SEPTEMBER 6, 1956

MIKE O'CONNER, *President Washington Association*, Presiding

8:45 *A.M.*—Film

9:00 *A.M.*—Door Prize Drawing

9:10 *A.M.*—Report of Nominating Committee

9:15 *A.M.*—"Quality Standards for Pre-formed Milk Cartons."
HAROLD WAINESS
Harold Wainess Associates
Chicago, Illinois

9:45 *A.M.*—"Report of the Committee on Sanitary Procedure."
C. A. ABELE, *Chairman*
Diversey Corporation
Chicago, Illinois

10:00 *A.M.*—"Aspects of Chemical Food Additives."
DR. K. G. WECKEL
Professor of Dairy and Food Industries
University of Wisconsin
Madison 6, Wisconsin

10:30 *A.M.*—"Public Health Aspects of Frozen Foods"
A report of the Committee on Frozen Food Sanitation.
MR. FRANK E. FISHER, *Chairman*
Indiana State Board of Health
Indianapolis, Indiana

10:45 *A.M.*—"3-A Sanitary Standards for HTST Pasteurizers."
MR. C. W. WEBER
Associate Milk Sanitarian (Equipment)
New York State Department of Health
Albany, New York

11:15 *A.M.*—"The Etiology and Epidemiology of Paralytic Shellfish Poisoning."
MR. H. I. EDWARDS, *Analyst*
Department of National Health and Welfare
Food and Drug Directorate
504 Federal Building
Vancouver 2, B.C.

11:45 *A.M.*—"Problems Related to the Bulk Handling of Milk and Other Labor-Saving Devices."
A Report of the Committee on Dairy Farm Methods.
MR. CHESTER BLETCH, *Chairman*
Virginia-Maryland Milk Producers Association
Washington, D.C.

LUNCHEON RECESS

THURSDAY AFTERNOON — SEPTEMBER 6, 1956

HAROLD B. ROBINSON, *First Vice President IAMFS*, Presiding

1:45 *P.M.*—Movie

2:00 *P.M.*—Door Prize Drawing

2:15 *P.M.*—Symposium — "Food-borne Disease Outbreaks."
DR. R. J. HELVIG, *Panel Chairman*
"The Development of a Suggested Procedure for the Investigation of Food-borne Disease Outbreaks."
DR. R. J. HELVIG, *Assistant Chief*
Milk and Food Program
Division of Sanitary Engineering Services
United States Public Health Service
Washington, D.C.

2:35 *P.M.*—"Field Application of the Suggested Procedure for The Investigation of Food-borne Disease Outbreaks."
DR. W. R. GIEDT, *Head*
Epidemiology and Laboratory Section
Washington State Department of Health
Seattle 4, Washington

3:05 *P.M.*—"The Laboratory Aspects of Investigating Food-borne Disease Outbreaks."
MR. K. R. BERQUIST, *Assistant Head of*

Laboratory Department of Health
Division of Preventive Medical Services
Smith Tower
Seattle 4, Washington

3:35 *P.M.*—"Public Health Aspects of Food-borne Outbreaks."
DR. SAMUEL H. HOPPER
Professor of Public Health
Indiana University School of Medicine
Indianapolis 7, Indiana

4:05 *P.M.*—"The Role of the Sanitarian in the Investigation of Food-borne Outbreaks."
MR. HAROLD B. ROBINSON, *Chief*
Milk Sanitation Section
Milk and Food Program
Division of Sanitary Engineering Services
United States Public Health Service
Washington, D.C.

4:35 *P.M.*—Discussion Period

5:00 *P.M.*—"Report of the Committee on Educational and Professional Development."
DR. JOHN J. SHEURING, *Chairman*
University of Georgia
Athens, Georgia

ADJOURNMENT

7:00 *P.M.*—Banquet
Spanish Ballroom-Olympic Hotel
Master of Ceremonies: Mr. JAMES C. GREENWAY, Assistant Manager Carnation Milk Co., Seattle, Washington.
Banquet Speaker: JUDGE JOSEPH A. MALLERY, Washington State Supreme Court.
Presentation of Past President's Certificate to IVAN PARKIN by H. S. ADAMS, *President.*
Presentation of Citation Award and Sanitarians Award* by JOHN D. FAULKNER, Chairman of the Committee on Recognition and Awards.
*The Sanitarians Award is supported jointly by the Diversey Corporation, Klenzade Products, Inc., Oakite Products, Inc., Olin Mathieson Chemical Corporation, and the Pennsylvania Salt Manufacturing Company, and is administered by the International Association of Milk and Food Sanitarians, Inc.

