

## CLINICAL CHEMISTRY IN HISTORY

### UPDATE ON HOUSTON

The annual meeting of the History Division will be held Monday July 29, 2013 from Noon – 1:30 PM in the Houston Americas Hotel - Meeting Room 332. The meeting is open to all History Division Members and lunch will be served. Please RSVP to Mitch Scott at [mscott@wustl.edu](mailto:mscott@wustl.edu) if you plan to attend so that we can plan accordingly. Topics to be discussed will include expanding the Division Archives and making them more easily accessible from the Division website, the possibility of future movies about the History of AACC and its Divisions and means to involve our members in helping with the archives. I hope you can make time in your busy Annual Meeting schedule to attend and contribute to our meeting.



### Carraway-Meites Award

At our meeting in Houston we will also present the Carraway-Meites Award to Dr. Larry Kricka. This award recognizes individuals whose efforts have documented and described the origins, development, and impact of clinical chemistry on the practice of medicine. It is hard to imagine anyone that fulfills the definition of the award better than Dr. Kricka because of his tireless efforts in establishing the Instrument Archives. Please congratulate Larry the next time you see him.



## **Another movie?**

In the last issue of this Newsletter, there is a mention of another (proposed) movie project. It was suggested that the division can play a useful role in recording the history of different divisions in the association, showing the ways in which pioneers of those disciplines embarked on the first efforts to meet a need in clinical medicine.

**DO YOU HAVE AN IDEA WHICH DIVISION COULD BE THE BASIS FOR AN INTERESTING TALE, SHOWN THROUGH THE WORK OF PIONEERS, THE DEVELOPMENT OF METHODS AND TECHNOLOGY AND THE IMPACT THEY HAVE TODAY?**

If so, please send your ideas to the Chair Elect, Dr. Jim Faix or Chair, Mitch Scott

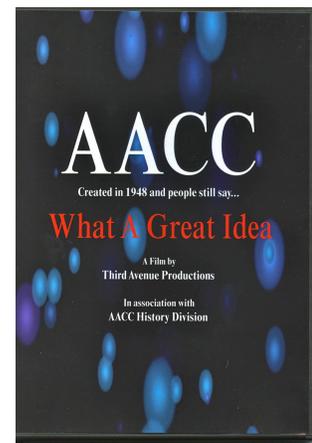
---

### ***Copies of "AACC: What a Great Idea"***

Copies of the movie are available from the Past Chair (Peter Wilding) for \$ 10.00.

Checks should be made out to:

"AACC - History Division". Please send address for mailing. For addresses overseas, there will be an additional charge.



---

### **Division Officers:**

Chair: Mitchell Scott, Ph.D.

Chair-Elect: Jim Faix, M.D.

Past Chair; Peter Wilding, Ph.D.

Secretary: Robert Rej, Ph.D.

Treasurer: David J. Thornton, Ph.D.,

Staff Liason; Michele Horwitz

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 CHAIR: **Mitch Scott**

e-mail ([miscott@wustl.edu](mailto:miscott@wustl.edu)) or by phone (314-362-1503)

---

## ***The Chair's Corner:***

What a tough act to follow! In 2012, under Peter Wilding's leadership the History Division produced a movie about the history of AACC, won the AACC Division Award for Advancing the Profession and presented a poster on the Instrument Archive! We are not going to be able to duplicate those feats this year but we do plan to take on a huge undertaking pending approval by the AACC Board of Directors. The national office has boxes and boxes of photographs, pamphlets, old meeting programs and newsletters. Since the early 2000s there are thousands of digital images from Annual Meetings and other functions. The Executive Committee of our division decided that it might be time to "clean out the attic" and whittle down these collections to a manageable number of items that can be added to our online archives. From this we can envision archives of annual meeting programs, association brochures (see p. 7 of the newsletter), annual meeting photos and photographs of past AACC leadership and committees. This is not a trivial undertaking and will take time but we look forward to starting this effort. If you would like to help please let me know.



