



BERNARD WERNICK HAMMER

# B. W. HAMMER

## PANEGYRIC

By

His Former Students  
at the Iowa State College



COLLEGIATE PRESS, INC.  
AMES, IOWA  
1937

**COPYRIGHT, 1937, BY  
H. C. HORNEMAN**

*Printed in the United States of America*



TO

BERNARD WERNICK HAMMER

IN APPRECIATION OF HIS WORK IN TEACHING  
AND RESEARCH WE DEDICATE THIS BOOK



## PREFACE

In the spring of 1911 a conference was held on the campus of Iowa State College that proved to be of unusual significance to Iowa and particularly to Iowa's dairy industry. Prof. M. Mortensen, as head of the Department and Section of Dairy Industry, and the writer, as head of the Department and Section of Bacteriology, conferred long and carefully on the general problem of the future of teaching and research in the field of dairy bacteriology. A course of action was charted. It was decided that recommendations should be prepared looking toward securing for Iowa State the best trained, forward-looking young man that could be secured to develop our work in dairy bacteriology. The recommendation was approved by Dean C. F. Curtiss and by Pres. R. A. Pearson.

For our purpose it was highly desirable to secure the right man with the right training from the right school. At that time the list of institutions that could give adequate training was a short one. It did not take long to secure a list of available men who might prove satisfactory. Then came a trip to interview these men.

The man finally selected came from an institution, the University of Wisconsin, with a fine tradition of accomplishment in agricultural research, and eminence, particularly, in bacteriology and in dairying. Men such as Babcock, Russell, Hastings, Ravenel and Frost could not fail to leave their impress on their students. We followed their recommendations and invited B. W. Hammer to head our work at Iowa State College.

Dairy Industry probably exemplifies better than any other department at Iowa State College the motto of the institution, "Science with Practice." With due credit to the cordial backing and assistance of Professor Mortensen and other members of the staff, much of the success in this accomplishment is to be attributed to the point of view, training, ability and energy of Dr. Hammer. He has now served in his present position for 25 years. It is indeed fitting that his success as teacher and investigator should be celebrated by this acknowledgment from students and associates.

Formal tribute to Dr. Hammer's contributions to commercial, educational and research phases of dairying have been prepared by others for this volume. Yet it is appropriate that at least one comment be made here in an effort to diagnose the reasons for Dr. Hammer's success in his chosen field. Foremost has been his insistence upon research which is not superficial but which goes into fundamentals. No progress can be made in the solution of a problem until it has been broken down into its elements.

The kinds of organisms present, the exact chemical changes which they induce, the strict control of environment, the recognition of the complexity of the reactions involved, the stabilization of conditions so that one factor only will vary at a time, the recognition and separation of significant factors—these are among the techniques which have brought success to his research. In teaching we find an unusual ability to classify and organize material, to separate the important from the trivial and to present material in a straightforward manner and in as simple form as the nature of the complex material will permit.

In Dr. Hammer's relationships to industry there has been recognition that there are many varied and important problems to be solved and that the solution of these problems requires the marshalling of all the facts and techniques of all the sciences. In this attempt he has been remarkably successful. He speaks with authority alike to the buttermaker in the creamery and to the dairy bacteriologist in his national gatherings.

Iowa State College wishes to felicitate Dr. Hammer upon the completion of 25 years of service and to insist that what he has thus far accomplished may be but the merest fraction of what he will still be able to accomplish.

R. E. BUCHANAN

Dean of Graduate College, Professor  
and Head of Bacteriology, Iowa State  
College.



# CONTENTS

Preface . . . . .	vii
-------------------	-----

## TRIBUTES TO BERNARD WERNICK HAMMER

Biography	
HENRY GILMAN, <i>Iowa State College</i> . . . . .	1
A Tribute from Associates	
M. MORTENSEN, <i>Iowa State College</i> . . . . .	3
A Tribute from Education and Research	
E. G. HASTINGS, <i>University of Wisconsin</i> . . . . .	5
A Tribute from the Industry	
H. C. HORNEMAN, <i>Sugar Creek Creamery Company, Danville, Illinois</i> . . . . .	7
Publications of B. W. Hammer, 1909-1935 . . . . .	9
Students Receiving Master of Science and Doctor of Philosophy Degrees Under Bernard Wernick Hammer . . . . .	15

