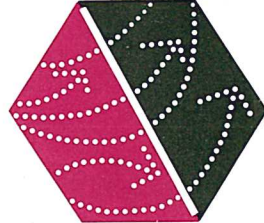
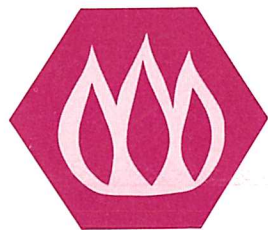


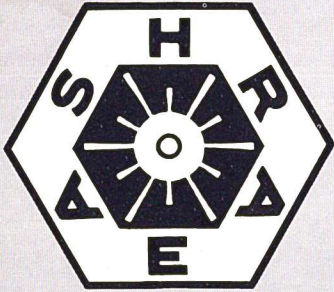
ANNUAL REPORT



1961/1962

AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS, INC.





CONTENTS

3. GROWTH AND CHANGE by President J. H. Fox
4. INTERNATIONAL RELATIONS
NATIONAL ACTIVITIES
5. PUBLICATIONS • STANDARDS • MEMBERSHIP
6. MAP SHOWING ASHRAE CHAPTER AND
REGIONAL BOUNDARIES
7. HONORS AND AWARDS • EDUCATION
8. RESEARCH PROGRAM
12. PUBLIC RELATIONS, ADVERTISING AND
SALES PROMOTION
13. OFFICERS • BOARD OF DIRECTORS
STAFF PERSONNEL • ADMINISTRATION
14. FINANCIAL STATEMENT

GROWTH AND CHANGE

Growth and change . . . the pattern that has been characteristic of ASHRAE and its predecessor societies since their inception 68 years ago . . . were unusually dominant in Society activities during the 1961-62 fiscal year (July 1, 1961 to June 30, 1962).

This has been a year of analysis and planning for the future. Proud of our past accomplishments in the engineering profession and in our chosen fields of technology, we have sought—and are continually seeking—new challenges in order to improve our services to members, to industry, and to the public. Under the leadership of President John Everetts, Jr., the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) has had a prosperous and pace-setting year. Mr. Everetts was the first ASHRAE president since the merger of our two predecessor societies in 1959 to serve a full-year term.

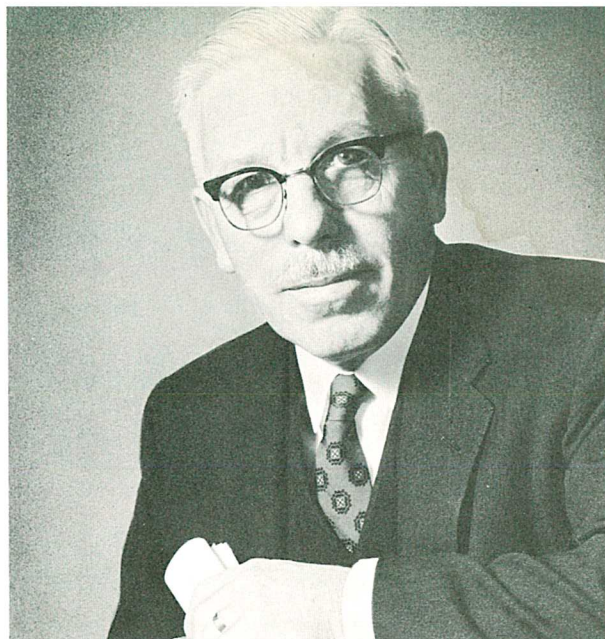
Since September 1961, the staff—with the exception of the midwest advertising representative—has been headquartered in the new United Engineering Center. In the spring of 1962, a professional survey of staff functions and procedures was made and, as a result, a number of changes were implemented. Today's complement of 39 personnel is performing at a high degree of efficiency.

In the area of research, ASHRAE sponsored 16 widely diversified projects, all performed through cooperating institutions. In the past, we maintained a laboratory and divided our research program between our laboratory-conducted projects and grants-in-aid for research to colleges and private facilities. The success of the 1961-62 program is affirmed in the expansion of cooperative research activities for 1962-63. We are currently spending \$135,345 on direct research, a 36 per cent increase over our grants for the last fiscal year.

ASHRAE, the sixth oldest engineering society in the United States, is today also the sixth largest, with a membership of approximately 18,000. The number of chapters in the U.S. and Canada grew from 88 to 95, a solid indication of a healthy organization. Consideration is now being given to the formation of seven additional chapters, raising our total number to more than 100.

ASHRAE's participation in international affairs was sharply intensified. We now have seven overseas affiliates . . . in France, Switzerland, Mexico, the Philippines, Australia, New Zealand and Argentina. Six per cent of our members reside in 61 overseas countries. Three important international highlights were: attendance of the ASHRAE Associate Secretary and members at the London meeting in February of the International Organization for Standardization (ISO); the ASHRAE-sponsored U.S. lecture tour in April of Dr. Rudolf Plank, world-renowned refrigeration authority from Karlsruhe, Germany; and, in August, the first U.S. meetings of Commissions of the International Institute of Refrigeration, held in Washington, D.C. Many ASHRAE members were present at these meetings.

Careful appraisal was made of the organization of the Society officers and board of directors. A vote by the membership on the board's recommendations for reorganization will be polled at the forthcoming Semiannual Meeting of the Society in February 1963. Also, the "image" of the Society came in for its share of scrutiny



as an integral part of ASHRAE's developing public relations program.

Our financial position remained stable and secure despite a decrease in advertising revenues. As of July 1, 1962, ASHRAE eliminated allocations to chapters in support of their basic operations; chapter income is now derived chiefly from member local dues, and seminars. An increase in national membership dues, effective July 1, 1961, has helped to offset inflationary operating costs.

In line with recommendations of our auditors, the previous Pension Fund of the Society has been reorganized by the transference of monies, in part to Pension Fund trustees and in part to an insurance company which will be the repository for such funds.

The Capital Assets Fund (furniture and fixtures at staff headquarters) has been discontinued and distribution has been made in the proper proportions to the Society Research and General Funds. Under this arrangement, ASHRAE has been relieved of accounting for fixed or frozen assets.

The GUIDE AND DATA BOOK began its two-volume series in September 1961 with the publication of Volume I—FUNDAMENTALS AND EQUIPMENT. Volume II—APPLICATIONS appeared in August 1962. This series, each volume of which is brought up-to-date and reissued every other year, is an enormously useful tool in the fields we serve. The ASHRAE JOURNAL, our official monthly publication, is vigorous and growing. New policies, initiated in part by new personnel and under the guidance of the Publications Committee, have added some fresh, welcome ideas. Significantly, non-member sales and subscriptions of these publications increased seven per cent over the past year.

I am grateful for the opportunity of serving as ASHRAE President during this exciting period of challenges and new accomplishments. I pledge my continued best efforts during the remainder of my term in office. It is my hope that you read this report carefully, so that you may be aware of the affairs and activities of ASHRAE.

A handwritten signature of John H. Fox in dark ink.