FRIDAY MORNING — SEPTEMBER 7, 1956

CAMERON S. ADAMS, Washington Association, Presiding

8:45 *A.M.*—Motion Picture

9:00 *A.M.*—Door Prize Drawing

9:15 *A.M.*—Report of Committee on Membership
MR. H. L. TEMPLETON, *Chairman*
Director Quality Control Laboratories
Fairmont Foods Corp., Omaha, Nebraska

9:30 *A.M.*—"Q-Fever Studies."
DR. JOHN B. ENRIGHT
School of Veterinary Medicine
University of California
Davis, California

10:00 *A.M.*—"Report of the Committee on Baking Industry."
VINCENT T. FOLEY, *Chairman*
Kansas City Health Dept.
City Hall, Kansas City, Missouri

10:15 *A.M.*—"Some Field Trial Studies with a Detergent-Sanitizer in the Sanitization of Milking Utensils." DR. MARVIN L. SPECK, *Professor*, Dairy Bacteriology
North Carolina State College
Raleigh, North Carolina

10:45 *A.M.*—"Suggested Requirements for the Production of Milk and Cream for Manufacturing Purposes."
A Report of the Committee on Ordinances and Regulations
MR. C G. LEONARD, *Chairman*
South Carolina State Board of Health
Columbia, S.C.

11:00 *A.M.*—"Flavor Defects in Milk and Their Relationship to Farm Holding Tanks."
PROFESSOR C. C. PROUTY
Department of Dairy Science
Washington State College
Pullman, Washington

11:35 *A.M.*—"Sanitation Problems in the Manufacture of Cottage Cheese."
PROFESSOR J. C. BOYD, *Department of* Dairy Husbandry
University of Idaho
Moscow, Idaho

LUNCHEON ADJOURNMENT

FRIDAY AFTERNOON — SEPTEMBER 7, 1956

HAROLD S. ADAMS, *President IAMFS*, Presiding

1:45 *P.M.*—Movie

2:00 *P.M.*—Door Prize Drawing

2:15 *P.M.*—Business Meeting
Report of Executive Secretary MR. H. L. THOMASSON, Shelbyville, Indiana
Report of Secretary-Treasurer DR. H. H. WILKOWSKE, University of Florida, Gainesville, Florida
Committee Reports:
Report of Resolution Committee
MR. JOHN D. FAULKNER, *Chairman*
Election of Officers
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NEWS AND EVENTS

HELPFUL INFORMATION

Editorial Not: Listed below are sources of information on a variety of subjects. Requests for any of the material listed may be sent by letter or postcard to the sources indicated.

Milk control programs of the Northeastern States Milk Administrator. Part II. Bulletin 918, November, 1955. Cornell Agricultural Exp. Sta., Ithaca, N.Y. Northeast Regional Publication No. 23 by Leland Spencer and S. K. Christensen.

Soft water. A booklet. Kisco Boiler and Engineering Co., 2400 Deralb St., St. Louis 4, Mo.

"Hyla" process of water purification. A pamphlet. Hyla Food Industry Research and Sales, Inc., 43 North Moore St., New York 13, N. Y.

Sanitation guide for food and drink concessions at fairs, circuses and carnivals. An illustrated circular for instruction of personnel at migrant food handling operations. New Mexico Department of Public Health, Dept. J.M.F.T., Santa Fe, New Mexico.

Victor chemicals victafile for the food and beverages industry. Available from the Victor Chemical Works, 155 N. Wacker Drive, Dept. J.M.F.T., Chicago 6, Ill.

Egg grading manual No. 10BB — Catalogue No. A 1.76:75, 35 cents. Superintendent of Documents, Washington, D.C.

Can we solve the farm problem? M. R. Benedict. A book, 601 pages, $5.00. The Twentieth Century Fund, 330 W. Forty Second At., New York 36, N.Y.

Units of weight and measure. A bulletin, definitions and tables of equivalents, National Bureau of Standards Miscellaneous Publication 214, 64 pages, 40 cents. Superintendent of Documents, Washington, D.C.

Plant rubbish removal systems. Bulletin 104. Morse Boulger Destructor Co., Dept. J.M.F.T., 80 Fifth Ave., New York 11, N.Y.

A second digest of information on allethrin and related compounds. A bulletin. U.S. Dept. of Agriculture, Agriculture Research Service, Dept. J.M.F.T., Washington 25, D.C.

Spraying systems. Bulletin No. 76. Spraying Systems Co., Dept. J.M.F.T., 3201 Randolph St., Bellwood, Ill.

Price support programs and how they work. Special circular on economic information, Vol. 26, No. 6, De-

cember 1955. College of Agriculture, Madison, Wisc.

First Wisconsin Conference on Intrastate Milk Shipments. Report of conference held at Oshkosh, Wisc., Sept. 27, 28, 1955. Available from Karl Mohr, Chairman of Conference, Green Bay Health Dept., Green Bay, Wisc.

American standard national plumbing code — ASA — A40.8. A book, 186 pages, $3.50. American Society of Mechanical Engineers, 29 West 39th St., New York, N. Y.