I would like to encourage our members to explore some of the archives that are on the Division website already. A reminder of how to get there: 1.) On AACC's main webpage [www.aacc.org](http://www.aacc.org) click on Members, 2.) On the members page click on Divisions in the left column, 3.) On the Divisions Page click on History and links to the three archives will drop down. Alternatively this is the address of the History Division Page <http://www.aacc.org/members/divisions/history/pages/default.aspx#>

The three archives are the instrument archive that Larry Kricka and Ed Neren have put together, the newsletter archive (all the way back to when the division was formed) and the complete archive (including all the advertisements) of the *Clinical Chemist* from 1949 – 1954 which was the predecessor to our journal. All three of these archives are great fun to explore and help us accomplish our mission of preserving our heritage in clinical chemistry. We will let you know as the other archives start filling up. Hope to see you in Houston!

---

## **Pocket reference cards for laboratory test ranges**

Before Blackberry's, iPhones, Droids, iPads, Kindles, phablets and the like, a small, light, easy-to-use information device was the pocket-sized two-sided quick reference card. Figure 1 shows an early example of this type of card. The card is believed to date from the 1950s. This quick reference card lists normal values for common chemistry and hematology tests. It was produced by Nulty Coggins, Inc, a Surgical and Orthopedic appliances company, founded in Philadelphia in 1928 and eventually taken over by JE Hanger Inc. in 1989.

Similar types of cards were also in circulation in the 1960s in hospitals in the UK. For example a plastic card was provided at the General Hospital and the Queen Elizabeth Hospital in Birmingham (UK), as a convenient and easy to use aide for busy clinicians (1). The card contained information on normal values for a selection of common tests (Figure 2). Some of the tests listed, such as the colloidal gold test have fallen into disuse, and for others, the then "normal values",

e.g., serum cholesterol “125 – 293 mg/100 mL (increases with age)”, are now considered very abnormal!

The electronic age has all but swept away this type of information storage device, but some still exist in the form of pocket and badge cards (2-4)! We would be interested to learning of other early examples of this type of card relevant to laboratory medicine. So if you know of any, please send details to: [kricka@mail.med.upenn.edu](mailto:kricka@mail.med.upenn.edu)

Larry Kricka and Peter Wilding  
University of Pennsylvania, Philadelphia, PA

**NULTY • COGGINS, INC.**  
*Surgical and Orthopedic Appliances*  
25 SOUTH SIXTEENTH ST., PHILADELPHIA  
TRUSSES - BELTS - BRACES - SHOES - ARTIFICIAL LEGS, ETC.

**NORMAL VALUES PER 100 c. c. of BLOOD.**

|                                 |               |
|---------------------------------|---------------|
| Sugar                           | 80-120 mg.    |
| Non-Protein Nitrogen            | 25-40 mg.     |
| Urea Nitrogen                   | 10-20 mg.     |
| Creatinine                      | 1-2 mg.       |
| Uric Acid                       | 2-4 mg.       |
| Plasma Cholesterol              | 140-200 mg.   |
| Plasma CO <sub>2</sub> Capacity | 50-75 vol. %  |
| Plasma Protein (total)          | 6-8 gm.       |
| Plasma Albumin                  | 4. 2-5. 4 gm. |
| Plasma Globulin                 | 1. 6-3. 2 gm. |
| Plasma Chloride                 | 570-620 mg.   |
| Serum Calcium                   | 9-11 mg.      |
| Serum Phosphorus (adult)        | 3-4. 5 mg.    |
| Serum Phosphorus (child)        | 4-6 mg.       |
| Serum Bilirubin (Van der Bergh) | 0.1-1 mg.     |
| Icterus Index                   | 4-6           |

**BLOOD COUNT**

**Hemoglobin** Variations in healthy men and women between 14 and 17 grams per 100 cc. of blood. Sahli method based on 14 grams equal to 100 per cent.

**Total Erythrocyte count:** 4.5 million per cumm. for females. 5.0 million per cumm. for males.

**Total Leucocyte count:** 5,000 to 10,000 per cumm.

**Blood Platelets:** 250,000 to 300,000 per cumm.

**Abnormal red cells:** One polychromatic cell may be found normally for every 500 orthochromatic erythrocytes. One reticulocyte may be found for every 500 normocytes.