John H. Fox, President

INTERNATIONAL RELATIONS

In the area of international affairs, probably the most significant accomplishment was the affiliation with ASHRAE of seven overseas societies engaged in our fields of activity. These affiliates are:

Asociacion Argentina del Frio (Buenos Aires)

Asociacion Mexicana de Ingenieros en Calificación y Aire Acondicionado (Mexico City)

Association des Ingénieurs de Chauffage et de Ventilation de France (Paris)

Australian Institute of Refrigeration, Air Conditioning and Heating (Melbourne)

New Zealand Institute of Refrigeration (Wellington)

Philippine Air Conditioning and Refrigerating Engineers Society (Manila)

Schweizerischer Verein von Wärme-und Klima-Ingenieuren (Berne)

This decision to welcome qualifying overseas national societies as affiliates—by recommendation of the Society's International Relations Committee and approval of the Board of Directors—expresses ASHRAE's desire to broaden its scope of activities in the free world and thereby make possible a more effective and fruitful exchange of knowledge and ideas among kindred engineers. Additional overseas affiliates are expected during 1962-63.

In August 1962, 59 delegates from 18 foreign countries, in addition to 155 U.S. representatives, attended the first convocation in the United States of the International Institute of Refrigeration (IIR). An eminent role was played by ASHRAE members in support and leadership of the meetings of the five IIR Commissions in Washington, D.C.

Established as an intergovernmental body in 1920, IIR promotes the utilization of refrigeration and allied cooling processes on an international scale by means of scientific, technical and economic researches, centralizing of information, promotion of refrigeration knowledge, publication of papers and documents in the field, standardization of refrigeration technology, and regulations and the organization of international congresses.

Represented by the U.S. National Committee for the International Institute of Refrigeration, a department of the National Academy of Sciences-National Research Council, the United States has been a member of IIR since 1956. The National Research Council has accepted membership and participation in the IIR with the cooperation and financial support of U.S. scientific and technical societies, including ASHRAE . . . 18 members of which are members of the U.S. National Committee.



IIR delegates are photographed in front of the United Engineering Center during their visit to New York, prior to the Washington meetings.

NATIONAL MEETINGS

ASHRAE held two annual meetings during 1961-62.

At the Semiannual Meeting in St. Louis, January 29-February 1, 1962, total attendance reached 964. Forty-four technical session and symposium papers were read at the four technical sessions and seven symposiums. In addition, there were five forums for informal and off-the-record discussion.

Registration at the 69th Annual Meeting, June 25-27, 1962, in Miami Beach, was 547. There were three technical sessions and five symposiums at which 37 papers were given, and six forums. Officers for the 1962-63 fiscal year were elected and installed and honors and awards were presented.

All technical session papers from both annual meetings have been published in the ASHRAE Journal, as

well as many of the symposium papers.

In November 1961, ASHRAE participated in a joint session with the American Society of Mechanical Engineers (ASME) on the general subject of psychrometry and in special observance of the 50th anniversary of the development of the rational psychrometric formulae as published by the late Dr. Willis H. Carrier.

The Society's Semiannual Meeting, February 11-14, 1963, in New York City, will be held concurrently with the 16th International Heating and Air-Conditioning Exposition, sponsored by the ASHRAE membership.

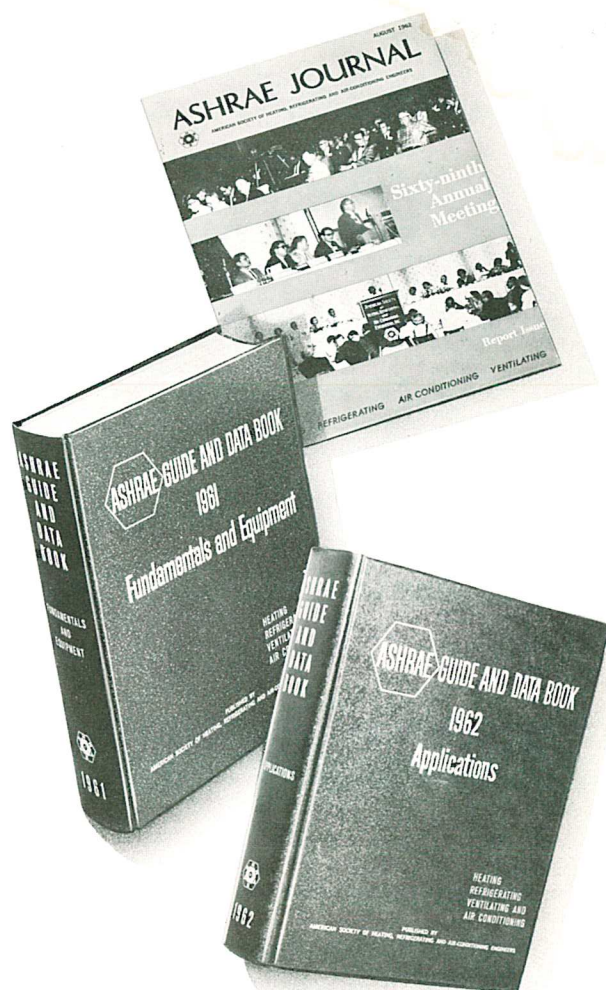
In May, ASHRAE will participate in the 1963 International Symposium on Humidity and Moisture Measurement and Control in Science and Industry, to be held in Washington, D.C.

PUBLICATIONS

Since 1922, when the first predecessor of the Guide And Data Book was published, there has been only one acknowledged technical "bible" in the heating, refrigerating, air-conditioning, ventilating and allied fields. In 1961, information formerly contained in the predecessor "Air Conditioning Refrigerating Data Book" and in the "Heating Ventilating Air Conditioning Guide" was incorporated into a new two-volume series... the ASHRAE Guide And Data Book, each volume revised in alternate years.

The Guide and Data Book is not a "textbook" in the classroom sense, but is a guide to current engineering practice. The 1961 volume on Fundamentals and Equipment—to be reissued in 1963—has information on theory; fundamentals; new equipment; use, performance and rating of equipment; and definitions of engineering terms and symbols. The 1962 Applications volume contains chapters on engineering systems; system design; applications; requirements of various buildings or processes as they effect a particular system; and cost factors.

In late 1961 and throughout the first half of 1962, there were substantial alterations in the format, type faces, and over-all "image" of the Journal, the Society's official monthly publication. The cover logotype was redesigned and articles were grouped into designated categories. Improvement was not confined to facade only but in more extensive coverage inclusive of research, industrial, application, education and international news and articles thus meeting more effectively the needs and requirements of member and non-member readers on all levels of interest.



STANDARDS

Probably no ASHRAE activity or accomplishment has a more direct influence upon living conditions than Standards—established to assist industry and the general public by offering a uniform method of testing equipment for rating purposes, by suggesting safe practices in designing and installing equipment and by providing proper definitions of equipment.

The principal Standard published by the Society in 1961-62 was designated 36-62, "Measurement of Sound Power Radiated from Heating, Refrigerating and Air-Conditioning Equipment." This Standard provides a basis for comparison among the available equipment and also for estimating the sound pressure level to be obtained from the equipment in a given space. Moreover, it will serve as a basis for subsequent ASHRAE Standards on sound characteristics for specific types of equipment.

At the February 1962 meeting in London of the International Organization for Standardization (ISO), ASHRAE Standard 16-61, "Testing for Rating Room Air Conditioners" was submitted as the basis of a U.S. proposal. This Standard is now being revised and will be presented at the 1963 meeting.

