



SUGAR INDUSTRY TECHNOLOGISTS INC.

VOLUME XLIX

Publication of Technical Papers and Proceedings

of the

FORTY-NINTH ANNUAL MEETING

of

SUGAR INDUSTRY TECHNOLOGISTS, INC.

VANCOUVER, B.C. CANADA

MAY 6-9, 1990

Published by

SUGAR INDUSTRY TECHNOLOGISTS, INC.

New York

Mailing Address

P.O.Box 632

Ste-Therese de Blainville, Quebec, Canada J7E 4K3



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PURPOSE OF SUGAR INDUSTRY TECHNOLOGISTS, INC.

Sugar Industry Technologists, Inc. was established in 1941 to serve the professional interests of its members by providing a forum for the exchange of scientific information and other technical aspects of sugar refining, by encouraging original research in sugar technology, by promoting a broader acquaintance among its members, and by cooperating with other engineering, technical and scientific societies.

Past Meeting Sites

1941 - 1967, New York
1968 - Montreal
1969 - New York
1970 - New Orleans
1971 - New York
1972 - Houston
1973 - Miami
1974 - Vancouver
1975 - Savannah
1976 - Toronto
1977 - San Francisco
1978 - London, England
1979 - Boston
1980 - Chicago
1981 - Fort Lauderdale
1982 - Atlanta

1983 - New York
1984 - Houston
1985 - Saint John, N.B.
1986 - Baltimore
1987 - Sydney, Australia
1988 - Savannah
1989 - New Orleans
1990 - Vancouver

Approved Future Meeting Sites

1991 - New York
1992 - Brussels, Belgium
1993 - Toronto, Ont.
1994 - Hawaii
1995 - Dominican Republic

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FORWARD

The 49th Annual Meeting and Technical Conference were held in Vancouver, the pearl of super, natural British Columbia, Canada.

The staff of B.C. Sugar did an outstanding job. The Local Arrangements Committee led by Don and Joyce Webster has to be commended for the excellent organization which made our stay in Vancouver a memorable one.

Program Chairman Frank Stowe assembled a total of 14 interesting papers. Joe Alberino presided as Chairman of Symposium Cane Sugar Refining - Methods of Purification. Congratulations to the authors and their companies for the excellent quality of the presentations.

Bruce Foster, our Executive Director and his secretary, Diana Dixon were quite instrumental in having the meetings and functions running smoothly.

We welcome C. Frank Stowe, our Past President who will serve again on the Committee and a new member to the Executive Committee, Jean de Chazal of Colonial Sugar who will replace Conrad Ourso.

Finally, we extend our sincere thanks to our host company, B.C. Sugar, who invited us to help celebrate the Company's One Hundredth Anniversary. They were gracious hosts and more particularly the local colour evening will be a landmark for all the attendees!

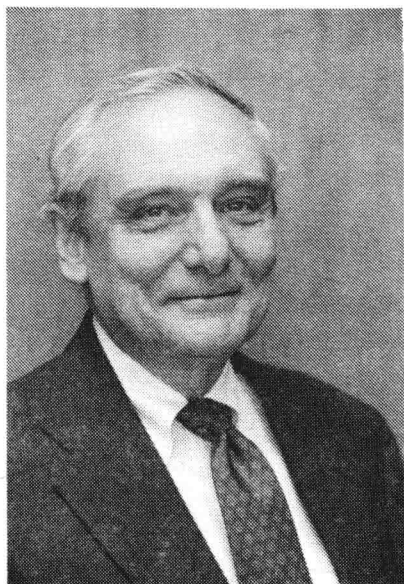
We will look forward to welcoming you at our next meeting in New York which will be co-hosted by Amstar Sugar Corporation and Refined Sugars, Inc.

It will be the Fiftieth Anniversary of S.I.T. !