Introduction to parasitology: with special reference to the parasites of man. Asa C. Chandler. A book, 799 pages, $8.50. John Wiley and Sons, 440 Fifth Ave., New York, N.Y.

Scientific analysis of flavor and odor. A booklet, 8 pages. Evans Research and Development Corp., 250 East 43rd St., New York 17, N. Y.

Technical bulletin on sorbicacid and its uses in foods, No. 6568. Union Carbide and Carbon Chemicals Co., 30 East 42nd St., New York 17, N. Y.

Regulations affecting the movement and merchandising of milk. (Marketing Research Report No. 9B). Bulletin. U.S. Dept. of Agriculture, Washington 25, D. C.

Anthrax. Farmer's Bulletin No. F 1736, revised. 15 cents. Superintendent of Documents, Washington, D. C.

Improved handling of frozen foods in retail stores. Marketing Research Report No. MRR 104, 20 cents. Superintendent of Documents, Washington, D. C.

Rinoerpest. A movie, 16 mm., sound and color, 18 minutes. Available for loan from Extension Service and State College Film Libraries in chief livestock producing states.

Marketing eggs. Catalogue No. A 1.9:1378/7. 25 cents. A bulletin outlining and reviewing methods relating to quality. Superintendent of Documents, Washington, D. C.

A study of the milk market of Memphis, Tennessee. Bulletin No. 242, May 1955. Bulletin Room, Agric. Exp. Sta., University of Tennessee, Knoxville, Tenn.

How does cleaning rate on your farms? A circular. The Diversey Corp., 1820 Roscoe St., Chicago 13, Ill.

Policy statement on artifical sweeteners. A circular. Food and Nutrution Board, National Research Council, 2101 Constitution Ave., Washington 25, D. C.

Effects of certain insecticides in soil on crop plants. Catalogue No. Al;36;1121, A bulletin, 30 cents. Superintendent of Documents, Washington, D. C.

Food buying guide for type A school lunches. Catalogue No. A. 1.68:270. A Bulletin, 25 cents. Superintendent of Documents, Washington, D. C.

Water. The yearbook of Agriculture, 752 pages, $2.00. 1955. Superintendent of Documents, Washington, D.C.

Evaluating your personnel management. Catalogue No. CS 1.54:6. A bulletin, 35 cents. Superintendent of Documents, Washington, D. C.

Official methods of analysis of the association of official agricultural chemists. A book, eighth edition, 1008 pages, $12.00. 1955. Association of Official Agricultural Chemists, P. O. Box 540, Benjamin Franklin Station, Washington, D. C.

Health aspects of pest control. Manuscripts, 49 pages, $2.00. 1955. School of Public Health, University of Michigan, Ann Arbor, Mich.

Methods, equipment and facilities for receiving, ripening and packing bananas. Marketing report No. 92, 127 pages, 65 cents, U S.D.A., Superintendent of Documents, Washington, D.C.

PHS SANITARY ENGINEERING RESEARCH GRANTS

A summary of research grants in sanitary engineering approved by the Public Health Service between July 1 and December 31, 1956, has been released by the Public Health Service, U.S. Department of Health, Education, and Welfare. These grants, like all research grants of the Public Health Service, are administered through the Division of Research Grants, National Institutes of Health. Grants in the field of sanitary engineering are made on the recommendation of the Study Section on Sanitary Engineering and Occupational Health.

A tabulation of these sanitary engineering research grants, made primarily to universities and other research institutions throughout the country, follows:

Field	No. of Grants New	Continuing	Total
Water pollution and treatment	10	14	$195,688
Sewage and industrial wastes	14	5	207,348
Community air pollution	7	5	322,480
Other sanitary engineering projects	5	2	86,920
Occupational health	3	2	63,978
	39	28	$876,414

Increased interest in sanitary engineering research

grants is evidenced by the growing number of applications now being received by the Sanitary Engineering and Occupational Health Study Section. Further information on the 67 active grants, including the names of the investigators, institution, and amounts of support, may be obtained from the Division of Sanitary Engineering Services, Public Health Service, U.S. Department of Health, Education, and Welfare, Washington 25, D. C.

DAIRY PLANT INSIDE WORKERS SCHOOL SPONSORED BY DUPAGE COUNTY HEALTH DEPARTMENT

Editorial Note: The following is an account of the type of instructional meeting which generates interest and enthusiasm among management, employes and milk control officials. Our congratulations to Mr. Walter Foote, Milk Sanitarian, DuPage County Health Deparment, Wheaton, Illinois, under whom this educational program was organized.

The idea for an educational program in connection with milk inspections in this area was originated some time ago. A school for inside workers in dairy plants under the inspection of this department seemed to promise certain benefits to the Grade A milk program. It seemed to us that if the workers could be assured of receiving a substantial amount of information concerning better ways to do their job and the reasons for the many regulations and requirements in milk processing, they would be willing to spend time to attend a meeting.

