Introduction to the 53rd John Arthur Wilson Memorial Lecture

by

Steven Gilberg

Anthony Dale Covington obtained the Graduateship of the Royal Institute of Chemistry (now the Royal Society of Chemistry) at Teesside Polytechnic (now the University of Teesside), then a PhD in physical organic chemistry at Stirling University under the supervision of R.P. Bell FRS, followed by post-doctoral research in physical chemistry at the University of Newcastle upon Tyne, the city of his birth.

In 1976 he joined the British Leather Manufacturers' Association (later to become BLC the Leather Technology Centre in Northampton, UK), where he spent 18 years engaged in research and development, industrial consultancy and problem solving. He was exposed to a wide range of aspects of the global leather industry during this time, particularly working in different types of tanneries around the world. In 1995 he was appointed by Nene College, later to be The University of Northampton, to teach leather science in the British School of Leather Technology, becoming Professor of Leather Science in 1996.

His career in the leather industry spans more than 35 years, producing *inter alia* 55 lectures in 12 countries around the world, 24 doctoral graduates and over 260 technical publications. His most recent publications include, *Tanning Chemistry: The Science of Leather*, published in 2009 by the Royal Society of Chemistry. In recognition of this achievement, the American Leather Chemists Association gave Professor Covington the Alsop Award in 2011. He is a Fellow of the Society of Leather Technologists and Chemists and a Fellow of the Royal Society of Chemistry.

Professor Covington gave his first John Arthur Wilson Memorial Lecture at the ALCA Annual Convention in 1998. He is a former President of the International Union of Leather Technologists and Chemists (1995-7) and in 2009; the IULTCS gave him their Merit Award for Excellence in the Leather Industry. He is currently semi-retired as an Emeritus Professor.

Dr. Covington presents the Wilson Lecture in his academic robes

Leather Science: Requisite or Requiem?

by

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Abstract

The current state of leather science (not leather technology) in the global leather industry is reviewed. The review focuses on the following questions. Is leather science still required by the leather industry: if so, to what purpose? What remaining problems should be addressed?

Recent trends in leather science research are analysed in terms of the published topics over the last twenty-five years and the sources of the publications in JSLTC and JALCA, as representative of the global research programme.

The current state of knowledge is compared to the understanding of leather science in recent decades, where appropriate. Predictions of industrial and technical requirements made in the past are discussed with regard to the progress made to the present day by leather scientists.

The final questions. Is leather science a luxury the leather industry cannot afford? And, if leather scientists should be needed, from where can they be found?

Resumen

El presente estado de la ciencia del cuero (en ningún caso la tecnología del cuero) en la industria del cuero mundial es revisado. La revisión se enfoca en las siguientes preguntas. ¿Es aún requerida la ciencia del cuero por la industria del cuero: si sí lo es, ¿Con qué objeto? ¿Que problemas no resueltos requieren ser enfocados?

Tendencias recientes en la investigación de la ciencia del cuero son analizadas en términos de los temas publicados en los últimos veinticinco años y los orígenes en las publicaciones en JSLTC y JALCA se consideran como representativas del programa de investigaciones a nivel mundial.

El corriente estado de conocimientos es comparado con el entendimiento alcanzado por la ciencia del cuero en las últimas décadas, en dónde sea apropiado. Predicciones acerca de los requisitos técnicos e industriales realizados en el pasado son revisadas en términos del progreso alcanzado hoy por los científicos del cuero.

Las preguntas finales. ¿Es la ciencia del cuero un lujo que la industria del cuero no podría afrontar? ¿Y si los científicos del cuero fuesen requeridos, en dónde los podríamos encontrar.

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Introduction

This article is a personal analysis and view of the current state of leather science. Therefore, unusually for a scientific publication, it is written mostly in the first person. Although objectivity is maintained as much as possible, the outcome is subjective; it is the way I see things.

In this thesis, it is important to distinguish the difference between science and technology: technology is the practical application of science. In other words, science provides the possibilities for industries to create wealth. That is not to say technology and science are two completely separate notions or activities: they are two sides of the same coin. Nor can we fudge the issue by defining some subjects as 'applied sciences'. As Pasteur observed: "*There are not applied sciences... there are only applications of the science and this is a very different matter. The study of the applications of science is very easy to anyone who is the master of the theory of it*."

The primary role of leather science is to provide the understanding of the principles and mechanisms underpinning leather making steps, which then allows the improvement of current processes and the development of new processes and products. Without that fundamental understanding, research and development in the subject is merely 'trial and error', an inefficient way of working, which at best is slow and at worst a waste of time and effort.

