

1910–1918: Getting started

Methods, Smalley's samples, and independence

In 1909, nine analytical chemists attending the Interstate Cottonseed Crushers Association (ICCA) in Memphis, Tennessee, USA, decided to form a new organization to standardize analytical methodology. The following year at the ICCA meeting in Little Rock, Arkansas, they formally organized. The first challenge: deciding how to produce uniform analytical methodology.

George Willhite

On May 26, 1910, at the Marion Hotel in Little Rock, Arkansas, the president of the Interstate Cottonseed Crushers Association (ICCA) shared a letter from Felix Paquin at the crushers' business meeting. Paquin's note said:

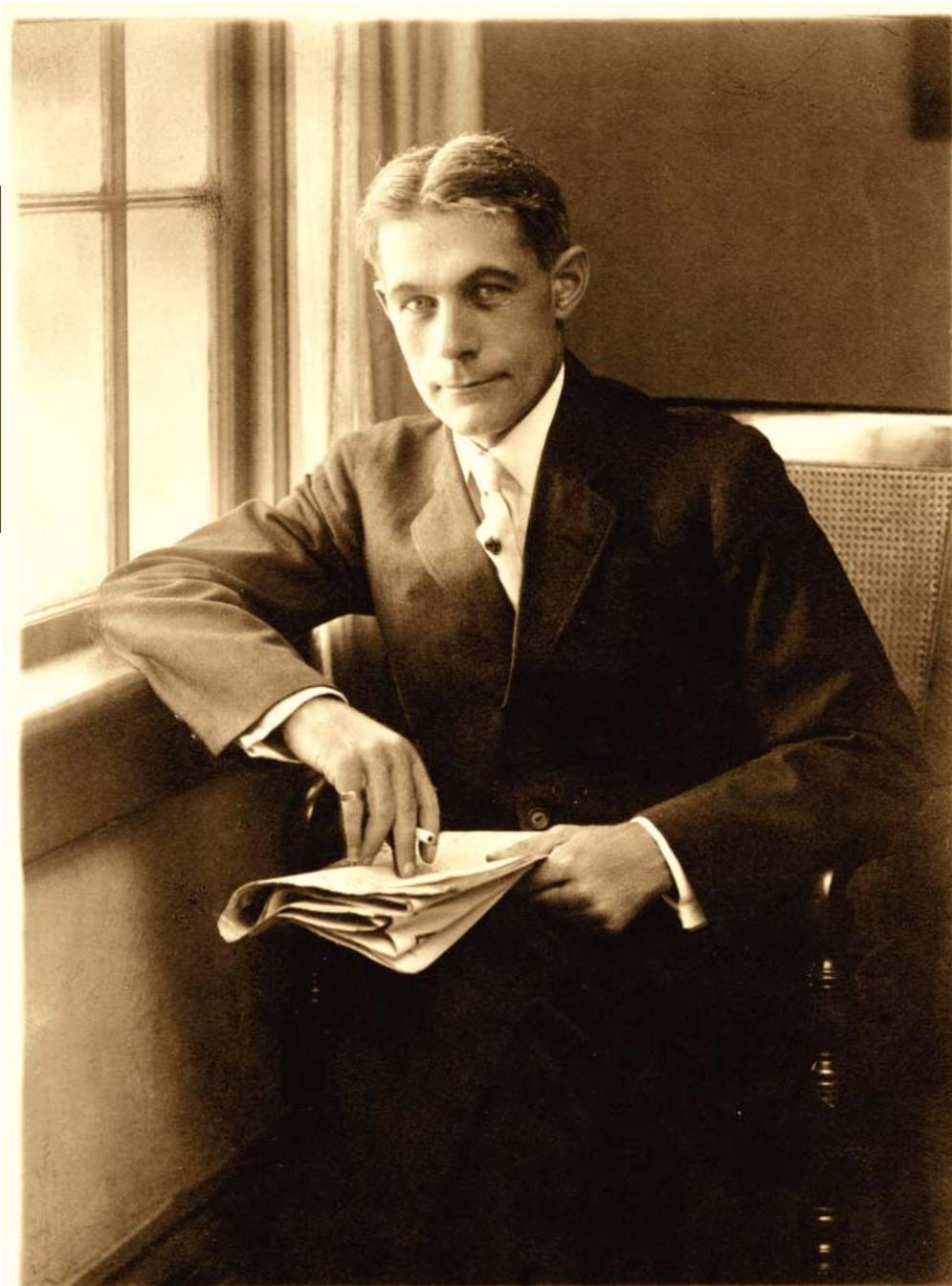
We wish to advise you that the chemists attending this convention have organized the Society of Cotton Products Analysts with sixteen charter members.