It also appeared that if plant owners could be interested in such a meeting it would bring about improved understanding of their work by employees, and save time and material in operation. Furthermore, the regulatory agency could anticipate an inprovement in quality of products, resulting from a better knowledge by workers of improved methods of operation.

The plant owners and managers were approached and asked to consider the program. Employees were also consulted and asked for their opinion. Members of both groups expressed their belief that such a program would be "a good thing". The plant owners were asked to attend a meeting at the Health Department offices to discuss the school and lay plans for a program. After discussion, it was decided that two evenings would be necessary to present the proposed material. Dates were decided on and the owners, of their own accord, decided that the second meeting should be a dinner meeting, to be announced at the close of the first meeting. Needless to say, this arrangement later proved very popular with the plant workers.

The first of these meetings was held at DuPage County Health Department building in Wheaton, Illinois, March 8, 1956 and was purely a school meeting. The men were only promised an opportunity to learn more about their profession. Their response was most gratifying and nearly 100% attended.

A moving picture "You and Your Job" was shown which served to outline the subject matter of the school. Two speakers spoke on subjects close to processing work. Mr. J. C. McCaffrey, Chief of Laboratories, Illinois State Health Department, lectured on basic bacteriology applied to milk handling and storing. This speaker has the faculty of making his audience see the "bugs" grow and divide.

Mr. R. B. Barrett, Chief Chemist, Klenzade Company, Beloit, Wisconsin, spoke on the chemistry of cleaning and sanitizing. With the aid of visual demonstration, Mr. Barrett "accomplished the impossible" and made this very technical subject clear to an audience of laymen. An opportunity was given the workers to ask questions after the talks.

At the close of the meeting it was announced that the next meeting would be held at a restaurant and a steak dinner for all would be served with the plant owners as hosts.

This meeting was held on March 13, 1956 in Addison, Illinois. After dinner the audience listened to a lecture by C. A. Abele of Diversey Corporation on "The Mechanics of Cleaning and Sanitizing". This was a very interesting and practical talk on the subject, as evidenced by lively discussions of the workers in their plants for days after the meeting.

Mr. P. E. Riley of Illinois Department of Public Health gave a very interesting talk on "Why Inspections Are Made and What They Mean". This was a very fine talk on the reasons back of inspections and the marks on inspection sheets.

We believe that these meetings were of substantial benefit to all concerned. The time and effort which was required to organize and carry out the program was well repaid. The workers were given information which we are convinced will result in improvement in the products which they handle.

The cooperation of the management and the workers with this department certainly is evidence of their desire to improve their methods.

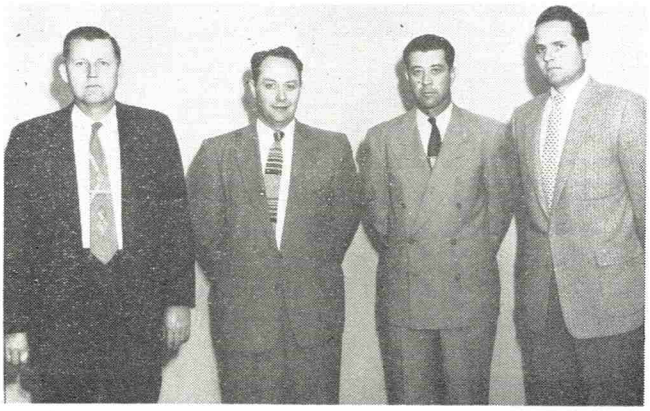
ANNUAL MEETING MISSOURI ASSOCIATION MILK AND FOOD SANITARIANS

One hundred and seventy-seven sanitarians attended the 24th Annual Milk and Food Sanitation Conference held on the campus of the University of Missouri in Columbia this month.

The conference has been sponsored annually by the Department of Dairy Husbandry College of Agricul-

ture, University of Missouri, The Division of Health of Missouri and the Missouri Association of Milk and Food Sanitarians.

At a business meeting of the Missouri Sanitarians, who are affiliated with the International Association of Milk and Food Sanitarians, Bernie Hartman of Kansas City was elected President. Mr. Hartman, who was formerly Senior Sanitarian with the K.C. Health Department is now Secretary of the Greater Kansas City Restaurant Association. Vernon R. Cupps, Dairy



Left to right: John H. McCutchin, Director Bureau Food and Drugs, Mo. Div. of Health, Jefferson City, Sec'y-Treas.; Bernie Hartman, Sec'y. Greater Kansas City Restaurant Ass'n., President; Vernon R. Cupps, Dairy Sanitarian, St. Louis City Health Dept., Lebanon; 1st Vice-Pres.; David Niswonger, Butler County Health Dept., Popular Bluff, 2nd Vice-Pres.