In 1994, Heinz Mayer delivered the Atkin Memorial Lecture to the Society of Leather Technologists and Chemists at their Annual Conference.[1] As a former employee of the British Leather Manufacturers' Research Association and later a leading tanner in UK, he had a clear view of the role of leather science in industry. He spoke as follows.

"*We need 'pure' scientists who are specialists in their field, and who can explain, in the simplest way, the complexities of their field to those who want to use this knowledge and work in the practical production of leather.*"

In this way, he was separating the roles of the scientist and the technologist, emphasising the importance of 'technology translation', that is, explaining to practitioners how to exploit the scientific principles of their industry.

This is a view that concurs with the truism that it is easier (and perhaps more effective) to turn a scientist into a leather technologist than it is to turn a leather technologist into a scientist. However, in the modern era of specialisation and commercial (or employability) awareness, the latter is more likely to be the situation in the future than the former. I was lucky in my education to be exposed to an ideal (although unplanned) curriculum: a degree in general chemistry, a doctorate in physical organic chemistry, post doctoral research in physical chemistry, 18 years of leather research and development and consultancy with BLMRA/BLC, then over ten years of academic research at the University of Northampton. This is a mixture of experiences that is unlikely to be repeated.

It is generally agreed that the 'Father of Leather Science' was Henry Richardson Procter, who, amongst his many contributions to the industry, trained John Arthur Wilson during the period 1914-16. Whilst I would not over-estimate my contribution to the body of knowledge by making comparisons to Procter's seminal creation of the subject of leather science, I did come across some interesting parallels, separated by a century,[2] as set out in Table I.

Figure 1. Henry Richardson Procter (courtesy JSLTC.)

Opportunities for the education of potential leather scientists are under threat because of the shrinking of the leather education sector. In 2009, Ferenc Schmel produced a review for UNIDO of education and training in the leather sector worldwide.[3] In that comprehensive study, he included a list of institutions which provide leather education: an edited version is presented in Table II, with an indication of the extent of leather science provision.

TABLE I
Career paths.

Procter	Covington
Brought up in Tynemouth, Tyneside UK	Brought up in Whitley Bay, Tyneside UK (two miles apart)
Educated at Bootham School, York (Quaker boys school)	Educated at Ackworth School, Pontefract Yorkshire (Quaker co-ed. school)
Equivalent of chemistry degree 1869	Graduate of the Royal Institute of Chemistry 1969
Newcastle upon Tyne Chemical Society 1876-1890	Post doctoral research, Newcastle University, 1976-1978
Published *Textbook of Tanning* 1885 Published *Principles of Leather Manufacture* 1903	Published *Tanning Chemistry. The Science of Leather* 2009
Second President IALTC, 1898	President IULTCS, 1995-97
Permanent Chair of Leather Industries, University of Leeds, 1896	Professor of Leather Science, University of Northampton, 1996
Emeritus Professor, 1918	Emeritus Professor, 2008
DSC, Leeds University 1914	DSC University of Northampton, 2010

Table II
Leather education around the world.

Institution	Country	Leather science?
Bangladesh College of Leather Technology	Bangladesh	✓
Centro Tecnologico do Couro (SENAI)	Brazil	✓
Sichuan Union University	P.R. China	✓✓
Servicio Nacional de Aprendizaje	Colombia	
Thomas Bata University, Zlin	Czech. Rep.	✓
Lederinstitut Gerberschule Reutlingen (relocating to FILK, Germany)	Germany	✓
Anna University, CLRI Chennai	India	✓✓
Instituo per l'Industria for Tanning Chemistry 'G. Galilei'	Italy	✓
National Institute of Leather Technology	Pakistan	✓
Leather Industries Research Institute, Rhodes university	South Africa	✓
Igualada School of Engineering	Spain	✓
Ege University	Turkey	✓✓
BSLT/Institute for Creative Leather Technologies	UK	✓✓✓

While Table II may or may not be complete, it does indicate that centres for teaching leather science with technology are not great in number, thereby limiting the opportunity for prospective leather scientists to enter a subject which serves a very large global industry. The alternative is to learn leather science in an institute specialising in leather. Schmel summarised the leather institutes around the world, presented in an edited version in Table III, with an indication of activity in leather research.

Whilst this list may or may not be complete, support for the national leather industries is available, but typically more in the fields of testing/analysis and commerce, than providing scientific or even technological research.