CHRISTIAN LAUR
PRESIDENT- ELECT



CHRISTIAN LAUR
President-Elect



JOSEPH W. ALBERINO
1st Vice President-Elect



THOMAS F. CHANDLER
2nd Vice President-Elect

SUGAR INDUSTRY TECHNOLOGISTS, INC.

1989 - 1990

Who have served during the past year

OFFICERS

President	Léon Sué	Raffinerie Tirlemontoise S.A.
1st Vice President	Christian Laur	Tate & Lyle France
2nd Vice President	Joseph W. Alberino	Savannah Sugar Refinery
Vice President - Finance	Donald H. Griffin, Jr.	Refined Sugars, Incorporated
Immediate Past President	C. Frank Stowe	Amstar Sugar Corporation
Executive Director	Bruce A. Foster	S.I.T.

EXECUTIVE COMMITTEE

J. Colin Abram	Tate & Lyle
Leon A. Anhauser	Imperial Holly Sugar Co.
Pablo Carreno	Okeelanta Corporation
Thomas F. Chandler	Redpath Sugars, Limited
David M. Humm	C & H Sugar Company
Conrad J. Ourso	Colonial Sugars, Incorporated
Mario de Campos Vidal	Sidul - Sociedade Industrial Do Ultramar
Donald E. Webster	B.C. Sugar Company

COMMITTEE CHAIRMEN

By-Laws	Joseph W. Alberino	Savannah Sugar Refinery
Finance	Donald H. Griffin, Jr.	Refined Sugars, Incorporated
Crystal Award	Chung Chi Chou	Amstar Sugar Corporation
	R.A. McGinnis	Beet Sugar Institute
Meade Award	Christian Laur	Tate & Lyle France
Planning & Program	C. Frank Stowe	Amstar Sugar Corporation
Nominating	David M. Humm	C & H Sugar Company
Publication	Bruce A. Foster	S.I.T.
Membership	C. Richard Brown	Lantic Sugar Limited
Symposium	Joseph W. Alberino	Savannah Sugar Refinery
Registration	George C. Conrad	Western States Machine Co.

LOCAL ARRANGEMENTS

1990 - Vancouver	Donald E. Webster	B.C. Sugar Limited
1991 - New York	Donald H. Griffin	Refined Sugars, Incorporated

SUGAR INDUSTRY TECHNOLOGISTS, INC.

1990 - 1991

Elected to serve during the coming year

OFFICERS

<i>President</i>	<i>Christian Laur</i>	<i>Tate & Lyle France</i>
<i>1st Vice President</i>	<i>Joseph W. Alberino</i>	<i>Savannah Sugar Refinery</i>
<i>2nd Vice President</i>	<i>Thomas F. Chandler</i>	<i>Redpath Sugars, Limited</i>
<i>Vice President - Finance</i>	<i>Donald H. Griffin, Jr.</i>	<i>Refined Sugars, Incorporated</i>
<i>Immediate Past President</i>	<i>Léon Sué</i>	<i>Raffinerie Tirlemontoise S.A.</i>
<i>Executive Director</i>	<i>Bruce A. Foster</i>	<i>S.I.T.</i>

EXECUTIVE COMMITTEE

<i>J. Colin Abram</i>	<i>Tate & Lyle</i>
<i>Leon A. Anhauser</i>	<i>Imperial Holly Sugar</i>
<i>Pablo Carreno</i>	<i>Okeelanta Corporation</i>
<i>Jean L. de Chazal</i>	<i>Colonial Sugars Inc.</i>
<i>David M. Humm</i>	<i>C & H Sugar Company</i>
<i>C. Frank Stowe</i>	<i>Amstar Sugar Corporation</i>
<i>Mario de Campos Vidal</i>	<i>Alcantara Refinarias Acurares</i>
<i>Donald E. Webster</i>	<i>B.C. Sugar, Limited</i>