The objects of this society are to foster co-operative work among the chemists who are engaged in the analysis of cotton products to the end that methods of analysis may be standardized and more uniform results secured by its members.

It is the intention of this society to hold annual meetings at the same time and places as your Association, provided there is no objection to the plan.

*Respectfully yours,
Felix Paquin, President*

The meeting proceedings note there were no objections to the new organization. The ICCA at its 1909 meeting had appointed a chemists' committee (Felix Paquin, E.R. Barrow, E.L. Johnson, F.N. Smalley, and R.C. Warren) to develop written methods for the industry to use to determine product quality.



Frank Smalley

Prior to 1909, the cottonseed crushers had a group of refining chemists whose charge was to "give any arbitration chemists pointers on how to refine oil to get the best results," H.S. Mitchell, chairman of the AOCS refining committee three de-

acades later, wrote in a 1945 committee history. But no method was published—all pointers were delivered orally.

By 1911, with the aid of the methods panel of the SCPA (Society of Cotton Products Analysts), a method for determining

1910

Society of Cotton Products Analysts (SCPA) officially organized in Little Rock, Arkansas. Felix Paquin elected first president.

Procter & Gamble begins using the Sabatier-Normann-Kaiser process for hydrogenating vegetable oils.

International Association of Seed Crushers founded.

1911

Corn Products Co. introduces Mazola oil, made from corn oil.

Herman Meyer in Seattle uses hydraulic presses to process imported soybeans (may be first soybean crushing activity in United States).

Procter & Gamble introduces Crisco shortening to retail trade.

1912

Association of Dutch Seed Crushers founded, to become part of VERNOF in 1973.

First U.S. Department of Agriculture (USDA) statistics on linseed oil production from domestic and imported linseed estimate: 541 million pounds.

Paul Sabatier receives Nobel Prize in chemistry for his work on hydrogenation of organic compounds.

Frank Smalley's check sample program expanded to include non-Southern Cotton Oil Co. labs.

1913

Bethlehem (Pennsylvania) Oil Mill, first oil mill in colonial America, shuts down, closed because the water reaching the mill was contaminated; the mill had begun producing linseed oil in 1745.

Society of Cotton Product Analysts Annual Meeting in Chicago at LaSalle Hotel, first meeting independent of Cottonseed Crushers Association.

I.G. Priest of U.S. Bureau of Standards named first honorary member for his work on oil color grading.

1914

Connstein and Lüdecke investigate production of glycerol by fermentation.

G.C. Hullbert notes SCPA has sold more than 860 of the 1,000 moisture dishes made for analysts' use.

1915

American Association of Cereal Chemists founded.

Elizabeth City Oil & Fertilizer Co. in North Carolina begins processing domestically produced soybeans.

Gossypol's toxic properties discovered by Withers and Carruth.

H.S. Bailey of USDA named second honorary member of AOCS.

1916

AOCS creates an "associate member" category for large corporations contributing to the society.

Irving Langmuir investigates monomolecular films of fatty acids.

M. Tsujimoto establishes composition of squalene found in shark liver oil.

1917

Cellulose acetate made into a synthetic fiber manufactured from cottonseed linters (1917–1919).

Cotton Oil Press begins publishing, has "Chemists Section" provided by SCPA and edited by G. Worthen Agee.

First use of Expeller press to crush soybeans, by Chicago Heights Oil Manufacturing Co.

AOCS appoints "sample committee" to work on methodology for best ways to take samples.

1918

A.E. Staley, owner of a starch-producing company, begins investigating soybean processing.

AOCS Annual Meeting in New Orleans; first AOCS annual meeting to run more than one day

refining loss in crude cottonseed oil was published, Mitchell wrote, but the instructions were "indefinite." For example, one sentence read, "The proper amount of lye of the desired strength is then added and the mixture stirred vigorously for five minutes."

Would other analysts join the new society outlined in Paquin's 1910 note? Four more members joined the fledgling group fairly quickly, and are listed as among the 20 charter members. The new society agreed to meet for one day each year in conjunction with the crushers' annual meetings.

Considerable horse-trading went on behind the scenes to get the SCPA off to a smooth start.