The Traditional/Conventional View of Leather Science Principles

In 1929, John Arthur Wilson published The Chemistry of Leather Manufacture.[4] This presented the theoretical aspects of the subject, as they were understood at the time: naturally, formulation of theory was limited by the stage of development of chemistry at the time and the analytical techniques available to support observations. Consequently, he wrote: "*In this field of seemingly infinite complexity, it is not surprising to find conflicting ideas of the mechanism of chrome tanning.*"

In 1943, Dorothy Jordan-Lloyd, then the Director of the British Leather Manufacturers' Research Association (BLMRA), gave a lecture to the Royal Institute of Chemistry on the subject of leather.[5] By her own admission, she mainly discussed the histology and physics of leather, but little of the chemistry, ending the talk with these words: *"...the tanner... must be alive to the fundamental scientific principles of all the processes...*"

Whilst it is clear she recognised what is required by the leather industry in terms of science, 70 years ago a fundamental

TABLE III
Leather institutes worldwide.

Institute	Country	Research active?	Institute	Country	Research active?
CITEC	Argentina	✓	TSCLI	Japan	
CRC-CLO	Belgium		KIRDI	Kenya	
CTCC	Brazil		CIATEC	Mexico	
IBTeC	Brazil		ARMONO	Mongolia	
LACOURO	Brazil		ISMC	Morocco	
CORD	Canada		LASRA	N. Zealand	✓
CEINOVA	Colombia		LRC	Pakistan	
CLFI	P.R. China		NILT	Pakistan	
CIDEC	Cuba		CITECCAL	Peru	
ITC	Czech. Rep.		IPS	Poland	
LLPTI	Ethiopia		CTIC	Portugal	
CTC	France		KIFLT	Korea	
FILK	Germany	✓	CERTEX	Romania	
LGR	Germany		ICPI	Romania	
ElKeDe	Greece		IRCC	Sudan	
BIMEO	Hungary	✓	CNCC	Tunisia	
CLRI	India	✓	TFRA	Taiwan	
CLRP	Indonesia		BLC	UK	✓
IRDLAI	Indonesia		LATU	Uruguay	
CEQ	Italy		TCA	USA	
CIMAC	Italy		LIZ	Zimbabwe	
SSIP	Italy	✓			

understanding was not available. This is also clear from the important treatise on leather science, published by her organisation five years later. 'Progress in Leather Science: 1920-45' is a comprehensive snapshot of the state of the subject at that time.[6] However, the book is more an assembly of data than a summary of scientific principles. In part this is because such principles had still not been satisfactorily formulated: this is exemplified by the introductory remarks to the chapter on mineral tanning from Joan Bowes:

'*Various theories have been put forward to account for the tanning action of chromium and other metal salts; these theories, however, are largely the result of speculation, and while some appear more probable than others, none of them can be considered to be more than attractive suggestions*.'

The seminal volumes edited by O'Flaherty, Roddy and Lollar in 1958 were a significant step forward, defining the status of leather science some sixty years ago.[7] The apparent developments in the subject in the intervening 10 years after the BLMRA treatise probably derive from the activities of important leather scientists, such as the bitter rivals Gustavson and Shuttleworth. The middle part of the 20th century might be considered to be the golden age of leather science, corresponding to the expansion of sciences in general and chemistry in particular. Also, research and development was funded by governments and industry so progress in the subject was rapid. Funding and associated progress were not to last.

PREDICTIONS AND COMMENTS

In 1987, Robert Sykes reviewed the needs for research and development for the 21st century, as perceived by research directors around the world.[8] Perhaps unsurprisingly, the responses were dominated by technological considerations. The ranking of research priorities in research objectives was as follows.

Rank 1	Cost reduction
Rank 2	Clean technology
Rank 3	More consistent production
Rank 3	Improved performance

Cost reduction was viewed primarily in terms of increased productivity, straight through processing equipment and robotics for hide handling. Less important were accelerating processing, increasing yield, more efficient use of chemicals and solvent free finishing. In the quarter century since his review was published, little has been published on speeding up processing, although the principle of raw to wet blue in 24 hours has been demonstrated.[9] Nevertheless, the principles of the limits to process acceleration have not yet been defined. Yield has usually been treated as an outcome of mechanical treatment and set.[10,11] A more effective way is use biotechnology, so that the properties and performance of the leather are not compromised: treating wet blue with a formulation of protease and elastase can achieve this apparently contradictive result.[12] The efficient fixation of reagents onto collagen or modified collagen is better understood, allowing predictable improvements in processing effect and efficiency.[12]

The new scientific concepts suggested that might find application in the forthcoming 15 years were as follows, in decreasing frequency of citation.