MEMBERSHIP

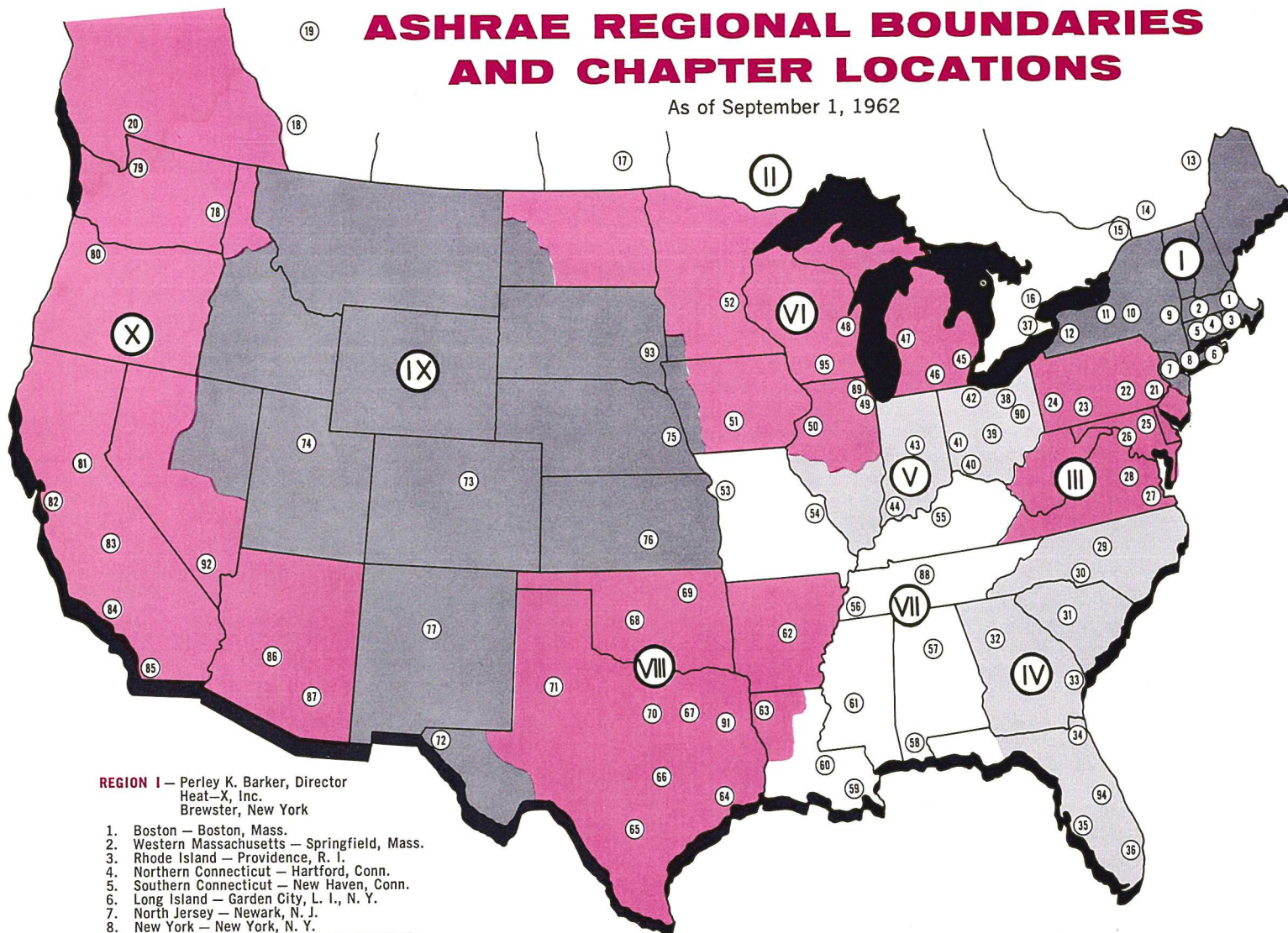
In 1961-62, ASHRAE increased its number of chapters in the U.S. and Canada from 88 to 95. This 13 per cent increase in the number of chapters was accompanied by a four per cent increase in total membership. As of June 30, 1962, ASHRAE membership was 18,349.

Partial credit for this increase was due to the Membership Development Campaign which was launched in September 1961. Although the goal—to increase the over-all membership by 10 per cent—was not achieved, 47 chapters did enroll new members and four chapters... Savannah, Shreveport, Central New York and Southern California... exceeded their assigned quotas. Under the direction of the Membership Development Committee, the Campaign is continuing through 1962-63.

Reissued in 1962 was the Society's Membership Roster, for the personal use of all members. A "Who's Who" in ASHRAE, it lists alphabetically all registered members, their business addresses and titles, home addresses, grades of membership, and other pertinent information.

ASHRAE REGIONAL BOUNDARIES AND CHAPTER LOCATIONS

As of September 1, 1962



REGION I — Perley K. Barker, Director
Heat-X, Inc.
Brewster, New York

1. Boston — Boston, Mass.
2. Western Massachusetts — Springfield, Mass.
3. Rhode Island — Providence, R. I.
4. Northern Connecticut — Hartford, Conn.
5. Southern Connecticut — New Haven, Conn.
6. Long Island — Garden City, L. I., N. Y.
7. North Jersey — Newark, N. J.
8. New York — New York, N. Y.
9. Northeastern New York — Albany, New York
10. Central New York — Syracuse, N. Y.
11. Rochester — Rochester, N. Y.
12. Niagara Frontier — Buffalo, N. Y.

REGION II — John H. Ross, Director
1251 Yonge Street
Toronto 7, Ontario
Canada

13. Chapitre de la Ville de Quebec — Quebec City, P.Q.
14. Montreal — Montreal, P.Q.
15. Ottawa Valley — Ottawa, Ont.
16. Ontario — Toronto, Ont.
17. Manitoba — Winnipeg, Man.
18. Southern Alberta — Calgary, Alta.
19. Northern Alberta — Edmonton, Alta.
37. Niagara Peninsula — Hamilton, Ont.

REGION III — Earle K. Wagner, Director
Powers Regulator Co.
1400 Willow Ave.
Philadelphia 26, Pennsylvania

21. Philadelphia — Philadelphia, Pa.
22. Central Pennsylvania — Harrisburg, Pa.
23. Johnstown — Johnstown, Pa.
24. Pittsburgh — Pittsburgh, Pa.
25. Baltimore — Baltimore, Md.
26. National Capital — Washington, D. C.
27. Hampton-Roads — Norfolk, Va.
28. Richmond — Richmond, Va.

REGION IV — Allen C. Gowdy, Director
Gowdy & Durkin, Inc.
PO Box 5027
Atlanta 2, Georgia

29. North Piedmont — Greensboro, N. C.
30. South Piedmont — Charlotte, N. C.
31. South Carolina — Columbia, S. C.
32. Atlanta — Atlanta, Ga.
33. Savannah — Savannah, Ga.
34. Jacksonville — Jacksonville, Fla.
35. Florida West Coast — Tampa, Fla.
36. South Florida — Miami, Fla.
94. Central Florida — Orlando, Fla.

