CLINICAL CHEMISTRY IN HISTORY

BREAKING NEWS:

"BRINGING MOVIES TO LOS ANGELES"

We are now well on schedule with the production of the two movies the History Division will present at one of the Monday afternoon Symposia at the Annual Meeting in Los Angeles in July.

The first of the two movies is about the 50+ years of AACC's history, and acknowledges:

The contributions made by individuals that brought us such success,
The development of our meetings and our publications,
The "Technology Explosion" we have witnessed during our history,
The achievements of the NACB,
Our entry into the "age of the Internet" with Lab Tests on Line,
Why we have a History Division devoted to retaining and documenting the history and individuals that have made AACC what it is today.

This movie has a draft title of

"AACC - What a Great Idea",

but we welcome suggestions. As Producer of this film, I am so grateful for the help and contributions I have already received in preparing the script from Jim Faix, Larry Kricka, Nader Rifai, Sue Evans, Bob Dufour, and Larry Demers. The production of the movie is in the hands of Third Avenue Productions in New York City, a company that that involves two long-time members of AACC, namely Joseph Dooley and Joyce Kuhn.

The second movie is being prepared by Jim Faix from Los Angeles and is most appropriate given the location of the Annual Meeting. Its title is

"Movie Molecules: Clinical Chemistry in Hollywood".

It will be an anecdotal review with stills and clips of how Hollywood has depicted clinical chemistry laboratory procedures over the years. This will be fun and is meant for entertainment and enlightenment of members by showing how we are perceived by the film industry and the public.

The schedule for the showing of these two movies has yet to be determined, but we are contemplating TWO shows.

What do we need from our members to help make this symposium a success? We need the following:

1. Call or e-mail Peter Wilding (610-240-0233 / pwilding@mail.med.upenn.edu) if you have "good" photographic prints or film that might be candidate material for the movie about AACC. NOTE: If you do, communicate NOW as the film is being prepared.

2. If you know of any examples of movie clips that depict our profession then contact: Dr. Jim Faix, (650-736-1857 / jim.faix@stanford.edu)

SUDOKU - With a "Twist"

You play this Sudoku in the conventional way except that the numbers are substituted by nine letters that are an anagram for:

A TERM LINKED OFTEN WITH "PHOSPHATE".

LET US KNOW IF YOU COMPLETE THE PUZZLE AND IDENTIFY THE KEY WORD.

The significant word for the LAST issue was: **HEMOLYTIC**

		I	A	O			R	
			I		D			O
A					X			
I	P					D	O	
O				L				Y
	A	R					I	X
			L					A
P			D		R			
	R			P	A	O		

WHO DO YOU KNOW?

Photos from our archives. Who do you recognize?

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The THREE individuals who were pictured in the **PREVIOUS** issue were all major contributors to the field of clinical chemistry.

They were :

a) **Dr. RONALD LAESSIG**: University of Wisconsin and WI State Laboratory. Award for Outstanding Contributions through Service (1990). Served on BOD's of AACC (1981-84) and NCCLS. Expert in QA and Toxicology. Died 2009

b) **Dr. CHRISTOPHER FRINGS**: Birmingham, AL. Served as AACC Treasurer (1991-94). Award for Outstanding Contributions in Education (1997). A popular and accomplished speaker and talented "Magician". Died 2008

c) **Dr. ROSALYN YALOW**: Bronx VA Hospital Nobel Prize in Physiol. or Medicine (1977) for the development of RIA. Award for Outstanding Contributions in a Selected area of Research (1985). Died 2011

SEVERAL OF THESE INDIVIDUALS HAVE PLAYED MAJOR ROLES IN AACC - HOW MANY CAN YOU IDENTIFY?

Division Officers:

Chair: Peter Wilding, Ph.D., Chair-Elect: Mitchell Scott, Ph.D.
Past Chair; Richard M. Rocco, Ph.D. Secretary: Robert Rej, Ph.D.
Treasurer: David J. Thornton, Ph.D., Staff Liason; Penelope Jones
Consultants: Larry M. Demers, Ph.D., Nathan Gochman, Ph.D., Larry J. Kricka, Ph.D.

FOR COMMENTS ON THE NEWSLETTER, OR TO SUBMIT AN ARTICLE,
PLEASE CONTACT THE EDITOR: ***Peter Wilding***
e-mail (pwilding@mail.med.upenn.edu) or by phone (610-240-0233)

The DuPont ACA

The first Random Access Chemistry Analyzer

Early in 1964, Dr. Donald Johnson, a Manager in the DuPont Instrument Products Division, working with Dr. G. Philip Hicks, Assistant Professor and Dr. Frank Larson, Director of Laboratories at the University of Wisconsin, decided to enter the clinical laboratory instrumentation field. The advice given to Johnson was that he should hire a clinical biochemist with an interest in instrumentation, and so, in June, I became the fourth of a team, consisting of Dr. Don Johnson, Dr. William Truett, an organic chemist, and Gerrit Nieuwoeber, engineer. The thought was to build an instrument based on a photometer that DuPont had developed for use in plant processing control systems.