(i) Covalent tannages with lubricating and filling properties

(ii) Biotechnology in the beamhouse

(iii) Positive injection of process chemicals

(iv) Instrumentation of grading and sorting

(v) Use of robotics/computers

(vi) Greater use of microwave energy

(vii) Polymer chemistry in finishing

Now, 25 years on, it can be seen that significant progress has been made, confirming at least some of the thinking of those research directors. The first concept has been met to a degree: although the polyacrylate ester Lubritan agents react covalently with bound chromium(III) to lubricate and fill (depending on the chemical structure), they would not ordinarily be categorised as tanning agents. The principle of covalent tanning has been developed within the link-lock mechanism,[13] so that routes to the development of new products have become more predictable.[14] Biotechnology is now established in the beamhouse, beyond conventional bating,[12] for soaking, unhairing, opening up, removal of individual skin components, area gain etc. However, their potential has yet to be fully investigated and implemented in industry. Injection of process reagents was demonstrated in principle in trials undertaken at the tanning school at Reutlingen, under Pauckner[15] but the later development of the Krause Penetrator was unsuccessful due to design shortcomings. Such technology might be made to work for the industrial scale, but there is no incentive to pursue this concept. Automatic grading and sorting can be done,[16] but at a high cost to achieve the required resolution; therefore this is currently not viable technology for the leather industry. Robotics for material handling and computer control are now commonplace and increasingly used throughout production. Microwave energy has been shown to have application in the tannery, for drying and finishing, but in practice these techniques are not commonly used in industry. Nowadays, polymer science is at the heart of finishing technology, whether solvent based or, more typically aqueous based.

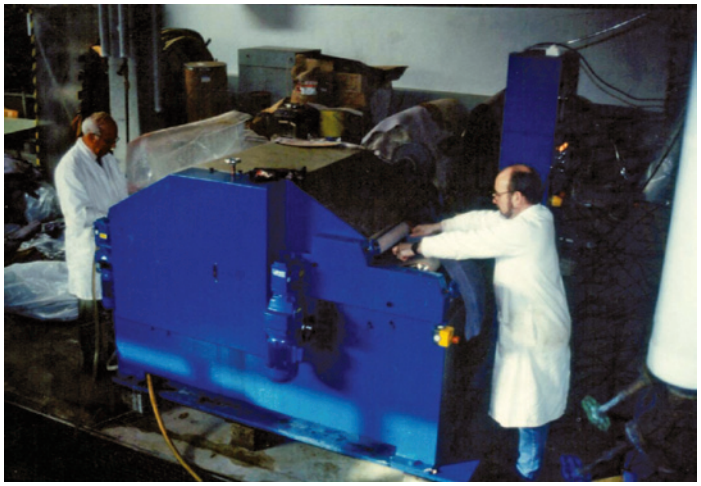

Figure 2. The Krause penetrator: proven principle, but ineffectual industrial translation.

Five years later, Sykes reviewed progress:[17] now, 20 years on from then, the extent of progress can be gauged against predictions made of the key objectives, set out as follows.

- Wider application of existing knowledge in a holistic way
- Environmental audits, clean technology
- Better understanding of the fibre network interactions
- Maximising area yield
- Elimination of non-substantives from fibre networks
- More intelligent use of polymers
- Assured consistent performance

The first objective concerns the development of principles in leather science, overviews of how processes and reactions work, allowing the prediction of processing outcomes and the requirements of new reagents to confer desired outcomes. A start has been made,[14] but there are still large gaps in our

knowledge preventing us from modelling processing quantitatively. Clean technology is now embedded in the international leather industry, through eco-labels and similar schemes, but the industry is still troubled by the application of 'baggage' in the form of 'one size fits all' clean technology, without analysing local problems then synthesising local solutions. A theoretical understanding of collagen structure through modelling is still a long way off, although some progress has been made.[18-20] Area yield is a constant parameter of interest to tanners and received some attention from leather scientists, notably Jeyapalina's and Attenburrow's work on set and viscoelastic changes to modified collagen as a function of water content and temperature[21] and the development of NovoCor AX, an enzyme formulation applied to wet blue.[12] Opening up is typically still a relatively crude series of operations, employing high alkalinity and general proteases: some progress has been made to define the specific requirements, but this has not yet changed industry much. Polymer science is routinely exploited in finishing and to a lesser extent in wet processing. Consistency in processing and production outcomes depends on a fundamental understanding of the principles involved, as outlined above: such understanding is limited by the slow progress towards the elucidation of reaction and process mechanisms.

