

# TECHNOLOGICAL RESEARCH IN SERVICE LABORATORIES

## Abstracts of Scientific Papers

In making literature surveys of fields in which they are doing research, the scientists of this Service prepare, on file cards, abstracts of a large number of the scientific articles dealing with the subject being studied. These card files have often been of great value to members of the fishery industries, and accordingly, the Service has decided to reproduce the cards from time to time for distribution to interested workers in the fisheries.

The initial series to appear has been prepared by R. Paul Elliott, bacteriologist, Seattle Fishery Technological Laboratory, and is entitled:

### "I. Spoilage of the Protein Fraction of Fish.

#### 1. Microbiological flora in fish, and Sources of . . . and Studies on . . ."

The cards are of standard 3-inch by 5-inch size, one of which is reproduced below as a sample. The material covered is highly technical and will be of interest mainly to specialists.

I	1.2745
Hess, Ernest, 1934	
Effect of temperature on the cell length and shape of <u>Bacillus vulgatus</u> J. Biol. Bd. Can., 1, 109-119	
<p>The mean length of cells of <u>Bacillus vulgatus</u> on slant cultures isolated from halibut intestine showed a rapid initial increase at 37° and 20° C. (4 to 7 hours), followed by a decrease up to 12 to 24 hours. At 37° the second increase occurred in about 9 days, while at 20° a gradual decrease was observed simultaneously with maximum spore production. At 5° C. a single gradual increase in mean length to practically three times normal took place up to 13 days, followed by rapid breaking up of the elongated cells. Separate tests of influence of temperature on the growth of <u>B. vulgatus</u> in nutrient broth and on agar slants seem to indicate that increase in cell length occurred mainly during periods of low growth rate, for example, at 5° during the first 13 days of incubation, and at 37° after 3 days' incubation. Although the comparison of such separate experiments may be questioned, these conclusions are in contrast to the results of Henrici (1923) but agree with Adolph (1931), who pointed out that inhibition of fission causes formation of large individuals and filaments. The least amount of shape modification of cells occurred at 20° at which temperature maximum spore formation took place, the latter interfering, no doubt, with any potential changes in cell shape. At 37° the early death of the cells apparently interfered with the formation of abnormal shapes, and at the 5° temperature, where neither spore formation nor destruction of cells were important factors, and the growth rate was lowest, maximum opportunity for modification of cell shape was given. At this temperature, a large variety of curved and bent forms occurred. In the later stages (after 17 days) many swollen (apparently dead) forms were found.</p>	

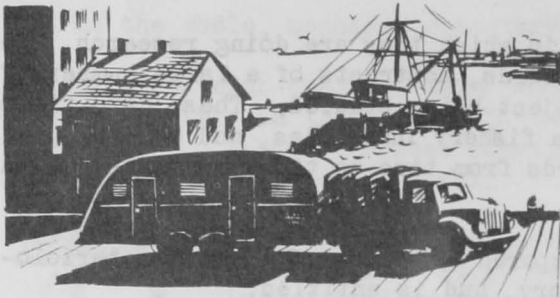
The Roman numeral in the upper left-hand corner indicates the general classification in which the card belongs (in this case, Spoilage of the Protein Fraction of Fish). The Arabic numerals in the upper right-hand corner indicate the general contents of the paper in accordance with a cross-indexing system that has been worked out.

The first series, Spoilage of the Protein Fraction of Fish, is now available upon request from the Fisheries Technological Laboratory, Fish and Wildlife Service, 2725 Montlake Boulevard, Seattle 2, Washington. As indicated above, the supply is limited, and distribution must be restricted to those in the industry who have a genuine need for these cards. New series will be announced in Commercial Fisheries Review as they are completed.

## Boston, Mass.

Experiments were conducted to explore the possibility of using sardine wastes at the canneries. It is believed that the canners would realize a greater profit on waste than they do now, if it could be made into pet food. Several samples of pet food were prepared, but were not satisfactory due to the unavailability of the proper types of cereal.

A paper entitled "A Suggested Tripod for Small Fishing Vessels" was completed and submitted to industry technicians for review.



Final specifications for the mobile laboratory were completed in December, the purchase contract was awarded, and the delivery date was set for the middle of April.