COMMITTEE CHAIRMEN

<i>By-Laws</i>	<i>Joseph W. Alberino</i>	<i>Savannah Sugar Refinery</i>
<i>Finance</i>	<i>Donald H. Griffin, Jr.</i>	<i>Refined Sugars, Incorporated</i>
<i>Crystal Award</i>	<i>Joseph A. Harrison, Sr.</i>	<i>Supreme Sugar Company, Inc.</i>
	<i>Earl J. Roberts</i>	<i>Sugar Processing Research, Inc.</i>
<i>Meade Award</i>	<i>J.W. Alberino</i>	<i>Savannah Sugar Refinery</i>
<i>Nominating</i>	<i>David M. Humm</i>	<i>C & H Sugar Company</i>
<i>Membership</i>	<i>C. Richard Brown</i>	<i>Lantic Sugar Limited</i>
<i>Symposium</i>	<i>Christian Laur</i>	<i>Tate & Lyle France</i>
<i>Registration</i>	<i>George C. Conrad</i>	<i>Western States Machine Co.</i>

LOCAL ARRANGEMENTS

<i>1991 - New York</i>	<i>Donald H. Griffin Jr.</i>	<i>Refined Sugars, Incorporated</i>
<i>1992 - Brussels, Belgium</i>	<i>Léon Sué</i>	<i>Raffinerie Tirlemontoise S.A.</i>

SUGAR INDUSTRY TECHNOLOGISTS, INC.

DIRECTORS

1990 - 1991

Alcantara Refinarias-Acucares,S.A.
Mario de Campos Vidal

Amstar Sugar Corporation
C. Frank Stowe

B.C. Sugar Limited
Donald E. Webster

Beghin-Say
Edouard Ricard

California & Hawaiian Sugar Co.
David M. Humm

Central El Palmar S.A.
Fernando Cordovez Z

Colonial Sugars, Inc.
Jean L. de Chazal

CSR Limited - Sugar Division
Peter Bowen

Fiesta Sweeteners Corporation
Carlos L. Barnes

Finnish Sugar Company, Ltd.
Leif Ramm-Schmidt

Generale Sucriere
Philippe Dauvois

Hulett Refineries
Richard A. Crooks

Imperial Holly Sugar Company
Leon A. Anhauser

Lantic Sugar Limited
John Wheatley

Millaquin Sugar Company
Ronald J. Swindells

Okeelanta Corporation
Pablo Carreno

Pfeifer u. Langen
Helmut Eichhorn

Raffinerie Tirlemontoise S.A.
Leon Sue

Rar-Rafinarias De Acucar Reunidas
Luis Rocha San Miguel Bento

Redpath Sugars Limited
Thomas F. Chandler

Refinaria Cruzeiro Amorim Primo S.A.
Jose Aurelio Silvestre Bezerra

Refined Sugars, Inc.
Donald H. Griffin, Jr.

Savannah Sugar Refinery
Joseph W. Alberino

Supreme Sugar Company, Inc
Joseph A. Harrison, Sr.

Tate & Lyle Sugars
J. Colin Abram

Victoria Milling Company, Inc.
Claudio R. de Luzuriaga Jr.

PAST PRESIDENTS
of
SUGAR INDUSTRY TECHNOLOGISTS, INC.