R. Nadeau and Elbert Carter (designers) 1968

In early August, Bill Truett showed me an idea he had of putting plastic boxes on a belt with reagent pipettes above them. That idea led to why not have the reagents already in the plastic box, so that only the addition of the sample and buffer would be required. Later in discussions with Johnson, the question of optical path length accuracy came up, with the solution of deforming the sides of the box to the precise length which transition into using a plastic pack and just form the optical cell.

Gerrit and I took on the task of designing a pouch that could contain reagents and be formed into an optical cell. After experimenting with many different plastic films, I found a film, later named Surlyn A, which was optically clear, very strong, and could be heat sealed over a wide range of seal strengths, making temporary seals, as well as permanent seals possible. At the same time, I was leading the effort to develop the required methods. The first methods developed were Glucose, based on Glucose Oxidase, LDH, SGOT, SGPT, TP and ALKP. The problem was that there wasn't a good method for BUN. Then, I got the idea of coupling Urease with Glutamic Dehydrogenase, which today is the most widely used enzymatic method for BUN analysis.

The reagent dispensing system for the pack required the development of an entirely new technology of rapidly dissolving reagent tablets. The reagent tablets had to contain the precise amount of active reagent for each test, dissolve almost instantly, but still be hard enough for handling in the manufacturing process. This led to the invention of a spray freeze drying method where liquid reagents were sprayed into a Freon bath causing small spheres to be formed, which then were lyophilized. The resulting freeze dried spheres made making reagent tablets with less than 1% variations possible.

The final pack design contained a large reaction chamber and seven small reagent compartments sealed with temporary heat seals. Four of these reagent compartments were released by breaker mixer one, and after a time delay the remaining three compartments were released by a second breaker mixer, just before going into the photo-meter where the optical cell would be molded and the measurements made.

The DuPont
ACA -IV Pack and System

Also, the pack design had a rigid header which incorporated the ability to have a chromatographic column for preprocessing the sample. Making such a column proved expensive, until Don Johnson happened to sipping a soda and noticed how perfectly made the straw was. He solved the problem by purchasing 3 ft straws from the Sweet Heart Straw Company.

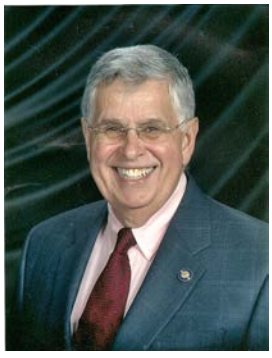
At this point, we were developing a system with rapid and easy changeover between methods, but not the Random Access Chemistry Analyzer which became the hallmark of the DuPont ACA. That idea came later when Bert Carter, an engineering physicist and I were running test packs on Bread Board Model 1. Together we concluded that with a fixed timing cycle on the instrument we could put a bar code on the pack and the instrument would be able to determine what program was needed for each individual test. The instrument program for each method was accomplished by lacing a wire through or not through cores located on the computer board inside the control system. We chose a six bit bar code to allow for the development of 64 methods. Now, we could automate a single test or run multiple tests, in any order behind the sample.

A formal business plan showed that the development costs for the project would be in the neighborhood of $50 million dollars, which would require the approval by DuPont's Board of Directors. Since it was not possible move Prototype 1, the entire Board had to meet in our laboratories, which were located in a converted car dealers building. Prototype 1 performed perfectly until the last Director left the room, and then it proceeded to destroy itself.

With funding approved, a fully operational breadboard was built and in December 1967 was sent to the University of Wisconsin, where Dr. Merle Evenson would perform a seven month evaluation of the system and its first six methods. The results justified going ahead to build the first commercial prototype, which was shown to the world at the AACC annual meeting in Washington, DC in 1968. After my presentation announcing the system concept and one by Burt Carter on the hardware design, Dr. Evenson presented the results of his evaluation in which he found that the instrument did not require recalibration for the entire seven months. The reception was in a word unbelievable.

Technology wise the prototype was the state of the art, with the first instrument having over 100 intergraded computer chips, an 18 bit A to D converter, and a photometer which had less than 1% drift per month. For sample identification, a UV Copy of the sample ID card was printed out on the report slip along with the test results.