Sanitarian for the St. Louis City Health Department at Lebanon, 1st. Vice-President; David Niswonger, Butler Co. Health Department, 2nd Vice-President and John H. McCutchin, Director of Bureau of Food and Drugs, Missouri Division of Health, Jefferson City, Secretary-Treasurer.

The retiring President is Marvin Campbell, County Sanitarian Cape Girardeau County.

FOOD SCIENTISTS MEETING

Housewives shouldn't expect to go to their market and be able to buy meat that will never spoil, potatoes that will never sprout or artificially flavored food that tastes exactly like the real thing. Science hasn't solved all the problems yet.

This was brought out at a gathering of over one hundred scientists from as far away as South Africa who convened in San Antonio March 15-16 to discuss the latest advances in the selection, handling and processing of food.

The meeting was sponsored by the Institute of Food Technologists and Southwest Research Institute.

The theme which ran through all the speeches was the need for additional research in this new field.

Dr. Ernest W. Reid, chairman of the board of Corn Products Refining Company, said that while 1/3 of the consumer's dollar goes for the purchase of food, only approximately 8% of the chemists in America are engaged in the food industry and the percentage of physicists is much smaller. He called for a program which would bring more scientists to all phases of food research and more students into undergraduate programs in chemistry, physics, food technology and allied subjects.

Food physics is the name given to that branch of the food industry technology which can be developed by physical methods. Previously, chemistry and chemical engineering has been the basis for food technology. With the development of electronics and atomic energy, new opportunities presented themselves to the food industry.

Among these were ultrasonic and irradiation food processing continuous measurement devices, and methods of developing better agricultural products.

Tests now being conducted may result in better cups of coffee and better flavored strawberries. The volatile substances which make flavor are being analyzed to learn their true nature. This will result in better blends and preparation methods in the case of coffee; in developing plants which produce the most flavorful fruit and also in developing better artificial flavors by chemical means as in the case of strawberries.

The protein content of canned meats, cereals and like substances will be specified more accurately if current experiments with nuclear magnetic resonance work out. This device already permits the measurement of the moisture content in corn starch and indications are that it may be adapted for protein measurement.

Irradiation as a means of sterilization and of preserving meats and vegetables for indefinite periods was looked upon as "promising", but the scientists stressed the need for additional research programs in this field.

Ultrasonics, about which much has been written, was said to have been over promoted and under developed. However, speakers agreed this form of food processing by high frequency sound waves, could be applied to such food problems as extracting flavors from vanilla and hops for beer production. Other uses which have been publicized may be economically possible after additional research.

In the future you may be able to be sure a red tomato isn't green inside as the result of a means of shining light through them to reveal the presence of Chlorophyll inside. A similar method can also be used to detect internal blemishes in fruit.

Your smoked ham is more thoroughly smoked and will get even better as the result of electrically charged smoke particles which produce a more even distribution of smoke through the meat and other curing devices have reduced the curing time for bacon 90%.

These are but a few of the innovations discussed by these scientists who gathered at the first international meeting of this new field.

Copies of the proceedings are available from Southwest Research Institute for $5.00. Address C. W. Smith, 8500 Culebra Road, San Antonio.

T. A. EVANS RESIGNS DEPARTMENT POSITION

T. A. "Al" Evans, administrative officer, Health Education Section, has resigned to accept a position as dairy marketing specialist, Extension Service, University of Nebraska.

Evans was first employed with the State Department of Health on June 1, 1942 as chief, Milk and Food Section. From August 1, 1944 until March 31, 1946, he served with the U. S. Navy and was discharged with the rank of lieutenant. Upon completion of military service, Evans returned to his former position with the State Department of Health and was active in the promotion of grade A milk and eating and drinking establishment ordinances in the larger municipalities of the state.

In January 1, 1954, Evans was appointed administrative officer, Health Education Section, the position held at the time of his resignation.

Evans had teaching experience for three years in the Dairy Department, South Dakota State College after receiving his M.S. in dairy husbandry in 1939 and before going to work for the State Department of Health.

During his employment with the health department he was active in state and local affairs. Offices held at the time of his resignation include: state chairman, P.T.A. Health and Summer Round-up; secretary-treasurer, South Dakota Public Health Association; secretary-treasurer, South Dakota Association of Sanitarians; and president, Pierre Lions Club. He is very active in Boy Scout work and was serving as finance chairman, Buffalo District, member, executive Board, Pheasant Council, and; institutional representative, Troop 42, Pierre.

RESEARCH STUDY PROJECT — FOOD SANITATION COMMITTEE

Engineering and Sanitation Section — A.P.H.A.

PURPOSE: To provide a readily available guide of research needs in food sanitation for universities, colleges and other institutions and individuals interested in conducting basic or applied research in the fields of bacteriology, chemistry, engineering, and other allied fields of public health.