1941	ROBERT S. KENT* <i>Robert Sayre Kent, Inc.</i>	1963	FREDERICK BRUDER <i>SuCrest Corporation</i>
1942	ROBERT S. KENT* <i>Robert Sayre Kent, Inc.</i>	1964	WATSON A. BEMIS <i>Revere Sugar Refinery</i>
1943	R.A. RING <i>Atlantic Sugar Refineries Co., Ltd.</i>	1965	FREDERICK W. SCHWER <i>National Sugar Refining Company</i>
1944	ALEX M. ORMOND <i>Savannah Sugar Refining Corporation</i>	1966	E.D. GILLETTE <i>Refined Syrups & Sugars, Inc.</i>
1945	FRED M. GIBSON <i>American Sugar Refining Company</i>	1967	RUFUS J. HERRING <i>Savannah Sugar Refining Corporation</i>
1946	FRANK C. STAPLES <i>American Molasses Company</i>	1968	H. JAMES REICHE <i>Refined Syrups & Sugars, Inc.</i>
1947	FRANK C. STAPLES <i>American Molasses Company</i>	1969	HENRY G. GERSTNER <i>Colonial Sugars Company</i>
1948	FRANK C. STAPLES <i>American Molasses Company</i>	1970	DORR E. TIPPENS <i>Amstar Corporation</i>
1949	FRANK M. EXLEY <i>Savannah Sugar Refining Company</i>	1971	PHILIP F. MEADS <i>California & Hawaiian Sugar Co., Inc.</i>
1950	CURTIS L. TAGGART <i>Revere Sugar Refinery</i>	1972	JOSEPH A. METZLER <i>Godchaux-Henderson Sugar Co., Inc.</i>
1951	ANSON J. FOWLER <i>National Sugar Refining Company</i>	1973	WARREN L. REED <i>Revere Sugar Refinery</i>
1952	JAMES M. BROWN <i>Revere Sugar Refinery</i>	1974	STEPHEN STACHENKO <i>Redpath Sugars Limited</i>
1953	JAMES M. BROWN <i>Revere Sugar Refinery</i>	1975	GEORGE FAWCETT <i>Savannah Sugar Refinery</i>
1954	FRANK M. CHAPMAN <i>Tate & Lyle Refineries, Ltd.</i>	1976	A.M. BARTOLO <i>Imperial Sugar Company</i>
1955	PETER H. PETRI <i>American Molasses Company</i>	1977	K.R. HANSON <i>Amstar Corp. American Sugar Div.</i>
1956	GEOFFREY CONSTABLE <i>St. Lawrence Sugar Refineries, Ltd.</i>	1978	STANLEY E. GEORGE <i>B.C. Sugar</i>
1957	FRANK A. MONROE, JR. <i>Revere Sugar Refinery</i>	1979	R. STUART PATTERSON <i>California & Hawaiian Sugar Co.</i>
1958	W. AUSTIN CLARNO <i>Savannah Sugar Refining Company</i>	1980	JOHN V. LOPEZ-ONA <i>National Sugar Refining Company</i>
1959	ELMER J. CULP <i>American Sugar Refining Company</i>	1981	JOSEPH A. HARRISON, SR. <i>Supreme Sugar Company, Inc.</i>
1960	G. ERNEST WARING <i>Atlantic Sugar Refining Co., Ltd.</i>	1982	MICHAEL C. BENNETT <i>Tate & Lyle, Ltd.</i>
1961	A.D. HINRICHS <i>Refined Syrups & Sugars, Inc.</i>	1983	BRUCE A. FOSTER <i>St. Lawrence Sugar, Ltd.</i>
1962	H.J. JACOBS <i>South Coast Corporation</i>	1984	LOUIS E. MAHONEY III <i>Revere Sugar Corporation</i>

*Chairman of Executive Committee

PAST PRESIDENTS
of
SUGAR INDUSTRY TECHNOLOGISTS, INC.

- | | |
|-------------|--|
| 1985 | EDWARD D. STEPHENSON
<i>Lantic Sugar Limited</i> |
| 1986 | DAVID M. HUMM
<i>California & Hawaiian Sugar Co.</i> |
| 1987 | LEON A. ANHAISER
<i>Imperial Holly Sugar Company</i> |
| 1988 | C. FRANK STOWE
<i>Amstar Sugar Corporation</i> |
| 1989 | LEON SUE
<i>Raffinerie Tirlemontoise S.A.</i> |

RECIPIENTS OF THE S.I.T. CRYSTAL AWARD**

(S.I.T. Achievement Award in Sugar Technology)