REGION V — William Taylor, Director
The Ebcro Manufacturing Co.
265 North Hamilton Road
Columbus 13, Ohio

38. Cleveland — Cleveland, Ohio
39. Columbus — Columbus, Ohio
40. Cincinnati — Cincinnati, Ohio
41. Dayton — Dayton, Ohio
42. Toledo — Toledo, Ohio
43. Central Indiana — Indianapolis, Ind.
44. Evansville — Evansville, Ind.
90. Akron — Akron, Ohio

REGION VI — Prof. Axel Marin, Director
University of Michigan
Mech. Engrg. Dept.
Ann Arbor, Michigan

45. Michigan — Detroit, Mich.
46. Central Michigan — Battle Creek, Mich.
47. Western Michigan — Grand Rapids, Mich.
48. Wisconsin — Milwaukee, Wis.
49. Illinois — Chicago, Ill.
50. Illinois-Iowa — Moline, Ill.
51. Iowa — Des Moines, Iowa
52. Minnesota — Minneapolis, Minn.
89. Chicago — Chicago, Ill.
95. Madison — Madison, Wis.

REGION VII — Burt Lomax, Jr., Director
Lomax, North & Beasley
Box 1662
Jackson, Mississippi

53. Kansas City — Kansas City, Mo.
54. St. Louis — St. Louis, Mo.
55. Louisville — Louisville, Ky.
56. Memphis — Memphis, Tenn.
57. Birmingham — Birmingham, Ala.
58. Mobile — Mobile, Ala.
59. New Orleans — New Orleans, La.
60. Baton Rouge — Baton Rouge, La.
61. Mississippi — Jackson, Miss.
88. Middle Tennessee — Nashville, Tenn.

REGION VIII — William J. Collins, Jr., Director
304-7 Oklahoma Natural Bldg.
Oklahoma City 2, Oklahoma

62. Arkansas — Little Rock, Ark.
63. Shreveport — Shreveport, La.
64. Houston — Houston, Tex.
65. Alamo — San Antonio, Tex.
66. Austin — Austin, Tex.
67. Dallas — Dallas, Tex.
68. Central Oklahoma — Oklahoma City, Okla.
69. Northeastern Oklahoma — Tulsa, Okla.
70. Fort Worth — Fort Worth, Tex.
71. West Texas — Lubbock, Tex.
91. East Texas — Tyler, Tex.

REGION IX — Fred Janssen, Director
P.O. Box 840
Denver 1, Colorado

72. El Paso — El Paso, Tex.
73. Rocky Mountain — Denver, Colo.
74. Utah — Salt Lake City, Utah
75. Nebraska — Omaha, Nebr.
76. Wichita — Wichita, Kan.
77. New Mexico — Albuquerque, N. M.
93. South Dakota — Sioux Falls, S. D.

REGION X — Thomas J. White, Director
American Standard Industrial Div.
4 West Fourth Ave.
San Mateo, California

78. Inland Empire — Spokane, Wash.
79. Puget Sound — Seattle, Wash.
80. Oregon — Portland, Ore.
81. Sacramento Valley — Sacramento, Calif.
82. Golden Gate — San Francisco, Calif.
83. San Joaquin — Fresno, Calif.
84. Southern California — Los Angeles, Calif.
85. San Diego — San Diego, Calif.
86. Central Arizona — Phoenix, Ariz.
87. Tucson — Tucson, Ariz.
92. British Columbia — Vancouver, B. C.
92. Southern Nevada — Las Vegas, Nev.

HONORS AND AWARDS

Upon recommendation of the Honors and Awards Committee and by vote of the Board of Directors, the Society presented four major awards at the 69th Annual Meeting in June 1962, at Miami Beach.

F. PAUL ANDERSON MEDAL

The F. Paul Anderson Medal, the highest honor offered by ASHRAE, was conferred upon Carlyle M. Ashley, Chief Staff Engineer with the Carrier Corporation, Syracuse, N. Y. Mr. Ashley, ASHRAE Presidential Member and Fellow, was cited for his important contributions in all phases of heating, refrigeration and air conditioning and for aiding in the advancement of this Society, his chosen profession, the industries with which his activities have been allied, and the public welfare.

ASHAE-HOMER ADDAMS AWARD

Albert C. Kent, student at Kansas State University, Manhattan, Kansas, received the 1962 ASHAE-Homer Addams Award. This \$600 award is sponsored by the Addams Memorial Fund to be given to a graduate student working on an ASHRAE research project. The Society's Research and Technical Committee selects the school which, in turn, recommends the student.

WILLIS H. CARRIER AWARD

The Willis H. Carrier Award was bestowed upon J. Richard Wright, ASHRAE Associate Member and Assistant Professor at the Tennessee School of Technology, in recognition of his co-authorship of the paper, "Calculated Temperature Rise in Round Ducts." This award, \$250 and a scroll, is sponsored by the Carrier Corporation for the best paper presented at a national meeting of the Society by an Associate Member under 30 years of age.

WOLVERINE-ASHRAE DIAMOND KEY AWARD

The annual Wolverine-ASHRAE Diamond Key Award was presented to Professor W. L. Bryan, ASHRAE Member, for his paper entitled "Heat and Mass Transfer in Dehumidifying Surface Coils." This paper appeared in the September, 1961, issue of the ASHRAE JOURNAL. Mr. Bryan is Associate Professor of Heat and Power, Mechanical Engineering Department, Case Institute of Technology, Cleveland, Ohio. The award, a gold key with a diamond insert, is sponsored by Calumet & Hecla, Inc.'s. Wolverine Tube Division for the best paper published in the ASHRAE JOURNAL, January through December of each year.



Carlyle M. Ashley, right, receives the F. Paul Anderson Medal, ASHRAE's highest honor, from 1961-62 President, John Everetts, Jr.

ASHRAE KLIXON AWARD

During the past year, there were no papers which complied with the terms of the Klixon Award and, therefore, this honor was not conferred. Consisting of \$150 and a certificate, the Klixon Award is sponsored by the Spencer Thermostat Division of Metals and Controls Corporation for the best paper published in the ASHRAE JOURNAL.

FELLOWS

In recognition of unusual distinction in the sciences of heating, refrigeration, air conditioning or ventilation, or allied sciences, a qualified member in good standing for ten years and over the age of 45 may be honored by elevation to Fellow.

Four members were so recognized at the 69th Annual Meeting in Miami Beach.

Everett K. Campbell . . . Member and Secretary of the ASHRAE Life Members Club. Chairman of the Board of the E. K. Campbell Co., heating equipment manufacturing firm in Kansas City, Mo. (Mr. Campbell died on November 24, 1962, at the age of 87.)

Harold P. Hayes . . . Dean of Engineering at the California State Polytechnic College, San Luis Obispo.

Clark M. Humphreys . . . Mechanical Engineer with the U.S. Public Health Service, Cincinnati, Ohio. Former ASHRAE Assistant Director of Research.

Lorin G. Miller . . . Partner, Miller Root Associates, Eaton Rapids, Michigan.