In 1969, the first production prototype was sent to Dr. Jon V. Straumfjord's Laboratory at the University of Alabama, where Drs. Billy Perry and Basil Doumas led the evaluation team. Their final results were published in a well received monograph. The 2nd generation production prototypes were then evaluated in Dr. John Henry's Laboratory, at the Upstate Medical Center in Syracuse, NY and in Mercy Hospital in Baltimore, MD. Both of these evaluations proved to be quite successful.



The first commercial DuPont ACA was purchased by the University of Wisconsin and was shipped on December 23, 1970. During the next seven years while I remained with DuPont as Head of World Wide Marketing, DuPont Clinical ACA's were installed in more than 1,500 Medical School Hospitals, community hospitals, and clinics throughout the entire world.

Richard G. Nadeau, Ph.D., FACB

Chairman's Corner:

I am confident that 2012 will be a successful year for the Division. Last year we increased our membership and we have made great progress on some of our programs. As in 2011, the Newsletter will be published three times this year and due to the splendid efforts of Larry Kricka and Ed Neren our Photo Archive of Clinical Laboratory Instruments in growing rapidly. I encourage you all to explore it.

Also, the Division has moved ahead with the films that will be shown during our symposium on July 16th. We are optimistic that these films will be both educational and enjoyable.

I would like to thank Dr. Richard Nadeau for his illuminating article on one of the most successful analytical systems in clinical chemistry from 1970's to the 1990's. The story Dick tells is fascinating and I hope we will receive more of this type of article from individuals or companies that sponsored or created successful systems.

The Retirement Dinner (& Roast) for Rich Flaherty (see photos on page 6) held on November 12, 2011 was a splendid affair and I truly believe it was a piece of AACC history that celebrated his 20 years of outstanding service. The History Division was well represented.

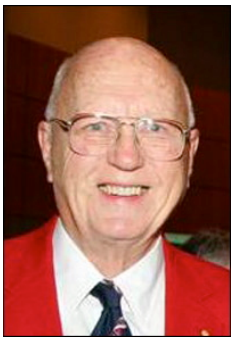
Finally, I hope you will reserve time at the Annual Meeting to attend our symposium and the Division Meeting. There will be more news about both of these in the next Newsletter. Also, I hope some of the readers will give serious thought to serving as an Officer or Consultant for the Division. Please contact the Secretary, Dr. Bob Rej.

ANOTHER DECADE OF OUTSTANDING PRESIDENTS 1971 - 1980:

We continue our salute to another ten outstanding individuals that led the association during the 1980's. During this period the membership grew in size from 2,010 to 5,580. Several of these leaders are still active in the association, and teach, mentor and participate internationally in numerous roles.

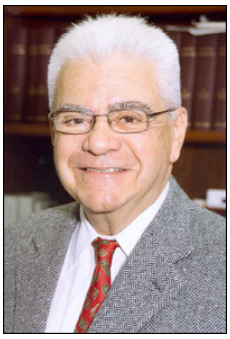
A. Kaplan - 1971

J.H. Boutwell - 1972



R.E. Thiers - 1973

G.N. Bowers - 1974

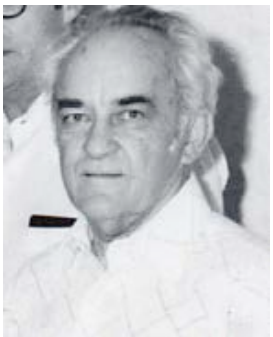


M.K. Schwartz - 1975

R.N. Rand - 1976

N.W. Tietz- 1977

N. Gochman - 1978



A. Dietz - 1979

D.S. Young - 1980

SAYING GOODBYE TO RICH FLAHERTY

On November 12th, there was a farewell party for the outgoing Executive Director, Rich Flaherty who has served the AACC superbly over the past 20 years. The Division considered this an "Historic Occasion" and provided many of the members that made up the group that ROASTED Rich before a large crowd of Past Presidents and BOD members, members, AACC Staff and Rich's family. The "roasters" used a "KITCHEN THEME" and recalled much of Rich's life from his birth to his time with AACC.

Rich

The Flaherty Family

Mrs. F

The Head Chef

Sous Chef

Cold Desserts

Pan Washer

Dish Washers

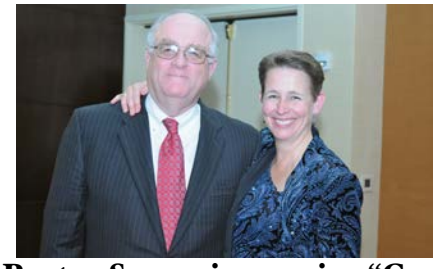
Kitchen Boy

Rich's Birth Certificate

AFilm Message from Rich's 95 yr. Old Father

Sauce Maker (UK)

Fry Cook



The Pantry Supervisor saying "Goodbye"