1961	DR. VICTOR DIETZ <i>National Bureau of Standards</i>	1972	THOMAS R. GILLETT* <i>California & Hawaiian Sugar Co.</i>
1961	LOHN LOWE* <i>Revere Sugar Refinery</i>	1973	WILLIAM W. BLANKENBACH <i>B.C. Sugar Refining Co. Ltd.</i>
1962	HAROLD E.C. POWERS <i>Tate & Lyle Refineries, Ltd.</i>	1974	W. AUSTIN CLARNO <i>Savannah Sugar Refinery</i>
1962	EUGENE C. GILLETT* <i>C & H Sugar Refining Corp.</i>	1975	DR. FRANK G. CARPENTER <i>Cane Sugar Ref. Research Project</i>
1963	DR. GEORGE P. MEADE* <i>Colonial Sugars Company</i>	1976	FRANK C. STAPLES <i>SuCrest Corporation</i>
1963	ALFRED L. WEBRE* <i>Jackson Industries, Inc.</i>	1977	R. STUART PATTERSON <i>California & Hawaiian Sugar Co.</i>
1964	FRANK M. EXLEY <i>Savannah Sugar Refining Corporation</i>	1978	DR. JAMES C.P. CHEN <i>Cane Tech Sugar Consultants</i>
1964	HAROLD J. JACOBS, SR. <i>The South Coast Corporation</i>	1978	DR. MICHAEL C. BENNETT <i>Tate & Lyle Engineering Ltd.</i>
1965	FRANK M. CHAPMAN* <i>Tate & Lyle Refineries, Ltd.</i>	1979	KENNETH R. HANSON <i>Amstar Sugar Corporation</i>
1965	DR. PIETER HONIG* <i>Consultant</i>	1980	FRANKLYN M. WILLIAMS* <i>Calgon Corp., Activated Carbon Div.</i>
1966	WILLIAM H. LOUVIERE* <i>Imperial Sugar Company</i>	1981	ALBERT BERGE <i>Raffinerie Tirlémontoise</i>
1966	PAUL P. WOEHRL* <i>National Sugar Refining Co.</i>	1981	WARREN L. REED <i>Revere Sugar Company</i>
1967	DR. ELLIOT P. BARRETT* <i>Kerr-McGee Chemical Corp.</i>	1982	JOHN V. LOPEZ-ONA <i>The National Sugar Refinery Co.</i>
1967	WATSON A. BEMIS <i>Revere Sugar Refinery</i>	1983	GEORGE W. MULLER, JR. <i>Executive Director, S.I.T.</i>
1968	E. DWIGHT GILLETTE <i>Refined Syrups & Sugars, Inc.</i>	1984	JOHN B. ALEXANDER <i>Tonga-Hulett Sugar Ltd.</i>
1969	DR. PHILIP F. MEADS <i>California & Hawaiian Sugar Co.</i>	1984	DR. MARGARET A. CLARKE <i>Sugar Processing Research Inc.</i>
1969	ELMER J. CULP <i>American Sugar Company</i>	1985	A. MARK HERTZBERG <i>CSR Limited</i>
1970	HENRY G. GERSTNER <i>Colonial Sugars Co.</i>	1985	STANLEY GEORGE <i>B.C. Sugar</i>
1971	STEPHEN STACHENKO <i>Canada & Dominion Sugar Co., Ltd.</i>		

RECIPIENTS OF THE S.I.T. CRYSTAL AWARD

(S.I.T. Achievement Award in Sugar Technology)

- | | |
|------|---|
| 1986 | DONAKD K. LUKE
<i>Sugar y Azucar</i> |
| 1986 | NEIL L. PENNINGTON
<i>California & Hawaiian Sugar Co.</i> |
| 1987 | GEORGE FAWCETT
<i>Savannah Sugar Refinery</i> |
| 1987 | HEIKKI J. HONGISTO
<i>Finnish Sugar Company, Ltd.</i> |
| 1988 | ADOLPH M. BARTOLO
<i>Imperial Sugar Company</i> |
| 1989 | DR. CHUNG CHI CHOU
<i>Amstar Sugar Corporation</i> |
| 1989 | DR. R.A. MCGINNIS
<i>Beet Sugar Institute (Retired)</i> |
| 1990 | JOSEPH A. HARRISON, SR.
<i>Supreme Sugar Company, Inc.</i> |
| 1990 | EARLE J. ROBERTS
<i>Sugar Processing Research, Inc.</i> |