Review of the Changing Face of Leather Science Publications

The slowing of progress in leather science over the past three decades is illustrated by the books on the subject published over the period.

- Physical Chemistry of Leather Making: K. Bienkiewicz, Krieger USA, 1983
- Fundamentals of Leather Manufacture: E. Heidemann, Roether Germany, 1993
- From Collagen to Leather – the Theoretical Background: G. Reich, BASF, Germany, 2007
- Tanning Chemistry. The Science of Leather: A.D. Covington, Royal Society of Chemistry Publishing, Cambridge UK, 2009.

Four treatises in thirty years might appear to indicate a lack of activity, but it probably more accurately represents the lack of scientists with the necessary overview to advance the subject in a general sense.

It is useful to review the changing face of leather science. Arbitrarily, I have chosen to review the last thirty five years, in part because that covers the majority of my time in the leather industry. One way in which the state of the subject might be measured would be the programmes of the Congresses of the International Union of Leather Technologists and Chemists Societies. However, the programmes are individually designed by the host societies to reflect topics of the day and hence may not accurately indicate activity across the whole subject. In addition, the Congresses are traditionally more technological than scientific.

As a simple guide to global scientific activity, the contents of the Journal of the American Leather Chemists Association and the Journal of the Society of Leather Technologists and Chemists have been reviewed. Whilst they are not the only learned journals in the field, they have for a long time been the two more important refereed journals. The results are presented in Tables IV-VI, in which the content is simply categorised as either science or technology, depending on the major thrust of the text (although it is recognised that many of the papers sit firmly at the overlap of science and technology), country of origin is presented (where Europe includes both west and east, and Indian sub continent refers overwhelmingly to India), together with a score relating to the importance of the papers, in terms of both scientific and technological impact. In the analysis, review papers/articles have been excluded: although they can be useful in bringing work together, here, only work which generated new (as opposed to rearranged) knowledge was assessed. The scoring system is based on the following criteria and reflects my reaction to the content and experience in the field. Since the scoring is highly subjective it is useful only in terms of perceived trends; consequently, statistical analysis is inappropriate, although it is useful to note the error in the mean score is probably ±0.2.

Score	Criterion
1	Some new information, but minimal value to other scientists or technologists
2	Some merit, with minor contribution to the body of knowledge and applicability
3	Useful for progressing knowledge and for the practical tanner
4	Very useful in terms of information and techniques
5	Seminal paper, important progress for the global leather industry

From Table IV, the following trends in JSLTC publications can be observed.

- The distribution of nationalities of authors is consistent over the period, until 2004, when the influence of the volume of Chinese research begins to dominate.

TABLE IV
Publications in JSLTC 1976-2010.

Year	Origin				No. of papers		Av. score	
	Europe	North America	Indian sub cont.	China	Science	Technology	Science	Technology
1976	5	0	3	0	2	8	3.0	4.1
1977	8	0	2	0	4	14	3.7	4.1
1978	7	0	0	0	1	9	4.0	3.8
1979	6	1	0	0	0	12	-	3.2
1980	5	0	0	0	1	8	5.0	4.0
1981	10	0	0	0	3	8	4.0	4.6
1982	11	1	1	0	12	5	4.2	3.6
1983	5	0	1	0	5	5	3.8	4.4
1984	8	0	2	0	5	7	3.4	3.1
1985	7	0	3	0	1	13	2.0	3.6
1986	9	0	1	0	2	13	4.0	2.9
1987	6	0	4	0	13	7	3.5	3.3
1988	10	0	1	0	9	9	4.2	3.9
1989	6	0	3	0	9	8	4.0	2.7
1990	9	0	1	0	8	6	3.9	3.2
1991	17	0	3	0	11	9	3.0	3.2
1992	10	0	0	0	4	9	4.0	2.9
1993	11	0	3	0	9	9	2.9	3.1
1994	15	0	2	0	7	13	2.9	3.7
1995	8	0	5	3	10	10	3.0	2.7
1996	13	0	4	1	12	10	3.2	2.3
1997	12	1	10	0	16	12	3.0	2.9
1998	16	1	1	0	11	11	3.4	2.9
1999	30	2	3	2	20	22	3.5	2.6
2000	23	2	3	4	19	21	3.1	3.0
2001	12	0	4	5	12	11	3.2	2.0
2002	15	0	1	4	10	21	2.5	2.4
2003	13	0	3	6	4	22	2.4	2.5
2004	9	0	7	16	14	25	2.3	2.3
2005	9	0	7	20	24	16	2.5	2.2
2006	16	0	1	20	22	20	2.7	2.2
2007	14	0	2	22	23	16	3.0	2.3
2008	14	1	3	19	22	15	2.9	2.8
2009	13	0	4	20	21	18	2.7	2.3
2010	14	0	1	15	21	14	2.3	2.3