**Color index:** Normal .85 to 1.0 Normal or reduced in secondary anemia. Reduced in chlorosis, polycythemia vera. Increases in pernicious anemia, hemolytic jaundice, during crises.

**Schilling index:** 1-16. (Ratio of shift cells (myelocytes plus juveniles plus stabs) to segmenters).

**Multiple index:** 1. (The Schilling index multiplied by 16). It represents a comparison with a normal Schilling, and the degree of toxicity.

**Factor index:** Normal 40

**NULTY • COGGINS, INC.**  
*Surgical and Orthopedic Appliances*  
25 SOUTH SIXTEENTH ST., PHILADELPHIA  
TRUSSES - BELTS - BRACES - SHOES - ARTIFICIAL LEGS, ETC.

Quick reference card (front and back): Courtesy of Marilyn Senior, Department of Pathology and Laboratory Medicine, University of Pennsylvania Medical Center, Philadelphia, PA

Figure 2

| Blood Plasma and Serum           |  |
|----------------------------------|--|
| Amylase                          | 60-180 units/100ml.  |
| Ascorbic acid (fasting)          | 0.3-1.3 mg/100 ml.   |
| Bilirubin (total)                | 0.1-0.8 mg/100ml.  |
| Bromosulphalein                  | Less than 5% of 5 mg/kg body weight retained 45 minutes after injection. |
| Calcium                          | 9.2-10.4 mg/100 ml (serum total protein is of importance here).          |
| Carbon dioxide (combining power) | 24-33 meq./litre.  |
| Carotene                         | 60-180 micrograms/100 ml.  |
| Chloride                         | 99-110 meq./100 ml.  |
| Cholesterol (total)              | 125-293 mg/100 ml (increases with age).                                  |
| Cholesterol esters               | 60-80% of total cholesterol.   |
| Colloidal gold test              | 0.   |
| Creatinine                       | 0.8-1.3 mg/100 ml.   |
| Fatty acids (total)              | 7.8-15.6 mmols/litre.  |
| Fibrinogen                       | 200-400 mg/100 ml.   |
| Glucose (fasting)                | 60-110 mg/ml.  |
| Iodine (protein-bound)           | 3.5-7.5 micrograms/100 ml.   |
| Iron                             | 80-180 micrograms/100 ml.  |
| Iron binding capacity            | 300-400 micrograms/100 ml.   |
| Oxygen (arterial saturation)     | 96-98%.  |

Contents of plastic card of normal values circulated in the General Hospital and the Queen Elizabeth Hospital in Birmingham, UK in the 1960s (1).

#### References

1. Wilding P. Practical experiences in the designation of reference intervals. In: Grasbeck R, Alstrom T, Solberg HE, eds. Reference values in laboratory medicine. Chichester: Wiley, 1981:223-232.
2. Borm Bruckmeir Publishing. Normal Values Pocketcard Single Card, 2005
3. Scrubs and Stuff LLC . Lab Values Horizontal Badge ID Card Pocket Reference Guide, see <http://escrubsandstuff.com>.
4. Scrubs and Stuff LLC. Lab Values Vertical Badge ID Card Pocket Reference Guide,

---

### The AACC Oak Ridge Conference: A Look Back

I just attended the AACC's 45th Annual Oak Ridge Conference in Baltimore, Maryland (April 18-19, 2013), and it was the usual excellent collection of presentations on evolving technologies that impact clinical diagnostics. After a while I started to reminisce about this meeting which retains the city of its origins in the title but is held elsewhere. The conference started at the Oak Ridge National Laboratory (ORNL) in 1967 in the small city of Oak Ridge, Tennessee, near Knoxville. ORNL was the World War II home of the massive gaseous diffusion plants that were used to separate Uranium isotopes for the atomic bombs. Following the war the laboratory was engaged in various biomedical research projects including the development of the centrifugal analyzer in the 1960's.