"The name was chosen because very few of us had received [a] real chemical education, and had been trained as laboratory assistants, making mostly routine tests," David Wesson would write in 1927. "It was a very interesting occasion and some fine political work was done to see that particular companies should receive as much influence as possible in the make-up of the new society."

The political work included an informal agreement to alternate the one-year presidency between an analyst from a commercial or independent analytical laboratory and one from a manufacturing firm. Felix Paquin was re-elected president in 1910, with David Wesson from the American Cotton Oil Co. to follow in 1911, then E.R. Barrow in 1912, and Southern Cotton Oil's Frank Smalley in 1913. The first constitution also specified the Uniform Methods Committee should have five chemists, two of whom would be manufacturers' chemists and the other three commercial or arbitration chemists.

At the 1912 meeting in St. Louis, too few members attended for a formal business session, but that was the year that an analytical proficiency program started by Smalley began to expand beyond the Southern Cotton Oil laboratories that he supervised.

Smalley's program has endured. After he became chief chemist for Southern Cotton Oil in 1909, Smalley prepared cottonseed samples each week at his Savannah, Georgia, laboratory and mailed them to other company sites for analysis for ammonia (as an indicator of nitrogen content) and oil content. When the outlying sites' results arrived in Savannah, Smalley could

See the beginning of this timeline, as well as the first installment of this yearlong historical series, by viewing the April issue of *inform* available at <http://www.aocs.org/press/inform/>.

determine if a laboratory had produced a deviant result and let those laboratories know to check their equipment and their procedures.

AOCs Charter Members

G. Worthen Agee	Landon C. Moore
E.R. Barrow	Felix Paquin
H.B. Battle*	Rex W. Perry
G.G. Fox	J.B. Pratt
R.B. Hulme	Edwin F. Scherubel
Edward Lehman Johnson	David Schwartz
W.J. Kallaher	Frank N. Smalley
Thomas C. Law*	P.S. Tilson*
E.A. McDonald	R.C. Warren
William Hogue Marquess Jr.*	David Wesson

* = Not listed among attendees at the Little Rock crushers' association meeting, but formally joined new society during 1910.

In 1912 several independent analysts asked Smalley if they could participate in his check sample system. By 1915, Smalley's program had been adopted as an activity by the six-year-old society's Uniform Methods Committee (UMC), which Smalley headed. Other members included Barrow, Warren, Thomas C. Law, and G. Worthen Agee. The UMC check sample program included cottonseed meal, crude oil for refining tests, and oils for free fatty acid determination. The program is now known as the Laboratory Proficiency Program. The UMC is one of three original committees still operating, along with the governing committee and the membership committee.

The original UMC typically responded to requests from the Interstate Cottonseed Crushers Association's Chemists' Committee to investigate a specific analytical problem. The Smalley network of analysts provided potential collaborative study volunteers.

AOCs Presidents (for biographical sketches published in *Oil & Soap* see "For further reading," page 310)

1910	Felix Paquin	1915	G.G. Fox
1911	David Wesson	1916	T.C. Law
1912	E.R. Barrow	1917	Archibald Campbell
1913	Frank Smalley	1918	P.S. Tilson
1914	G. Worthen Agee		

The new society became active in trying to improve methods for determining color in refined oils, bleached oils, and other products. The task required more than just collaborative studies by members. The analysts enlisted the aid of Irwin G. Priest, who was chief of the Optics Division's Colorimetry Section at the National Bureau of Standards.

The project yielded specifications for measuring color with Tintometers or other color-reading devices as well as a requirement that dispute settlement analyses be done with red color lens-



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For further reading

Meet your Past President . . .

- Felix Paquin,
Oil & Soap 23(4):15 (1946)
 - David Wesson,
Oil & Soap 23(6):13 (1946)
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Oil & Soap 23(5):12–13 (1946)
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Oil & Soap 23(7):18–19 (1946)
 - G.G. Fox,
Oil & Soap 23(8):18 (1946)
 - T.C. Law,
Oil & Soap 23(9):19 (1946)
 - Archibald Campbell,
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 - P.S. Tilson,
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- AOCS charter members, *JAACS* 61:61–64 (1984)
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 - The first 30 years (of AOCS), *JAACS* 60:1227–1234 (1983)
 - Society of 9 now numbers 4,000, *JAACS* 61:55–58 (1984)
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 - Biographies: David Wesson, *Oil & Soap* 10(3):56 (1933)
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- Impressions of the European Soap Industry, Describing many varieties of plants and manufacturing methods encountered on a tour through western Europe, by Archibald Campbell, *Oil & Fat Industries* 8(2):67–69 (1931)