## College Park, Md.

After storage for 10 months, frozen shucked oysters continued to compare satisfactorily with freshly shucked oysters on the basis of palatability tests. The pH values of the frozen stock remained within the usual range for fresh oysters and the loss of weight was negligible. However, the amount of free liquor formed on thawing was quite variable, sometimes being quite large. The tests have aroused considerable interest. Several manufacturers have offered sample packages for testing.

Additional samples of oysters and oyster liquor were tested for salt and dry matter content, and the chitin determinations of crab scrap were concluded.

Twenty-four batches of menhaden oil were refined to reduce their content of free fatty-acids and gum-forming materials and at the same time lighten the color. This refining is aimed at increasing the usefulness of fish oil in paints and varnishes.

The thiamine content of Columbia River salmon is being determined by the rat-growth method.

At the request of the Army, a class of 33 officers was given one week's instruction in fish cookery at the Quartermaster Subsistence Research and Development Laboratory in Chicago.

Preliminary rushes of the motion picture, "Home Cookery of Fish", were completed. Assistance was rendered in the preparation of a teacher's handbook to accompany the film.

Charles D. Briddell, Inc., of Crisfield, Maryland, has made a grant of \$3,500 to the Service for studies on air sterilization, the work to be done at the College

Park Laboratory. A graduate student has been selected to make the investigation. The data will also be used for a masters' thesis in bacteriology at the University of Maryland.

The Service is cooperating with the Crisfield Seafoods Association and the University of Maryland in the development of a program of fishery technological research to be supported by State funds.

Several conferences were held with members of the executive committee of the Atlantic States Marine Fisheries Commission and the Maryland Pollution Control Committee to discuss problems of fishery sanitation and pollution control.

A permanent file has been established to bring together pertinent data dealing with fishery sanitation received from the various Atlantic Coast States. The material is being assembled through the cooperation of various State agencies and the Atlantic States Marine Fisheries Commission.

The first experimental work with a small group of mice fed frozen crabmeat was completed. A second series of mice experiments was started.

Further studies on the possible use of the enterococci as indices of fecal pollution have been made, using the direct plating method and a new enrichment broth. Sampling stations have been marked with buoys in the Crisfield, Maryland, area.



## Seattle, Wash.

A series of experiments was begun to determine the keeping quality of fish precooled and stored at 30-32° F. as compared with iced fish.

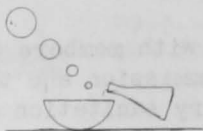
A research program designed to test out several methods of determining the fat content of fish meal was initiated. A comparison of numerous solvents, hot distillation and cold extraction, is being studied.

Plans and specifications are being drawn for the proposed addition to the existing pilot plant for cold-storage tests. The addition will provide space for a substantial cold-storage installation, will house the new trailer laboratory, and will provide a large work room and storage area on the second floor.

Tests were continued on agar extracted from samples of weed harvested at different seasons of the year. The results indicated that weed samples giving the lowest yield were taken during the winter months. Leaf samples gave higher agar yields than stem samples, and sterile specimens were lower in agar content than fertile ones. The higher agar content in summer may be due to a greater degree of branching and to a low proportion of unbranched stems, together with a scarcity of sterile plants.

Tests have been made on the new glass float to determine resistance to pressure, protection from shock, and methods of attaching to lines. A practical operating test of the floats showed that they would not stand the combined hydrostatic pressure and that of the lines when being hauled.

A number of cans of king crab, put up by different commercial canners and under different conditions, were examined at the laboratory. Of particular interest was the fact that crab held in cans without paper liners for several years was in as good condition as that with the regular parchment papers. Some packs showed considerable discoloration, but others were in excellent condition with no visible deterioration.



## Ketchikan, Alaska

The entire staff of the Laboratory cooperated in the preparation of an exhibit, which was displayed at the Creative Arts and Crafts Exhibit in Juneau, Alaska, on January 25, 26, and 27.

A special booklet of 12 selected recipes, chosen on the basis of taste panel records accumulated in recent months, enjoyed a heavy demand.

A collection of all available data on the chemical characteristics of Alaskan fish was begun.



## Mayaguez, Puerto Rico

Laboratory and field tests are being conducted with coco fiber rope to determine break load and percentage of elongation. The rope will be used in commercial fishing operations and tested periodically.

A research program dealing with the economics of the fisheries of Puerto Rico has been started. Wholesalers, retailers, and producers have been interviewed in securing data on costs. A simple statistical form has been devised for the recording of actual production and value.

Thirty-seven samples of "poisonous fish" from the Virgin Islands were examined.