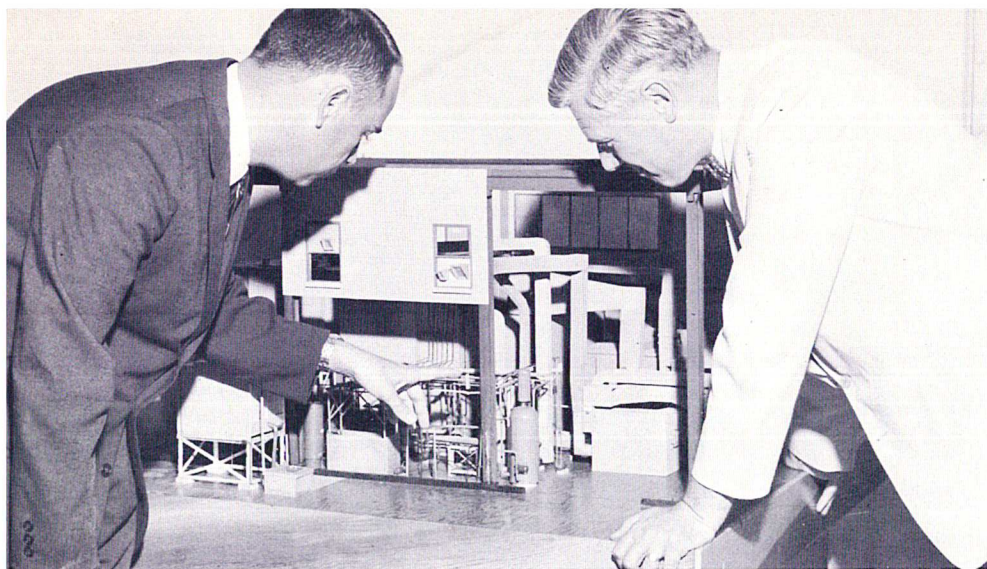
EDUCATION

Although ASHRAE does not offer educational scholarships on a national society basis, many of its chapters sponsor scholarships in their local areas and offer awards to promising students in selected curricula. The national Education Committee, in order to assist chapters in making scholarships available, has prepared a "Procedure and Guide," which is expected to increase the number of scholarships nation wide.

Currently, the Education Committee is making an analysis of the data collected from a survey in each chapter as to the extent of educational activity. Also,

started early in 1962 was a revision of "Opportunities in Engineering," a career-opportunity booklet which has been used widely by students, teachers and guidance counselors.

Refresher courses and technical seminars were conducted with varying degrees of success in many chapters. At the Semiannual Meeting in February 1961, the Board of Directors voted to cooperate actively with the Junior Engineering Technical Society (JETS) in making engineering information in our fields available to junior high and high school students.



Dr. Ralph G. Nevins, left, director of the Kansas State Institute for Environmental Research and head of KSU's Department of Mechanical Engineering, shows a visitor the design model of the Environmental Research test room located on the campus. The environmental chamber and associated equipment for controlling air temperature, humidity, room surface temperatures and other factors were transferred to KSU by ASHRAE.

RESEARCH PROGRAM

Significant progress has been made in the areas of research and research fund raising, the latter function assigned to a Research Fund Raising Sub-Committee now reporting to the Research and Technical Committee chairman. The staff Assistant Secretary in charge of Public Relations and Fund Raising is responsible, under the direction of the Sub-Committee, for the soliciting of general funds. Members of Technical Committees solicit for earmarked funds.

Funds for ASHRAE research are obtained in three ways: an allocated percentage of the membership dues; a contribution from the biennial International Heating and Air-Conditioning Exposition sponsored by the Society; and by contributions from individuals, companies and foundations.

For 1961-62, grants-in-aid to cooperative institutions for research projects totaled \$82,900. To this amount was added \$472.80 for insuring the Society's Environmental Room during transit and storage. A total of 34 research projects was considered; 16 were approved and implemented and are described in this report.

Within the limitations of budget and the resultant selectivity necessitated in choosing research and the institutions best suited to handle each project, the Society has a flourishing and stable research program . . . guided by a sound technical committee structure and a competent Manager of Research. The Research and Technical Committee has 69 technical committees and nine task groups.

The ASHRAE Research Program is naturally subdivided into three major types of projects. The first of these principal groups is that of "**Fundamental Studies**", which comprises the basic studies of environment on which our engineering developments are based. In general, these are interdisciplinary programs whose prosecution calls for expertness in such diverse fields as biophysics, meteorology and child psychology. A second broad area is that of "**Basic Engineering**"—the development of primary, essentially scientific, information about such processes as heat transfer, fluid flow, and systems reactions which are needed to permit a rational attack on the engineering problem of controlling the environment. Finally, there is a group of problems in "**Application Engineering**", in which the tools developed from the

basic engineering study are applied to specific problems in environmental control.

The Research Program for 1961-62 developed projects in each of these areas. As might be expected, the largest number of projects fell in the field of "**Basic Engineering**". On the other hand, the area of "**Fundamental Studies**" required the greatest expenditure of funds. It seems likely that this general pattern will continue to be followed in the years to come.

FUNDAMENTAL STUDIES

In its attack on problems of the reactions of human beings to their environment, the Society had developed a basic facility in its Cleveland Laboratory, the Environmental Chamber. At the beginning of this research year, this facility was disassembled because of the closing of the Laboratory. It was shipped to Kansas State University (KSU) in Manhattan, Kansas, and reassembly is now under way at the University's new Environmental Research Center. ASHRAE's program in the area of human comfort will resume at KSU in the summer of 1963.

Interim Physiological Research Program . . . Kansas State University \$4,800

When the plans for reestablishing the environmental chamber had been completed, it became evident that careful study would be required to assure proper use of this facility in carrying out the proposed program of research on human responses to the environment, which the Society planned to support at the rate of \$25,000 per year after the environmental chamber was placed in operation at its new home. Accordingly, Prof. Ralph G. Nevins of KSU proposed a program of interim studies which was accepted by the Society. This project undertook:

1. To collect and catalog reference material relating to comfort research;
2. To organize and design experiments in accordance with the ASHRAE Environmental Research; and
3. To make recommendations for future programs involving productivity and learning.

continued on page 10

INDUSTRY CONTRIBUTORS TO ASHRAE RESEARCH PROGRAM



Adams, Inc., Henry
Aerco Corporation
Alco Valve Company
Aluminum Company of America
American-Saint Gobain Corporation
Anderson Company, W. M.
Armstrong Cork Company, Incorporated
Armstrong Furnace Company
Austin Company, The
Auto-Flo Corporation
Avco Corporation, Lycoming Division

Barber-Colman Company
Barnebey-Cheney Company
Bell & Gossett Company
Bohn Aluminum and Brass Corporation
Breibert Company, The G. C.
Bridgers & Paxton Consulting Engineers, Inc.
Brown, Foskett
Buffalo Forge Company
Burgess-Manning Company
Burnham Corporation

Cambridge Filter Corporation
Carnes Corporation
Carrier Corporation
Chrysler Corporation, Airtemp Division
Clarage Fan Company

Detroit Stamping Company
Dow Chemical Company, The
du Pont de Nemours & Company, Inc., E. I.

Economides, Leander
Elliot & Company, Inc., Edwin
Egli and Gompf, Inc.

Farr Company
Feldman & Sons, Inc., Phil.
Forslund Pump and Machinery Corporation

G & O Manufacturing Company, The
General Motors Corporation, Frigidaire Division
Grant, Walter A.
Gritschke and Associates, Inc., E. R.
Gustin-Bacon Manufacturing Company

Hastings Air Conditioning Company, Inc.
Heating, Piping and Air-Conditioning Contractors—
Madison (Wisconsin) Association
Henry Valve Company
Hoffman Specialty Manufacturing Corporation
Hupp Corporation
Hydrotherm, Inc.