OBJECTIVE:

1. To ascertain via survey the areas of food sanitation currently requiring basic and applied research.
2. To evaluate the above survey data and to establish areas of priority for such research.
3. To make available to universities, colleges, and other institutions, as well as individuals, the results and determinations of the committee regarding priority and needs in food sanitation research. Said report is to be made available free of charge.
4. To review on a yearly basis the above report and to re-evaluate the areas of food sanitation demanding and requiring additional or new research in the area of food sanitation.
5. To make available a report such as is indicated above on a continuing (yearly) basis.

PROCEDURES:

1. The preparation of a questionnaire in co-operation with committee members and other specialists in the field of food sanitation, for distribution and completion by persons engaged in food sanitation, programs and activities.
2. The design and the selection of a suitable survey procedure to be followed in the study of this program.
3. A compilation and evaluation of the returned survey forms.
4. Preparation of a written report of the results of the above compilation and evaluation which would be sent to leaders in the field of food sanitation for their review and consideration. In addition to this review by specific individuals, a copy of the preliminary report would be forwarded to the National Institutes of Health for their review and deletion of projects which may overlap into areas already being investigated through grants from the Institutes.
5. Publication and dissemination of the completed report, preferably on a yearly basis, to the various universities and colleges and others who might be interested in engaging in such research.

TIME REQUIRED: It is anticipated that this project will require approximately one year for completion of the original study, plus the necessary reviews and publication.

COST: The cost of this study as well as the publication of the report, can be handled on funds to be made available through sources other than the American Public Health Association.

Please send suggestions and answers to the following questionnaire to: Tom Gable, University of Nebraska, University Health Service, Lincoln 8, Nebraska.

QUESTIONNAIRE ON RESEARCH NEEDS IN FOOD SANITATION

PURPOSE OF PROPOSED RESEARCH:
JUSTIFICATION:
PREVIOUS RESEARCH CONDUCTED IN GENERAL AREA – (List Known References):
TYPE OF RESEARCH INDICATED (Your Opinion):
—Use separate sheet for each proposed project—

STUDY SHOWS RESTAURANT SERVING SURFACES HARBOR BACTERIAL CONTAMINANTS

A study to determine the extent to which the surfaces of restaurant serving tables and counters may harbor bacterial contaminants has just been published by Richard D. O'Neill and Ernest Reed of the Department of Plant Sciences, Syracuse University.

This study was made under grants from the paper place mat and doily industries with the full cooperation of the Commissioner of Health and the Bureau of Food and Sanitation of the City of Syracuse. It was based on samples taken by means of swabs from the surfaces of the counters and tables of ten different types of eating establishments. These were: a bar and grill, public cafeteria, drugstore fountain, variety store fountain, short order house, hotel cafeteria, luncheonette, sea food restaurant, "street-car" diner and a restaurant catering to the college trade. The surface materials at the tables and counters included wood, glass, plastic, linoleum and hard rubber.

Areas of serving surfaces in these establishments, selected at random, were sampled three different days and fifteen different samples were taken upon each visit, making a total of 450 different samples.

In the laboratory, the samples were asceptically transferred to Petri dishes for incubation for forty-eight hours and the colonies which developed were counted on the Quebec colony counter.

The survey disclosed that the occurrence of bacteria on the surface of counters and tables in eating places is highly variable. Counts ranged from zero to over 800,000 per square foot and these counts were found in samples from the same restaurants. However, the incidence of counts in excess of 5,000 per square foot in more than a third of the total number of samples suggest that serving surface contamination may be of more than peripheral sanitary significance, especially since in four of the ten establishments harbored microbes of the coliform group on at least two of the surfaces tested.

Drs. O'Neill and Reed commented on the range in the count of bacterial contaminants as follows: "These extremes were frequently found in samples from the same restaurant taken on the same day. This is not an unexpected finding in view of the enormous number of inconstant factors which can appreciably affect the incidence and survival of microflora on restaurant serving surfaces. It becomes apparent that the occurrence of surface contaminants is a highly unpredictable and to some extent fortuitous thing. The restaurant patron may be served on an essentially sterile surface or a highly contaminated one depending somewhat upon his choice of restaurants but also depending upon the day he may choose to visit a given restaurant and upon the serving surface to which chance may lead him."

An outline of this study, a tabulation of its results and a photographic sequence of the methods used in sampling are presented in "A Survey of Ten Eating Establishments for Bacterial Contamination of Serving Surfaces," which is available without charge from Farley Manning Associates, 270 Park Avenue, New York 17, N.Y., who are handling distribution for the sponsoring groups.

NEW PACKAGE DEVELOPMENT DESIGNED FOR INDIVIDUAL CREAM SERVICE

Cheslam Corporation, Yonkers 2, N. Y., has just introduced a new patented single service liquid package that opens unlimited possibilities for the Dairy Industry. Soon, very soon, pure cream for coffee, cereal, desserts, and other table food items will be available in this new patented, single portion plastic container —packaged at the dairy.