- The standard of science papers is relatively consistent up to the early 90's, when scores begin to decline. Graphically, the decline appears to have a periodicity of about 10 years, although this is probably making too much of the variation of the scores.

- Technology scores are slightly lower than the science scores, which seem to correlate inversely with the number of publications. It is apparent that more papers are being published, but they are typically relatively short to the point of being more like Communications than traditional technical papers. This was judged to detract from the impact and value of the work.

TABLE V
Publications in JALCA 1976-2010.

Year	Origin				No. of papers		Av. Score	
	Europe	North America	Indian sub cont.	China	Science	Technology	Science	Technology
1976	4	15	4	0	9	18	2.9	2.8
1977	1	13	0	0	3	14	3.7	2.9
1978	1	16	3	0	6	16	3.5	2.4
1979	1	16	1	0	0	18	-	2.3
1980	3	12	2	0	5	14	3.2	2.9
1981	2	12	1	0	5	14	3.8	2.9
1982	2	16	0	0	4	15	4.2	2.7
1983	2	15	0	0	4	13	3.5	2.8
1984	3	12	2	0	3	16	4.3	3.1
1985	3	10	1	0	5	12	3.2	2.9
1986	2	12	0	0	6	13	3.7	3.3
1987	4	8	0	0	5	15	3.4	3.0
1988	4	10	3	1	8	13	3.5	2.8
1989	5	10	2	1	5	19	4.0	3.1
1990	11	12	2	1	13	17	4.1	3.5
1991	9	13	3	0	11	17	4.4	3.1
1992	8	10	0	0	8	12	4.4	3.5
1993	8	10	0	0	7	11	4.9	4.2
1994	12	9	0	0	9	15	4.3	3.5
1995	5	5	0	0	4	7	4.0	3.6
1996	6	11	1	0	7	13	4.4	3.5
1997	4	10	1	0	5	10	4.8	3.7
1998	6	9	2	0	4	14	5.0	3.1
1999	8	15	2	0	4	23	4.7	3.7
2000	10	6	6	1	11	13	4.5	3.8
2001	9	13	11	3	10	28	4.4	3.3
2002	11	16	8	2	14	27	4.2	2.7
2003	10	16	13	2	10	32	3.8	3.4
2004	13	8	17	2	15	27	3.9	3.0
2005	15	10	11	5	10	32	4.3	3.5
2006	14	13	16	4	20	27	4.1	3.3
2007	21	9	6	3	15	28	4.1	3.2
2008	12	12	17	6	17	31	3.9	3.2
2009	8	12	11	8	17	23	3.6	3.2
2010	20	5	8	5	12	31	3.2	3.0

- In the last 10 years, the same numbers of science and technology papers were published: this does not necessarily reflect the amount of research being done, but may just indicate the standard of research in the different fields and acceptability for publication.

From Table V, the following trends in JALCA publications can be observed.

- Over the period science scores rose up to the late 90's, then began to decline.

- The technology scores remained relatively constant, exhibiting a small increase over the period, but are slightly lower than the science scores.

- As might be expected, the content and higher quality publications are dominated by the Agricultural Research Services laboratories at Wyndmoor, PA.

- In JALCA there is little Chinese influence, but a significant contribution by volume from Indian research, particularly from the turn of the millennium.

- As for JSLTC, the number of papers published has recently increased and their length decreased: this had the same effects on scoring.

In Table VI, the results from JSLTC and JALCA have been consolidated in blocks of five years: the following trends can be discerned.

- The number of papers published in the journals has increased by 250% over the period, excluding reviews and general articles, which are more prevalent in JALCA than in JSLTC.

- Over the review period, there is a rough trend of increasing proportion of scientific papers, at the expense of the technological papers.

- Science scores rose from the 70's into the 90's, but then began to decline.

- Technology scores have been relatively consistent over the last 35 years.

General conclusions can be drawn from this analysis as follows.