Ilg Electric Ventilating Company
Industrial Acoustics Company, Inc.
Insulation Board Institute

Jaros, Baum & Bolles Consulting Engineers
Jenkins Brothers
Jenn Air Products Company, Inc.
Johns-Manville Corporation
Johnson Service Company

Kahn Associates Architects and
Engineers Foundation, Albert

Lau Blower Company, The
Leslie Foundation
Libbey-Owens-Ford Glass Company

Magnetrol, Inc.
Marley Company, The
McCord Corporation
McQuay Inc.
Mechanical Contractors Association of
Philadelphia, Inc.
Midland-Ross Corporation, Janitrol Heating &
Air-Conditioning Division
Minneapolis-Honeywell Regulator Company
Mississippi Glass Company
Modine Manufacturing Company
Monsanto Chemical Company
Morrison Supply Company
Morrison, W. Bruce

Nash Engineering Company, The

Orr-Schelen, Inc.
Owens-Corning Fiberglas Corporation

Paragon Electric Company
Patterson and Associates, Inc., V. C.
Penn Controls, Inc.
Philadelphia Electric Company
Pittsburgh Corning Corporation
Pittsburgh Plate Glass Company
Powers Regulator Company, The
Pyle-National Company, The

Raisler Corporation
Ranco, Inc.
Revcor
Reznor Manufacturing Company
Roberts-Gordon Appliance Corporation
Robertshaw-Fulton Controls Company,
Fulton Sylphon Division
Robertson Co., H. H.

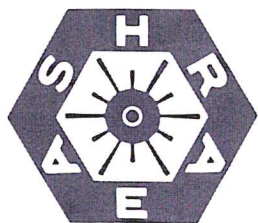
Schemenauer Manufacturing Corporation
Scoville Manufacturing Company
Smith Company, Inc., The H. B.
Spence Regulators
Sporlan Valve Company
Stinard, Rutherford L.

Technical Filter Company
Texas Instruments, Inc., Metals and Controls Division
Torrington Manufacturing Company, The
Trane Company, The

United Sheet Metal Company, Inc.

Vapor Heating Corporation
Voorhees Walker Smith Smith & Haines Architects

Weil-McLain Company, Inc.
Weiss & Company, Carl
Welbilt Corporation
Westinghouse Electric Corporation
Whirlpool Corporation
White-Rodgers Company
Whitman, Requaardt & Associates
Whittlesey and Associates
Wiremold Company, The
Wolff & Munier, Inc.



RESEARCH continued

More than a thousand references dealing with comfort, physiological response of human subjects, health, and environmental instrumentation have been cataloged and organized. Also, a study was begun of the data taken at Cleveland dealing with uniform thermal radiation effects.

Climate Control in an Educational Program . . . Florida State University and Pinellas County (Florida) Board of Public Education . . . \$8,270

In the fall of 1961, ASHRAE's Technical Committee 1.4 on Physiology and Human Environment became interested in a study under way in Pinellas County, Florida, to analyze the educational outcomes and operating costs of two new junior high schools in the neighboring communities of Clearwater and Pinellas Park—one air conditioned, the other not. This project was partly financed by a grant from the Office of Education, U.S. Department of Health, Education and Welfare.

Subsequently, ASHRAE entered into agreements with the Pinellas County Board of Public Instruction and Florida State University to provide a research grant to analyze the data taken and to extend the program through the 1962 summer session. ASHRAE is also granting financial support to cover the 1962-63 academic year.

To enhance the value of the data, the Society provided for the services of consultants in the fields of engineering and educational research. A preliminary analysis of the first academic year's work was started.

In addition a thoroughly documented "Report on Areas, Volumes and Unit Costs of Construction in Pinellas County, Florida", by Fred Stuart of the Pinellas County Board of Public Instruction, and Dr. Hazen A. Curtis of Florida State University, was published in the June 1962 issue of the ASHRAE Journal.

State of the Art of Design of Survival Shelters for Habitability . . . New York University . . . \$10,000

At the Semiannual Meeting in St. Louis in January 1962, the Task Group on Survival Shelters urgently recommended preparation by the Society for a Symposium on Environmental Conditions in Survival Shelters to be held at the Miami Meeting, in June of the same year. Part of the preparation for this Symposium was a crash program placed with New York University of a collection and review of the available literature on this subject. At the Miami Meeting, "A Selective Bibliography on Environmental Control and Habitability of Survival Shelters" was presented at the Symposium and distributed to those interested. This Bibliography covered about 200 items culled from a much larger number. Plans have been made to bring it up to date at the end of the year 1962-63.

Design Temperatures Correlation . . . Loren W. Crow, Meteorologist, Denver, Colorado . . . \$6,450

The fundamental background against which the engineering members of the Society must work includes the environment established by the weather, as well as the physiology of the human beings and animals which our equipment serves. To improve our knowledge of this subject, which is made available to the Society through the extended tabulations in the ASHRAE Guide and Data Book, the Society engaged Loren W. Crow, a Consulting Meteorologist of Denver, Colorado, to re-examine currently available data in the development of improved winter-weather and summer-weather design conditions. The project makes use of electrical data processing of the records available at the National Weather Record Center in Asheville, N. C. This project was started Feb. 1, 1962 and results are to be reported by January 31, 1963.

Ventilation Requirements . . . Northwestern University . . . \$2,900

A study of ventilation requirements was placed with Northwestern University too late in the school year to permit staffing. Therefore, prosecution was delayed until the following academic year, 1962-63.

BASIC ENGINEERING

Condensing Refrigerants in Horizontal and In- clined Tubes . . . Kansas State University, \$3,600

This basic study of heat transfer has been supported in part by the Society and its predecessors at Kansas State University since 1953. A number of papers and academic theses have been generated during this period of time. The current program makes use of an ingenious thermal flow meter to attempt to develop local coefficients which could be used in a basic correlation of heat transfer conditions. In addition, a photographic study of 2-phase flow patterns was undertaken to assist qualitatively in the study of Condensing Flow in a Horizontal Tube. A semi-theoretical equation for the heat transfer coefficient which correlates the experimental data within a maximum deviation of 11% was reported in a thesis entitled "Condensing Heat Transfer in a Horizontal Tube", by Ching-Jen Chen, dated May 15, 1962.

Heat Transfer from Air-Conditioning Ducts . . . Kansas State University . . . \$1,800

This study at Kansas State University will, it is hoped, improve the capacity to estimate transmission losses in heating and air-conditioning systems, as well as advance knowledge of natural convection processes. A standard 10" diameter duct is supplied with heated air at varying velocities. The losses have been observed both when the duct is in an unobstructed space and when it is mounted between joists with flooring above.

**Heat and Mass Transfer in Dehumidifying Coils
... Case Institute of Technology \$4,500**

When cooling is combined with dehumidification, as it is in many air conditioning processes, the two phenomena interact so that the coefficients differ from those observed when a mass transfer step is not involved. A study of this complex process has been supported at Case Institute of Technology since 1958. Some of the prior work was reported in a paper by Professor W. L. Bryan in the April 1962 issue of the ASHRAE Journal. Work during 1961-62 was aimed at determining the effect of each row of a multiple-row extended-surface heat exchanger and the effect of changes in refrigerant temperature, with the resulting changes in air and vapor properties.

**Analog Study of Heating in Survival Shelters . . .
Prof. E. E. Drucker of Syracuse Univ. . . \$3,375**

Professor Drucker's investigations contributed importantly to the Symposium on Environmental Conditions in Survival Shelters held at the Miami Meeting, and reported on above. It represents an application of the advanced technique of analog computation to the problem of heat flow to and from a confined living space. Examined were the environments that would exist in underground shelters in six geographic areas throughout the United States. Findings revealed that the environment in shelters in three principal cities would be intolerable most of the time unless some form of air conditioning was installed.