S.I.T. HONORARY MEMBERSHIP

1963 - Dan Gutleben
1964 - Edgar W. Harris *
1968 - Curtis L. Taggart *
1970 - George P. Meade *

* Deceased

** Formerly - Honorary Award

S.I.T. CRYSTAL AWARD - 1990



President Léon Sué presents the Crystal Award

to

Joseph A. Harrison, Sr.

SIT CRYSTAL AWARD - 1990

JOSEPH A. HARRISON

SIT and Joe started together. Joseph A. Harrison began his career in the "Sugar Business" May 6, 1941 as an apprentice electrician at the Quaker Sugar Refinery in Philadelphia, Pa.

He continued his education, going to Temple University evening school.

In June of 1942 his training and education were interrupted by WWII and he served in the U.S. Navy until the beginning of 1946.

He served in several battles in both the Atlantic and Pacific Theaters but managed between battles to attend N.Y.U., Morehead State University, Ky. and William and Mary annex, Va. studying Electrical Engineering. In January 1946 he returned to Quaker Sugar, which was now National Sugar, as Leadman Electrician working on automatic control for packaging equipment, power control and alcohol equipment control, including centrifugal control circuits, with Scotty and Tony Stulreyer of Western States.

He was promoted to Junior Electrical Engineer in 1950 having continued his college studies in Electrical Engineering at Drexel Institute evening college in Philadelphia, Pa.

In 1952 he was promoted to Electrical Engineer and his first major project was the complete conversion of the Philadelphia refinery from direct current power to 3 phase alternating current power. He was promoted to Construction Engineer in 1954 with the responsibility of all new construction, automatic controls and machinery.

He was promoted in 1956 to Night Shift Superintendent with responsibilities for all operations including process, packing, shipping and engineering,

In 1957 he was promoted to General Superintendent responsible for all sugar processing and engineering including maintenance, construction and new projects.

In 1960 he was promoted to Refinery Manager of the Long Island Refinery of National Sugar in New York.

He was promoted again in 1963 to Assistant Vice-President of Operations and moved to Wall Street with responsibilities in operation at all refineries and plant labour negotiations

In 1966 he was asked to join Supreme Sugar Company, Supreme, Louisiana, as Operations Manager and Vice-President of Operations, where he has been since. He started a full carbon plant in 1966 and a Taloflote plant in 1975.

He was involved in the initial alcohol fuels (ethanol or gasohol) program studies from sugar and corn conversion and was also involved in the initial studies of the geopressure, geothermal well in Louisiana with L.S.U. This source has not been used for energy yet, but Joe is convinced it will in the near future.

He also started, with the consent of the SIT Executive committee and board, the Sugar Institute Technology Program at Nicholls State University. He is still the consultant for the school, but only teaches when someone is missing or new courses are added.

He has been active in SIT since 1960 and served on the board and Executive Committee until 1988. He was President of SIT for the Atlanta, Georgia meeting 1981-1982.

Joe has five boys from a first marriage. His first wife died and his second wife of 25 years, Vicki, raised the five boys together with two children of their own. The latter two are still home with them in Supreme. Nine grandchildren await the day Joe retires so Joe and Vicki can spend more time with them.

S.I.T. CRYSTAL AWARD - 1990



President Léon Sué presents the Crystal Award

to

Earl J. Roberts

SIT CRYSTAL AWARD - 1990

EARL J. ROBERTS

Earl Roberts was born in Magee, Mississippi and grew up on the family farm. His father died when Earl was eleven years old, and so, as a young boy, he had heavy farm work responsibilities for some years.