1. The emphasis in the journals seems to have shifted from technology towards science. Such a change will necessarily alter the roles of the journals in the leather industry.

2. The traditional (20th century) sources of leather-based research, Europe and the USA, are no longer the dominant players, now overtaken by China and India. This reflects the regions of major leather production in the world.

TRENDS IN THE GLOBAL LEATHER INDUSTRY

A large part of the culture of science is mentoring of the newer generations of scientists by active, experienced scientists, either through direct supervision of research or by acting as role models via their publications. It seems the world of leather science is between generations if the state of the leather scientists' population is considered. In Table VII, some of the leather scientists of note from the last forty years or so are listed, including all those offered by Graham Lampard as the most influential post 1970.[22]

The older scientists in Table VII are either retired, approaching retirement or acting as consultants, which is not strictly the same as undertaking scientific research. The indicative (but clearly not exhaustive) list in Table VII suggests the active leaders of leather science constitute about a fifth of the numbers 20 or 30 years ago.

In 2010, Redwood et al. reviewed trends in the leather sector for UNIDO.[23] They observed: "*...it is clear that there has been a definite decline in the number of academic papers being published and also the amount of fundamental research being done*."

The first point is probably not true, based on the data in Table VI, although it is true there has been a decline in the number of journals published in the field. The second point is not borne out by the data in Tables IV-VI, above, although it is possible to distinguish between scientific research and

TABLE VI
Total publications in JSLTC and JALCA 1976-2010.

Period	Total no. of papers	Proportions of papers (%)		Average scores	
		Science	Technology	Science	Technology
1976-1980	162	19	81	2.9	3.2
1981-1985	155	30	70	3.6	3.3
1986-1990	198	39	41	3.8	3.2
1991-1995	183	44	56	3.8	3.3
1996-2000	257	42	58	4.0	3.1
2001-2005	354	32	68	3.3	2.8
2006-2010	413	46	54	3.2	2.9

TABLE VII
Leather Scientists of recent years.

Scientist(s)	Country	Current status
Money	Australia	Retired/ consultant
Gutterres	Brazil	Active
Cot, Marsal	Catalunya	Approaching retirement
Shi	P.R. China	Active
Rabinovich	Colombia/USA	Retired/ consultant
Kolomaznik	Czech. Republic	Active
Folachier, Vulliermet, Aloy	France	Retired
Heidemann	Germany	Deceased
Reich	Germany	Retired/inactive
Germann	Germany	Active
Ramasami	India	Moved on/ inactive
Langerwerf	Netherlands	Retired/inactive
Das Gupta	New Zealand	Retired
Adzet	Spain	Retired/active
Sykes, Attenburrow	UK	Retired/inactive
Covington	UK	Semi retired/ active
Brown, Taylor, Liu	USA	Active
Bailey,	USA	Retired/ consultant
Komanowsky, Kronick	USA	Retired/inactive
Lollar, Shelly	USA	Deceased

fundamental research — they are not necessarily the same thing. They go on to say: "*The introduction of the European legislation REACH (Registration, Evaluation, Authorisation, and Restriction of Chemicals), along with other environmental concerns, has meant that the research expenditure of the chemical companies has moved much more towards compliance*."

The emphasis has changed from research to testing/analysis, so from the supply houses' point of view, leather science is clearly a luxury they cannot or can ill afford. It may well be true that there has been a reduction in fundamental leather based research across the world. Such a shift in research effect is understandable when scientists are expected to deliver results which can be readily translated into technology and the changing face of research means that few institutions have the gifted lead scientists and the critical mass of scientists in their groups to undertake fundamental research.

OPINION

Fourteen years ago, I gave the John Arthur Wilson Memorial Lecture on the subject 'New Tannages for the New Millennium'.[24] At that meeting I outlined the challenges for the new millennium as follows.

- Refinement of general tanning theory. Since then, the link-lock theory has been refined to the point of usefulness[13] and it is gradually receiving acceptance.

- Advanced computer models of collagen — enabling calculated thermodynamics of tanning interactions and extending modelling to post tanning interactions. Some progress has been made, notably by Ellie Brown's group and others,[18-20] but recently there has been little published, probably because of the cost of this work in terms of computing capacity and the lack of immediate spin off.

- New tanning polymers, tailor made with respect to dimensions and reactivity. The supply houses continue to make slow progress in developing new tanning reagents: the Lanxess and Clariant products, X-tan and EasyWhite respectively, are current exceptions. But the idea of creating specificity is still undeveloped.