This revolutionary packaging development represents a new trend in prepackaging cream at the dairy level. Food chains and other retail outlets will find this to be a new approach for home consumption and merchandising of cream. Implications of the single service liquid package will affect the dairy and retail field tremendously and immediately.

The keystone to this new packaging development is the patented "Controlled Flow or S-Spout" pouch which functions as a channel sealed into the top

of the plastic pouch. This channel of the controlled spout is opened easily by tearing the partly slit portion along the perforated line across the top, thus exposing the mouth. With the mouth of the spout held downward, slight pressure forces the liquid through the channel and out in a narrow stream. When the pressure is released, passage through the channel is resisted and the flow is stopped completely, even though the pouch is held spout downward.

This not only makes it possible to measure the amount of cream wanted, but prevents wasteful spilling and dripping, and retains the unused contents for future use even when the package is laid on its side. Use of the single portion plastic container with the patented controlled spout is made from a special Cellothene, an extrusion lamination of polyethylene and cellophane, made by the Cheslam Corporation of Yonkers, N. Y. The clear transparency of this film has added features in that it is odorless, tasteless, non-toxic, and resistant to tear, puncture, grease and light. It is chemically inert, flexible at low temperatures, handles easily, and generally not affected by age. Cellothene can be printed by usual processes of Flexographic or Rotogravure. Further advantages of using Cellothene as a container for dairy products and other liquid single service portions is the ease of printing by usual processes of Flexographic or Rotogravure. The polyethylene side of the film is used for the inside of the pouch. The outside surface is cellophane, and this can be printed. If the printing is to be done before the polyethylene is applied, the cellophane could be pre-printed and polyethylene extruded over the printed surface, thus locking the printing between the polyethylene and cellophane. This is known as Cheslock processing, and protects the printed design or message against rubbing off, scratching, lifting, abrasion or marring. Being protected by the cellophane under which it is printed highlights the brilliance and sparkle of the design and message.

Special liquid packaging equipment is available from several manufacturers. These machines form pouches, measure, fill, seal, and deliver in units from one-quarter ounce to three ounces and over. Most important in determining the relative potential possibilities for packaging of cream and single service controlled spout packages at the dairy are:

1. Every pouch is tamper proof.
2. Every pouch is packaged under most sanitary conditions, and every user is assured of these benefits.
3. Every pouch can be printed with dairy name for advertising value.
4. Every pouch can be imprinted with the customer name, distributor, retailer, restaurant, or service for advertising value.
5. Fully automatic liquid packaging equipment is available from several manufacturers.
6. Greater economies can be experienced per service units or pouch as a result in reduction of waste and spoilage, relative cost of packaging material and labor, and the effect of this type of packaging on preservation of quality.

Chain store and retail channels offer additional attractive qualities for the shopper and can bring a zippy merchandising punch to produce sales during so-called "draggy" seasons, and thus become an effective stimulus to increasing the sale of cream all year round.

An interesting feature about cream in single service pouches is that a number, about 20 units, holding 3/4 of an ounce each, could be packed in a compact box and sold as a pint. This box could be stored easily in minimum refrigerator space, and only such amounts that might be used taken out for service, and, in this way, the balance is kept safe and sweet under constant refrigeration for future use.

Preliminary surveys have resulted in enthusiastic anticipation by nationwide chain restaurants, hotels,

airlines, railroads, and other eating establishments. They are vitally interested in this sanitary, easy to handle and use, measured and tamper-proof package which will carry their name on the outside.

The controlled flow spout has been recognized in Washington under patient Number 2707581 and is the exclusive property of the Cheslam Corporation of Yonkers, N.Y.

IMPROVING OUR COLLEGE TEACHING IN THE DAIRY INDUSTRY

The American Dairy Science Association is now in its 50th year and is taking definite steps to broaden its scope of interest and influence. The Association started in 1906 as an organization of university and college instructors—and has had as its main objective the improvement of university and college-trained men in the dairy industry and because of the urgency of the dairy industry for young men with ability to assume industry leadership, the Association is giving renewed attention to this whole question of the education of the professional dairyman.

Last year, the Public Relations Committee of the Association gave specific attention to the matter of secondary school recruitment and counseling and developed a manual which serves as a guide for all branches of the dairy industry which are contemplating local and state-wide recruitment programs. A copy of this manual appeared in the September issue of the JOURNAL (1955) and reprints were made available for general distribution. This year — a special committee of the Association was appointed to deal specifically with the matter of Dairy Education. This committee, headed up by Dr. E. L. Jack of California, is turning its attention to the matter of improvement in curricula of the dairy schools and improvement in teaching methods and techniques. A special session of the Golden Jubilee meeting in Connecticut is being devoted to the subject of "Improving our College Teaching."