Steam and Condensate Flow in Pipes . . . University of Illinois \$7,000

One of the Fluid Flow Projects now being carried on at the University of Illinois is the study of the 2-phase flow of steam and condensate in the same pipe, as it exists, for instance, in many heating systems. This project was originally planned at the Cleveland Laboratory but was transferred to the University of Illinois when the Cleveland Laboratory was closed. The first series of tests on 1" nominal pipe-size copper tubing with a slope of $\frac{1}{2}$ " per 10 ft. indicated that the pressure drop for a given steam flow was slightly above that obtained for flow in similar pipe without returning condensate. Subsequently, the piping was changed to a new slope of 2" per 100 ft., aligned with the use of a surveyor's transit. Additional glass pipe sections were installed to provide better observation of the flow pattern and scheduled tests were again under way at the end of the research year.

Low-Speed Wind Tunnel Study on Vent Gas Distribution . . . New York University \$4,950

Some time ago the National Institutes of Health engaged the services of New York University's Low-Speed Wind Tunnel Group to determine where to place vent gas releases on the new building of the Institutes so as to avoid contaminating the ventilating air supplied to the

building. In developing their technique, the wind tunnel scientists made extensive tests with a simple block building. The results of these tests were used in interpreting the results of the tests on the complex building under investigation, but the data were never completely coordinated and published. ASHRAE took advantage of this situation to have the existing data collected and organized at a cost far below that required to do the experimental work. It is anticipated that the publication of these results, expected during the year 1962-63, will make available to designers basic information on the spread of contamination from release points on simple building blocks.

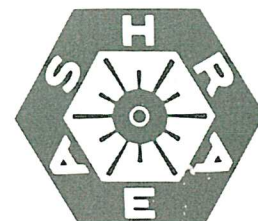
Air-Conditioning System Control . . . University of Wisconsin \$11,305

A relatively new development in engineering techniques is the application of feed back control theory to the synthesis of control systems. This technique and its related methods of analysis arose from World War II developments in gun laying and missile control. Application of these techniques to the control of air-conditioning systems necessitates determining the dynamic response characteristics of the various components that enter into air conditioning systems.

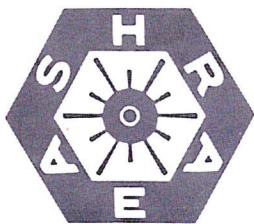
Accordingly, the Society's Task Group on Air-Conditioning System Control secured the cooperation of the University of Wisconsin in setting up a first project in this area. This particular project has taken as its objective the establishment of techniques for predicting transfer functions for typical heat exchangers from the physical characteristics of the exchanger. By the end of the year the test loops for the experimental side of the work were nearly 60% completed and all major instrumentation had been either received, promised or was on order. It is anticipated that the year 1962-63 will see the development of the first experimental results and their coordination with analytical predictions.

Thermoelectric Instrument for Heat and Mass Transfer Study . . . Case Institute of Technology, \$1,000

In the course of Professor Bryan's work on Heat and Mass Transfer in Dehumidifying Coils, described above, it became evident that heat balance methods of determining the heat flow through surfaces involved in heat and mass transfer are difficult and tend to be inaccurate when temperature changes are small. These difficulties led to the suggestion that the principles of thermoelectricity might be used to permit direct measurement of



continued on page 12



RESEARCH

continued

the heat flux through such surfaces. A small grant has permitted the Case Institute of Technology to fabricate a pilot instrument and calibration apparatus for checking its performance. The calibration of the equipment will be the subject of graduate student research during 1962-63.

APPLICATION ENGINEERING

Balancing Air Distribution Systems; Air Measuring Devices . . . University of Illinois, \$5,000

In practically all large air conditioning installations considerable time is expended in balancing the system and assuring its design operation, even after all of the equipment has been installed and checked out. One of the problems that produces this difficulty is the variability in the indications of air measuring devices under the relatively uncontrolled conditions of use in air-conditioned spaces. To overcome this difficulty, ASHRAE's Technical Committee 4.1 on Duct Design and Room Air Distribution is sponsoring this project at the University of Illinois. The objectives of the study are to determine the operating range and accuracy of various instruments for measuring air flow through supply outlets and return intakes, and to establish a basis for standardized techniques for such measurements. This project was not initiated until the spring of 1962 but by the end of June the necessary wind tunnels and calibration tubes had been set up and initial calibration work was begun.

Safety of High-Temperature Water Systems . . . University of Illinois . . . \$5,000

While high temperature water systems have been extensively used for the heating of extended government installations, such as Air Force Bases, the application of this method to commercial installations has been hampered by the stringency of safety codes originally designed for high pressure boilers, which are applied to such systems for the lack of applicable information on their safety. To meet this situation, ASHRAE's Technical Committee 3.1 on Hot Water and Steam Heating developed a cooperative program with the University of Illinois, which started in the spring of 1962. By June, laboratory equipment was nearly completed to determine the discharge rates and the areas in which there would be a hazard from burning or explosions from perforations in pipes carrying water at 150 psi and 350F, compared with those carrying saturated steam at the same pressure, and water at the same pressure but at room temperature.

Solar Heat Gain through Insulating Glass with Inside Shading . . . University of Florida, \$2,950

This project represents the continuation of the program which had been carried on for several years at the ASHRAE Laboratory. The transfer of the solar calorimeter to the University of Florida was accomplished during the first part of 1961-62 and its calibration was completed early in January 1962. With the installation completed to the satisfaction of the Technical Committee 2.5 on Fenestration, this Committee outlined the logical extension of work previously performed to the measurement of heat gains through insulating glass with inside shading. Previous work at the Laboratory had established the characteristics of inside shading using non-insulating glasses, and had also established the characteristics of insulating glass without shading. Work on this project was started at the end of the fiscal year and is expected to be completed during 1962-63.

PUBLIC RELATIONS, ADVERTISING AND SALES PROMOTION

The ASHRAE public relations program continued to expand and public relations skills were employed effectively in producing Society advertising and sales promotion pieces, and booklets and material for the Membership Development campaign. The advertising agency, which ASHRAE had used for the past two years, was dropped and a public relations agency was engaged. Working closely with the new Advertising Manager and the Assistant Secretary—Public Relations and Fund Raising, the agency has contributed measurably to enhancing our over-all advertising and sales promotion programs, as well as advising regarding public relations.

The Public Relations Department began publication of ASHRAE INTELLIGENCE which is designed to pro-

vide additional news information of national interest for current chapter publications and to encourage those chapters without house organs to publish them. This bulletin will shortly be distributed on a regular basis.

Another public relations achievement is the publication of this annual report. Although a digest of the Society's fiscal-year activities has traditionally been carried in the ASHRAE JOURNAL, this year marks the first publication of our official annual report.

ASHRAE public relations assistance was called upon in preparation for the dedication of the United Engineering Center in November 1961, in which former President Herbert Hoover, Honorary Member of ASHRAE, participated.