- A Message to Members of the American Oil Chemists' Society, *Oil & Soap* 9(1):18 (1932)

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- Society boasts 11 who have been members at least 50 years, *JAACS* 54:712A–715A (1977)

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AOCS Meetings

1910	Little Rock
1911	New York City
1912	St. Louis
1913	Chicago
1914	New Orleans
1915	Birmingham
1916	Memphis
1917	Dallas
1918	New Orleans

es that had been tested and graded by the U.S. Bureau of Standards.

Society president E.R. Barrow opened the 1913 meeting, the organization's first meeting held independently from the crushers' organization, by noting, "We have assembled here [Chicago] in what is our Fourth Annual Meeting, but in reality, our first actual Convention. Formerly we have met at such odd intervals as presented themselves between the programme of the Crushers' Convention, and our meetings have been more or less in the nature of informal gatherings during which our discussions have been at random, and often curtailed by the interference of other engagements."

Priest became AOCS' first honorary member at that 1913 meeting at which he presented a paper. The analysts' group had 38 members (including one from Mexico) and a dozen of them attended the Chicago meeting. A second government worker who aided the Society of Cotton Products Analysts in improving methodology was H.S. Bailey. He was working for the Bureau of Chemistry of the U.S. Department of Agriculture (USDA) when elected as an honorary member in 1915. Bailey later would succeed Smalley as chief chemist at Southern Cotton Oil Co. and become editor of the society's journal.

The society's proceedings for 1914 include a letter from Charles Parsons, secretary of the American Chemical Society (ACS), inviting the analysts to become an ACS "section," with the possibility to eventually become a division with more independence. There is no record of any response during the meeting to the ACS letter.

It became a point of pride for society members to do well in their analyses of oil, ammonia, and moisture in the check sample program.

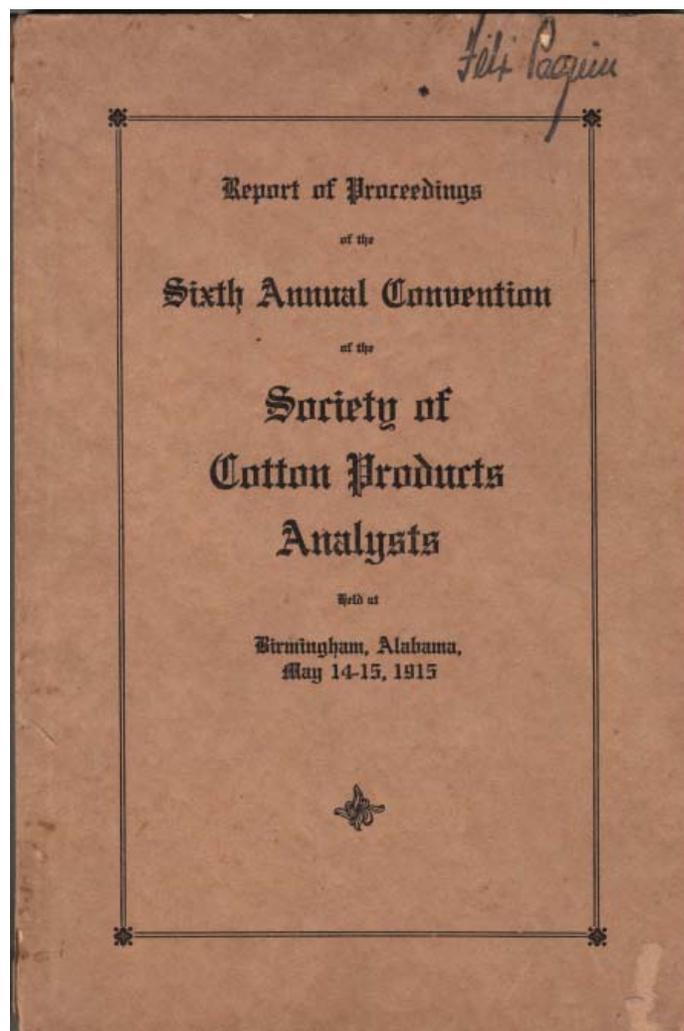
The 1914 meeting was scheduled to be a one-day event on Saturday, May 14, but a talk by Priest was moved to Monday, April 16, to permit persons attending the crushers' conference to attend.