Dr. Charles D. Scott of ORNL and Dr. Robert Melville of NIH organized the first Conference with the theme of "Tomorrow's Technology Today". I had the privilege of attending some of the early meetings in Oak Ridge and enjoyed the atmosphere of an advanced scientific meeting in a rural setting. Dr. Carl Burtis, an AACC Past President, was on the ORNL staff at the time and participated in organizing many of the programs. In 1979 the AACC became a co-sponsor of the Conference and eventually became the manager in 1985. The Oak Ridge Conference continued to be an important venue for the introduction

of new clinical laboratory instruments and technologies in the ensuing years. A more extensive discussion of this topic was published in Clinical Chemistry, September 1998, by Katie M. Smith.

Nathan Gochman, PhD, FACB  
AACC Past President



## UPDATES:

### 1. **HISTORYDIVISIONCONSULTANTS:**

Traditionally, the division Executive includes THREE consultants, who are appointed by the Chair. For the past two years, the consultants have been Drs. Laurence Demers, Nathan Gochman and Larry Kricka. If you are interested in participating in this way, please contact the Chair for 2013-2014, Dr. Mitch Scott.

### 2. **JIM FAIX'S MOVIE CLIPS ON YOUTUBE:**

The short film prepared by Dr. Jim Faix for our "movie fest" at the Annual Meeting, titled "Movie Molecules: Clinical Chemistry in Hollywood" is now available on YouTube ([www.youtube.com/watch?v=K6rmGiZGV\\_M](http://www.youtube.com/watch?v=K6rmGiZGV_M)). For those of you who have not seen this, it is well worth seeing.

### 3. **REQUESTFORARTICLES:**

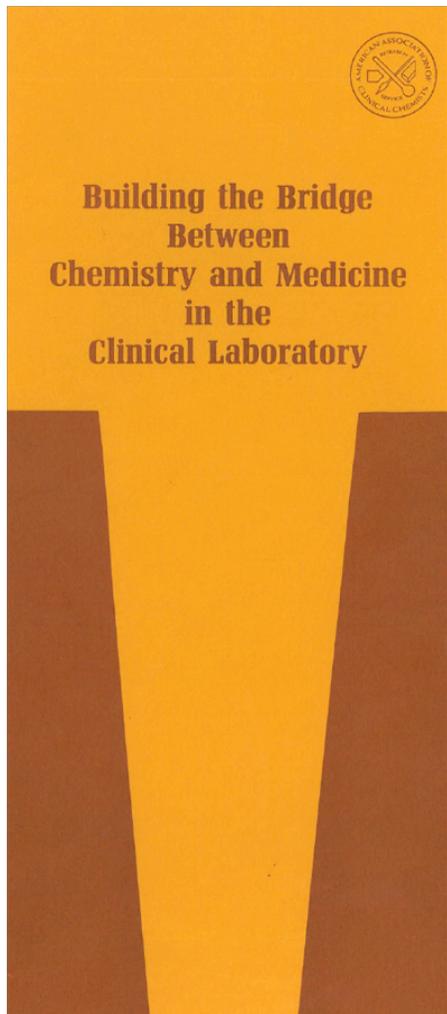
The Editor of the Newsletter is always pleased to receive articles or suggestion. During the past three years we have published short articles about other "sister" organizations around the world and about the origins and development of significant instruments that changed the practice of clinical chemistry. **Please send in your contribution.**



This photo was taken at a function at the 1981 AACC meeting in Kansas City, MO. If anyone can help identify some of these folks (themselves?) please send the information to Mitch Scott.

## 1970 AACC Recruiting Brochure

The following images are from a 14 page membership recruitment brochure from 1970 that was given to me by Dr. Jack Ladenson. It boasted that the association now had 1600 members. This is an example of the types of items we would like the archives to include.



**Organization**

The Association is governed by two groups: the Board of Directors and the Council. The Council consists of the officers and at least one member from each local section. It serves as the popular deliberative body of the Association. The Board of Directors consists of the officers, the immediate Past President, and six elected members. It is responsible for the policy activities of the Association. Most of the Association's activities result from the recommendations made by appointed committees of the Board and Council.

An Executive Director assists the Board and Council in promoting the activities of the Association through its national office in Washington, D.C.

The President-Elect, Secretary, Treasurer, Directors, and the Nominating Committee, are elected by voting members of the Association.