## SCIENTIFIC TREATISES IN HONOR OF BERNARD WERNICK HAMMER

Further Observations on the Quantitative Changes in the Microflora of Cream and Butter During Manufacture, Storage and Shipment	
H. MACY, <i>University of Minnesota</i> . . . . .	19
Churn Contamination as a Source of Yeasts and Molds in Butter	
W. A. CORDES, <i>Blue Valley Creamery Company, Chicago, Illinois</i> . . . . .	31
A Comparison of Media for Determining the Total Bacterial Count of Butter	
A. H. WHITE, <i>Division of Dairy Research, Ottawa, Canada</i> . . . . .	49
Some Observations on the Yeast and Mold Count of Salted Butter Made from Sour Cream	
E. H. PARFITT, <i>Purdue University</i> . . . . .	61
The Influence of Filtration of Inoculated Wash Water on Bacterial Count and Keeping Qualities of Butter	
H. C. OLSON, <i>Iowa State College</i> . . . . .	65
A Method for the Microscopic Examination of Butter	
R. V. HUSSONG, <i>Sealtest System Laboratories, Inc., Danville, Illinois</i> . . . . .	73
The Influence of Starter on the Flavor of Butter	
G. H. WILSTER, <i>Oregon State College</i> . . . . .	75
The Influence of Various Methods of Neutralizing Cream on the Quality of Fresh and Stored Butter	
CHRIS JENSEN, <i>North Dakota State College</i> . . . . .	83

A Comparative Study of Mississippi and Minnesota Butter from the Standpoints of Certain Fat Constants and Heat Resistance	
F. H. HERZER, <i>Mississippi State College</i> . . . . .	93
The Manufacture of High-Scoring Butter	
N. E. FABRICIUS, <i>Iowa State College</i> . . . . .	99
The Effect of Certain <i>Penicillia</i> on the Volatile Acidity and the Flavor of Iowa Blue Cheese (Roquefort Type)	
C. B. LANE, <i>Iowa State College</i> . . . . .	107
Methods Used to Increase Blue Mold Growth in Cheese	
N. S. GOLDING, <i>University of Washington</i> . . . . .	113
The Effect of <i>Penicillium roqueforti</i> on Some Lower Fatty Acids	
H. W. BRYANT, <i>Iowa State College</i> . . . . .	119
The Influence of Certain Bacteria on the Ripening of Cheddar Cheese Made from Pasteurized Milk	
HENRY C. HANSEN, <i>University of Idaho</i> . . . . .	123
Curing Small Units of American Cheese in Liquid Paraffin	
E. F. GOSS, <i>Iowa State College</i> . . . . .	133
A Study of Some of the Physical Changes Involved in the Rennet Coagulation of Milk and the Subsequent Firming of the Curd	
H. A. BENDIXEN, <i>Washington State College</i> . . . . .	135
Physical and Chemical Effects of Homogenization of Milk	
G. MALCOLM TROUT, <i>Michigan State College</i> . . . . .	141
Distribution of Bacteria in a Quart Bottle of Whole Milk Held at 0° C.	
J. B. STINE, <i>Kraft-Phenix Cheese Corporation, Wausau, Wisconsin</i> . . . . .	155
Influence of Growth Temperature on the Thermal Resistance of Some Aerobic, Spore-forming Bacteria from Evaporated Milk	
D. R. THEOPHILUS, <i>University of Idaho</i> . . . . .	161
The Influence of Growth Temperature and Age on the Thermal Resistance of Milk Cultures of <i>Streptococcus lactis</i>	
T. J. CLAYDON, <i>Iowa State College</i> . . . . .	177
The Limitations of Significance of Some of the Methods of Analyzing Ice Cream	
A. C. FAY, <i>Kansas State College</i> . . . . .	185
Studies on <i>Bacillus coagulans</i>	
W. B. SARLES, <i>University of Wisconsin</i> . . . . .	193
Bacteria of the <i>Escherichia-Aerobacter</i> Group in Dairy Products	
M. W. YALE, <i>New York (Geneva) Agricultural Experiment Station</i> . . . . .	197
Observations on <i>Alcaligenes lipolyticus</i>	
H. F. LONG, <i>Iowa State College</i> . . . . .	209

Studies on <i>Lactobacillus</i> Cultures That Actively Coagulate Milk HARRY H. WEISER, <i>Ohio State University</i> . . . . .	215
Determination of Acetylmethylcarbinol and Diacetyl in Dairy Products MICHAEL B. MICHAELIAN, <i>Iowa State College</i> . . . . .	223
A Study of the Distribution of Strains of <i>Streptococcus lactis</i> Which Are Sensitive to a Filterable Inhibitory Principle from Slow Starters F. EUGENE NELSON, <i>University of Minnesota</i> . . . . .	241



**B. W. HAMMER**  
**PANEGYRIC**



---

---

*Tributes*  
*to*  
*Bernard Wernick Hammer*

---

---