The Association recognizes that it has the responsibility to the young college graduate and, consequently, one phase of the Association's program at the present time is the development of a manual which will deal with personnel training and development in the dairy industry. The person heading up the committee for preparing this manual is Prof. H. B. Henderson of the University of Georgia and other members of the committee are H. J. Williams of the Carnation Company, California; N. W. Lamb of the Borden Company, Texas, A. C. Dahlberg of Cornell University; and H. F. Judkins, Secretary-Treasurer of the Association. It is hoped this manual will serve as a guide for training programs which should be adopted and utilized by all branches of the dairy industry for the handling of qualified young men who are looking for a career in the industry.

AGREEMENT REACHED ON STORAGE TANK STANDARD, NEAR ACCORD ON STANDARDS FOR EVAPORATORS, SEPARATORS AT 3-A MEETING APRIL 23-26

An amendment to the 3-A Sanitary Standards for Storage Tanks for Milk and Milk Products was given final approval by the 3-A Sanitary Standards Committees at their regular semi-annual meeting at the Kenwood Country Club, Bethesda, Md., April 23-26.

Additionally, according to Dr. E. H. Parfitt, Chairman of the Executive Committee of the 3-A groups, substantial agreement was reached on 3-A Sanitary Standards for evaporators and vacuum pans, and for separators, standardizers and clarifiers. It was thought

likely that these standards may become official before the next regularly scheduled meetin gof the 3-A groups in December.

The meeting was attended by more than a hundred members of various groups which participate in the 3-A Sanitary Standards from all sections of the country. Participating groups include the Committee on Sanitary Procedures of International Association of Milk and Food Sanitarians; Sanitary Standards Subcommitttee of Dairy Industry Committee (representing users and makers of equipment); and the Milk and Food Program of the U.S. Public Health Service.

"It was one of the best and most productive sessions the 3-A groups have held," said Dr. Parfitt, who also paid tribute to the patience and stamina appled in the reaching of common ground by users and fabricators of dairy equipment and sanitarians and Public Health Service representatives. Many sessions lasted until after midnight, and some of the conferees involved in the late hour sessions were also present for other sessions which got under way at 7:30 the next morning.

Typical of the close attention to detail which goes into all 3-A Sanitary Standards is the disposition accorded to the tentative 3-A Sanitary Standard for Farm Holding and/or Cooling Tanks. This document has so far gone through five revisions, the most recent being dated February 28, 1956. The draft presented at the Kenwood meeting was not acceptable in all details to all of the participants, however, and was sent back to the Farm Tank Task Committee of the Technical Committee of Dairy Industries Supply Association for still further study.

Still another tentative 3-A Standard — this one for fillers and sealers of single service containers for milk and milk products — had its ninth revision presented at the Kenwood meeting, and because one section of it still is not entirely acceptable, it was re-committed to a DISA Task Committee for further revision.

Two other tentative standards — one for freezers of ice cream and frozen desserts and one for coin operated bulk fluid milk and fluid milk products venders — were presented by DISA Task Committees to representatives of processors, who returned the standards to the DISA groups for still further revision before their presentation to sanitarians' representatives.

Guests during one period of the sessions included Wesley E. Gilbertson, Assistant Chief of the Division

of Sanitary Engineering Services, U.S. Public Health Service, within which administrative unit the Milk and Food Program of the Health, Education and Welfare Department operates; and Fred E. McVey, Assistant Chief of the Electric Operations and Loans Division, Rural Electrification Administration, whose pertinent interest is that sufficient electric power become available on farms on which farm bulk milk tanks are installed.

The Executive Committee of the 3-A Sanitary Standards Committees announced that the next semi-annual meeting of the 3-A Committees will be held during the week of December 3rd in a mid-western location which will be announced shortly.

DAIRY BACTERIOLOGY SHORT COURSE

A dairy bacteriology short course will be offered at Penn State University August 13 to 29. The course will include the study of standard methods used in the bacteriological analysis of dairy products. Previous instruction in bacteriology or experience in a laboratory is desirable.

A written and practical examination will be given at the end of the course and will be the basis of certification to the State Department of Agriculture for those wishing to be licensed as Dairy Laboratory Directors.

For more information or to enroll, write to: Director of Short Courses, College of Agriculture, The Pennsylvania State University, University Park, Pa.

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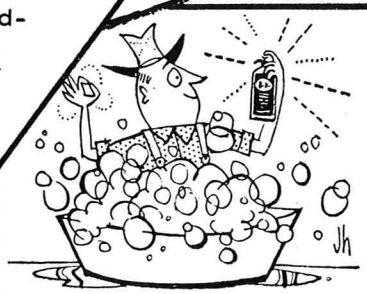

A little BryKo liquid cleaner goes a long way—even in hard-water areas! Use BryKo to put bright sparkle back in dairy equipment—without harming hands, milker rubbers, metal surfaces.

BryKo was developed by Pennsalt—makers of B-K Powder—to give Mr. & Mrs. Dairy Farmer a safe, fast-acting, inexpensive sudsing cleaner.

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