In 1915, the SCPA meeting became a two-day affair. President G. Worthen Agee told the group that there had been many changes since the 1909 founding: "We were, at the beginning, divided by conflicting interests, petty jealousies and suspicions. The independent or commercial laboratories were often jealous of one another, and the independent and the works chemists held each other in suspicion. There was friction and distrust and secretiveness."

But in 1915, Agee said he believed that "there is a feeling of good fellowship, of belief in the other fellow's good intentions."

It was at this meeting that the society discarded the provisions that the Uniform Methods Committee had to have two corporate chemists and three independent chemists.

In 1916, the SCPA appointed a committee to consider whether to begin its own publication. The group also decided it needed a separate committee to pursue improvements in laboratory refin-



Felix Paquin's signature on this copy of the proceedings for the 1915 AOCS Annual Meeting indicates it probably was AOCS' founding president's personal copy. Proceedings of meetings were published in pamphlet form in early years, but this is the earliest proceedings in AOCS files. Later, the proceedings were published in journals.

ing methodology. It would take a decade to develop a satisfactory method, and then after a research chemist was hired for six months with aid of a grant from the cottonseed crushers association.

Any recommendations to adopt or change a method by the SCPA methods committee usually were adopted by the ICCA for its methodology book. In 1928 the analysts' society, which by then would have a new name, would publish its own book of methods.

The analysts' early meetings consisted of technical committee reports on new analytical techniques; the results members reported from using new techniques; and administrative reports on finances, membership, and election of officers. There were discussions of how to prepare samples for distribution and whether a method should be a "recipe," with directions for each analytical step, or simply provide a general statement.

It became a point of pride for society members to do well in their analyses of oil, ammonia, and moisture in the check sample program. Discussions at annual meetings covered what statistical

methods should be used to determine who was atop the analytical pyramid. Smalley sometimes agreed, sometimes disagreed with others on that topic, but analysts considered the check sample program vital to gauging their analytical proficiency.

The young society found another way to aid cotton product analysts. At that time, many chemicals and some glassware were imported from Europe. The SCPA began to offer standard sodium carbonate and standard ammonium sulfate. The society also offered official moisture dishes of the standard size and shape needed to determine moisture accurately.

The annual dinner during the 1916 meeting in Memphis found 40 to 50 participants sitting around one large table, a report many years later said. The society also created an “associate” membership category that year for companies that were contributors to the society.

The 1917 meeting was pivotal, for it approved the start of a publishing program, but not an independent publication as had been proposed in 1916. The crushers’ organization introduced a monthly *Cotton Oil Press* in May 1917. The analysts were invited to prepare a quarterly “chemists’ section” beginning with the July 1917 is-

sue. Uniform Methods Committee member G. Worthen Agee, Paquin’s former partner in Memphis, became section editor. Members no longer had to wait until an annual meeting (or for a friend to send a letter or report) to find out what was happening in their organization. By this time the organization had 85 regular members—it had grown nearly tenfold in eight years.

Edwin Leman Johnson, one of the society’s founders, applied for readmission to membership in 1917. He told the society he had dropped out of the society about 1913 when the SPCA spent “three or four hundred dollars for a colorimeter. I thought it was a pretty heavy expense and I dropped out.” He was duly voted back into membership.

By 1918, U.S. cottonseed production had reached 5.3 million tons. Approximately 85% of U.S. cottonseed was being crushed compared with 64% in 1909. Food-stuff prices had risen sharply during World War I with cottonseed oil selling for about \$343 a ton in 1918—a gain of 300% over the \$112 per ton price of 1909. Prices for hulls, linters, and cake and meal basically had doubled.

The focus for the society’s first decade had been primarily on cottonseed.

New members were bringing new interests to the society—soap was becoming a major topic. Statistics for a new farm crop called soybeans began appearing in USDA crop production reports. In 1915, Archibald Campbell had proposed the society compile data on chemical composition of “peanut, soja bean and cotton seed oil” to aid in settling potential future disputes if the oils were mixed.

The SCPA would have to keep adapting to meet the challenges of its second decade. How could it serve an increasingly diverse membership—both in terms of interests and geography?

George Willhite, who is preparing this series of articles as AOCs’ centennial historian, retired from AOCs in 2002 after 27 years as a member of its publications staff. He is an honorary member of AOCs. He can be contacted via e-mail at: willhite@aocs.org.

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