In 1935, after graduating from high school, Earl entered Mississippi College at Clinton, Mississippi, where he played in the National Guard Band, worked on the campus, and in his third year, was appointed Laboratory Instructor in organic chemistry, to help pay his way through. He graduated with distinction in 1939 with a major in chemistry. Employment as a Chemist was very difficult to find at that time, so he took a job as a high school science teacher. After school was out, he took a job with the Mississippi Testing Laboratory testing concrete.

In January 1941 he was appointed a graduate assistant in the Chemistry Department at Louisiana State University. Upon graduation in 1942 with an M.S. in organic chemistry, Earl obtained employment as a Junior Chemist at the U.S. Department of Agriculture, Southern Regional Research Center. He was assigned to work on cotton and peanut proteins and to prepare plywood glue, needed in the war effort, from them. Several papers and patents resulted from this work.

After two years, he transferred to the Agricultural Chemical Research division, and was assigned to work on processing problems in the cane sugar industry. His first accomplishment was to develop a quantitative method for aconitic acid in sugar house products, and then to help develop a commercial process for recovering aconitic acid from cane sugar molasses. The Godchaux Sugar Company built an aconitic recovery plant at Raceland, La, based upon this work, and operated for several years at considerable profit. For this work, Earl was awarded the U.S. Department's Superior Service Award in 1950. Earl continued in sugar research, on the isolation and identification of the non-sugars in sugarcane protein. Earl is responsible for developing the table on "Composition of Sugarcane & Juice Solids" that has appeared in The Cane Sugar Handbook since 1983.

In 1965 this work on sugarcane research was discontinued and Earl was assigned to work on the structure of cotton cellulose as revealed through chemical reactions, which led to many publications and patents. Frequent attempts to lure him to industry or academia did not succeed. Earl remained with U.S.D.A. until 1972, when he retired, and was hired the next day by Dr. Frank Carpenter to work for the Cane Sugar Refining Project, Inc. His first assignment, on acid beverage floc, showed that the most prevalent type of beverage floc resulted from the reaction of an acidic polysaccharide and a small amount of protein, both constituents of sugar-cane and cane sugar. A study of the characteristics of the indigenous polysaccharide, isolated from fresh cane juice showed that it contained glucuronic acid, and was not the pectin reported in old literature. Further study revealed a cane glucan now identified as phytoglycogen. A quantitative method for total polysaccharides resulted from this work.

About this time the presence of dextran, causing false pol and increased viscosity in raw sugar, was identified as an important factor in sugar processing. Earl's background in polysaccharide work led to his developing a specific method for dextran in sugarcane products, which is now the official AOAC method for quantitative analysis for dextran in raw cane sugar.

In 1981, when C.S.R.R.P.I. was reorganized as Sugar Processing Research, Inc. (S.P.R.I.) with Dr. Margaret Clarke as Managing Director, sugarbeet companies began to support the group, and Earl's expertise on plant sugars and polysaccharides is now being applied to sugarbeet processing in addition to cane sugar manufacture and refining. At present, he has reduced his work time to two days per week, and is engaged in research projects on color removal and polysaccharides. Earl has published more than 100 papers and 6 patents. His papers have been presented at all major sugar meetings, and many chemical conferences.

Earl is married to Kirk Lilly and they have a daughter, a son, and triplet grandchildren. In his spare time Earl engages in cabinet making. He has served as a Cub Scout Master, Boy Scout Leader, President of his son's High School Band Booster Club, and as a Deacon in his church.

THE GEORGE AND ELEANORE MEADE AWARD - 1990

The Best Paper #587 presented at the 1989 Annual Meeting by Luis Rocha San Miguel Bento of RAR - Refinarias de Acucar Reunidas, Portugal.



President-Elect, Christian Laur presents the George and Eleanore Meade Award

to

Luis Bento