ORGANIZATION

OFFICERS

John H. Fox President		
Frank H. Faust First Vice President	John E. Dube Second Vice President	
James W. May Treasurer	R. C. Cross Executive Secretary	M. C. Turpin Executive Secretary Emeritus

BOARD OF DIRECTORS

Past President John Everetts, Jr.		June 1961-June 1963 P. R. Achenbach
June 1961-June 1964	June 1962-June 1963	June 1962-June 1965
N. B. Hutcheon	W. L. McGrath	Lincoln Bouillon
W. B. Morrison	G. H. Meffert	H. G. Gragg
P. W. Wyckoff	Burt Lomax, Jr. (VII)	L. R. St. Onge
P. K. Barker (I)	W. J. Collins, Jr. (VIII)	A. C. Gowdy (IV)
J. H. Ross (II)	Fred Janssen (IX)	William Taylor (V)
E. K. Wagner (III)	T. J. White (X)	Axel Marin (VI)

Note: Roman numerals indicate the region to which each director is assigned as **Regional Director**.

HEADQUARTERS STAFF

Executive Secretary R. C. Cross	Assistant Secretary—Membership A. G. Feltus	Circulation Manager George Gray
Associate Secretary A. T. Boggs, III	Assistant Secretary—Public Relations and Fund Raising J. H. Cansdale	Advertising Sales Manager W. E. Boeddener
Technical Secretary H. P. Tinning	Assistant Secretary—Meetings Julia I. Szabo	Editor—Guide and Data Book C. W. MacPhee
Manager of Research M. A. Mayers	Assistant to Treasurer Martha Flaherty	Editor—Journal R. J. Anthony

ADMINISTRATION

The Board of Directors and the Long Range Planning Committee have given a long-hard look at the structure of the Society from the standpoint of officer and board organization, as well as headquarters staff and general committees. At the Semi-annual Meeting in February 1963, the membership will vote on a proposed reorganization of the officer and board formation and whether or not three committees—Divisional Advisory, General and Administrative Coordinating, and Technical Coordinating—should be continued or dropped.

Services to members were greatly improved by incorporating all membership records on IBM cards, this

service provided by the Data Processing Center, located in the United Engineering Center. Heretofore, pertinent membership, statistical, financial and ABC (Audit Bureau Circulations) information was maintained on separate cards reposing in the files of separate headquarters departments. Currently, all information is available on one card maintained in a central Membership Department file. Copies of these cards are also made available to chapters each month, simplifying their record keeping. This new procedure has substantially minimized delays in changes of address and mailing of publications.

ASHRAE FINANCIAL STATEMENTS

To The Board of Directors and Membership
American Society of Heating, Refrigerating
and Air-Conditioning Engineers, Inc.

In accordance with the authority contained in the minutes of the meeting of the Board of Directors on June 29, 1961, we have examined the Consolidated Statement of Financial Condition of the AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS, INC., NEW YORK at June 30, 1962 and the consolidated results of its operations for the year then ended. Our examination was conducted in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the accompanying Consolidated Statements of Financial Condition, of Income and Expense, and of Changes In Fund Balances of the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., present fairly its financial condition at June 30, 1962 and the results of its operations for the year then ended. These statements were prepared in accordance with generally accepted accounting principles and with the directives of the Board of Directors applied on a basis consistent with that of the preceding year.

Frank H. Tusa & Co.

Certified Public Accountants
Dated September 20, 1962

CONSOLIDATED STATEMENT OF FINANCIAL CONDITION — June 30, 1962

ASSETS

CURRENT

Cash on Hand and On Deposit	\$197,241.72	
Accounts Receivable		
Net of Allowance of \$1,134.25 for Agency Commissions	\$153,102.74	
Deposits	2,221.00	
Accrued Interest	1,473.95	156,797.69
Inventories—At Lower of Cost or Market		29,888.75
Prepaid Insurance and Dues		1,244.22
Total Current Assets		\$385,172.38

INVESTMENTS IN SECURITIES—AT COST

(Market Value \$407,352.00)	419,866.12
-----------------------------------	------------

LAND AND BUILDING (CLEVELAND, OHIO)

Net of Allowance of \$3,908.07 for Depreciation	90,207.75
---	-----------

FURNITURE, FIXTURES AND EQUIPMENT

(New York, New York)	1.00
----------------------------	------

DEFERRED EXPENSES	23,344.67
	<u>\$918,591.92</u>

LIABILITIES AND FUND BALANCE

CURRENT LIABILITIES

Accounts Payable	\$184,863.59	
Prepaid Dues and Admissions		
Candidates	\$4,417.18	
Elected Members	6,769.95	11,187.13
Deferred Income		447.08
Federal Excise Tax Payable		12.15
Total Current Liabilities		\$196,509.95

CONSOLIDATED FUND BALANCE	722,081.97
	<u>\$918,591.92</u>

CONSOLIDATED STATEMENT OF INCOME AND FUND BALANCE

For the fiscal year ended June 30, 1962

OPERATING INCOME		
Membership Dues		\$434,650.23
Admission Fees		13,422.50
PUBLICATIONS		
Advertising—Gross	\$395,392.87	
Less: Agency Commissions and Discounts	61,695.85	\$333,697.02
Copy Sales		89,360.54
Subscriptions and Other	15,198.70	438,256.26
Contractual Projects		3,500.26
General and Earmarked Contributions		27,540.00
Emblem Sales		1,260.25
TOTAL OPERATING INCOME		\$918,629.50
OPERATING EXPENSES		
All Salaries		275,500.63
Prime Cost of Publications	311,630.25	
Publications Commissions, Promotion, Other	52,659.49	364,289.74
Directors and Committees Travel		30,147.65
Chapter and Host Chapter Allowances and Supplies		37,104.57
Annual and Semi-Annual Meetings		14,373.31
Dues		9,370.00
Certificates, Emblems, Medals and Awards		3,425.99
Group Life Insurance and Pension Administration Fee		1,696.31
Payroll Taxes		7,140.19
Building Operation		3,037.60
Cooperative Research Projects		83,372.80
Rent and Electric		24,631.43
Printing, Stationery and Office Supplies		13,514.39
Other Administrative Expenses		92,861.15
TOTAL OPERATING EXPENSES		960,465.76
EXCESS OF OPERATING EXPENSES OVER OPERATING INCOME		\$ 41,836.26
OTHER INCOME		
Interest Earned on Deposits and Investments	\$14,604.06	
Dividends Earned on Investments	8,506.91	
Capital Gains on Sale of Securities	17,421.35	
Sundry Income	1,537.90	42,070.22
OTHER DEDUCTIONS		
Awards	965.00	
Foreign Exchange Fluctuation	582.34	
Investment Advisory Fee	2,152.98	
Non-Recurring Expenses	44,414.85	48,115.17
EXCESS OF OTHER DEDUCTIONS OVER OTHER INCOME		6,044.95
CONSOLIDATED NET EXCESS OF EXPENSES OVER INCOME		(47,881.21)
CONSOLIDATED FUND BALANCE—JULY 1, 1961		772,957.78
EXCESS OF PENSION FUND DISTRIBUTIONS OVER PENSION FUND CONTRIBUTIONS		2,994.60
CONSOLIDATED FUND BALANCE—AS ADJUSTED		769,963.18
CONSOLIDATED FUND BALANCE—JUNE 30, 1962		\$722,081.97

“The object of the Society is to advance the arts
and sciences of Heating, Refrigeration, Air Conditioning,
and Ventilation, and the allied arts and sciences,
for the benefit of the general public.”



AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS, INC.

UNITED ENGINEERING CENTER • 345 E. 47th ST. • N. Y. 17, N. Y.