**Table of Organization of the AACC**

```
graph TD
    MEMBERS[MEMBERS] --> BOARD[BOARD OF DIRECTORS  
Officers  
Past President  
6 Elected Members]
    MEMBERS --> COUNCIL[COUNCIL  
1. One Councilor per Section  
2. One additional Councilor for each 40 members of a Section in excess of 40.]
    BOARD --> ED[EXECUTIVE DIRECTOR]
    ED --> COM1[COMMITTEES  
1. Awards  
2. Ethics  
3. Board of Editors  
4. Finance  
5. Professional Relations  
6. Standard Methods  
7. Standards]
    COUNCIL --> COM2[COMMITTEES  
1. Annual Meetings  
2. Constitution and Bylaws  
3. Education  
4. Employment and Personnel  
5. Historical  
6. Membership  
7. National Nominating (elected)  
8. Public Relations]
```

The diagram is a hierarchical organizational chart. At the top is a box labeled "MEMBERS". Two lines descend from "MEMBERS" to two boxes: "BOARD OF DIRECTORS" (listing Officers, Past President, and 6 Elected Members) and "COUNCIL" (listing 1. One Councilor per Section and 2. One additional Councilor for each 40 members of a Section in excess of 40.). A line descends from "BOARD OF DIRECTORS" to a box labeled "EXECUTIVE DIRECTOR". From "EXECUTIVE DIRECTOR", two lines descend to two boxes labeled "COMMITTEES". The left "COMMITTEES" box lists: 1. Awards, 2. Ethics, 3. Board of Editors, 4. Finance, 5. Professional Relations, 6. Standard Methods, 7. Standards. The right "COMMITTEES" box lists: 1. Annual Meetings, 2. Constitution and Bylaws, 3. Education, 4. Employment and Personnel, 5. Historical, 6. Membership, 7. National Nominating (elected), 8. Public Relations.



## Introduction

In the early part of this century a handful of individuals, devoting their scientific talents to problems in medicine, established the field of clinical chemistry. These men were true pioneers. They studied and developed methods for measuring constituents of human body fluids in health and disease. Such measurements not only broadened basic knowledge of cellular metabolism, physiology, and nutrition, but provided data for the physician thereby giving him greater diagnostic acumen. These pioneers include S. R. Benedict, W. R. Bloor, Otto Folin, P. A. Shaffer, Michael Somogyi, and D. D. Van Slyke. Prior to their work a few illustrious organic chemists had paved the way for this chemical specialty, notably von Liebig, Wohler, Pasteur, and Emil Fisher.

While the early chemists were primarily oriented toward metabolic research and teaching, it soon became apparent that they were needed to service the fast growing chemical specialty in clinical laboratories, particularly in the larger hospitals and medical teaching centers. As a result, many were working full time as clinical chemists by the close of World War II.

The inevitable happened. On December 15, 1948, at the invitation of Harry Sobotka, a small group of clinical chemists met at the Mount Sinai Hospital in New York City to discuss problems germane to clinical chemistry.<sup>1</sup> As a result, a national organization was formed, and people elsewhere in the U.S. were invited to participate in the early organizing efforts. The American Association of Clinical Chemists, Inc. was officially chartered by the State of New York in the spring of 1949.

Since 1949 the Association has grown rapidly.<sup>2</sup> With an initial membership of about 200, the organization exceeded 1,600 members by 1969. The Association grew from the single Metropolitan New York Section in 1949 to 19 Sections by 1967.



**Harry H. Sobotka (1899-1965).** A founder, charter member and first President of the AACC. He was Director of the Department of Chemistry of the Mount Sinai Hospital, New York City, from 1928-1965. His research output included more than 300 papers.



**Donald D. Van Slyke (1883- ).** A leading pioneer in clinical chemistry. He was a research chemist at the Rockefeller Institute from 1907 to 1948, and has filled a similar post at the Brookhaven National Laboratory since 1948. His scientific work encompasses almost the whole of clinical chemistry, including the chemistry and pathology of proteins, studies of enzyme activity, measurements in blood chemistry, the metabolic basis of diabetes and nephritis, the physiology and chemical pathology of electrolytes, water and blood gases, and micro-manometric analyses.