- New crosslinkers, based on active hydroxyl function. The thought here was the type of chemistry exemplified by oxazolidines. This remains an undeveloped field.

- Calculation of changes in isoelectric point and changes in pH-charge relationships These parameters are the key to fixation reactions: although estimates can be made of the effects of processing on IEP,[14] there is still no basis for firmly quantitative changes.

- Prediction of leather properties and performance from the chemistry of process reagents. Only recently has there been a first attempt to codify the means by which outcomes of process steps can be predicted.[14] However, without a deeper understanding of the thermodynamics of these reactions, prediction remains typically qualitative and at best only semi-quantitative.

Having seen something of the changes and the progress made in leather science over the last few decades, it is useful to consider what big questions remain.

(i) The mechanism of tanning

For the foreseeable future, the global leather industry will rely on chromium(III) tanning. However, the perception of the mechanism has been stuck since the 50s and the research published by Gustavson. It has taken half a century for an alternative view to be presented, in which the conventional concept of direct crosslinking of collagen is challenged and the notion of stabilisation by matrix is argued.[25]

Although the tanner tends to focus on the steps by which pelt is stabilised, this actually encompasses all the processes in which reagents are bound to the pelt. A general mechanism of tanning has been proposed, the 'link-lock' mechanism, in which moderate stabilisation is conferred by any and all single reagents, due to the moderate effect on the process of hydrothermal unravelling of the triple helices, but high stability can be reached when a second reagent synergistically creates a new matrix with the first reagent, making unravelling much more difficult:[13] the requirement for higher energy for unravelling is observed as high hydrothermal stability. The accumulated evidence for this new way of thinking is compelling, but it would be useful to confirm the view by rigorous molecular modelling.

An additional aspect of tanning or reagent fixation is the general mechanism by which any reagent is transported from the solution phase to the solid phase, then interacts chemically to become bound. A stepwise mechanism has been proposed, in which phase change for the reagent is driven by its relative affinity for the solution or substrate. Thereafter, chemical reaction depends on initial electrostatic interaction, possibly followed by covalent reaction.[12]

Using these two theories allows much of the outcome of reactions to be predicted, but in a qualitative or semi-quantitative manner.[14] Translating that thinking into a comprehensive, quantitative model is more difficult. Part of the problem is a lack of information concerning the impact of process steps on the isoelectric point of the pelt as it changes during leather making and the way in which chemical bonding and bound quantities affect subsequent process steps in an accumulative manner. Modelling of this sort should be achievable.

(ii) Chromium(VI)

Despite the occasional dissenting voice,[26] it is generally agreed, at least within the global leather leather industry, that chromium(III) discharged into the environment is not converted to chromium(VI) to a degree which would be of concern.[27] However, the notion that chromium(III) is oxidised within chrome leather under certain circumstances does persist. Here, the phenomenon remains ill-defined because conventional analytical methods are capable of introducing false positives. The solution must be to use an analytical technique that does not rely on oxidation state, perturbing the outermost electrons in the chromium species. One candidate is EXAFS (extended X-ray analysis fine structure), using the signal observable in the K-edge.[28]

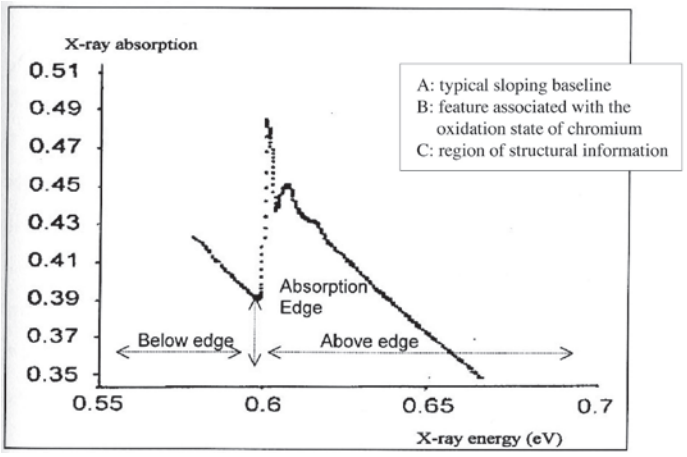

Figure 3. The K-edge absorption of X-rays by chromium in leather.

(iii) Limits to performance

In order to ensure the continuing use of leather as a versatile material, the industry must consolidate present applications by continuing to improve the properties and performance of current products. But, more than that, extending the application of leather can be achieved by determining the limits to performance and properties. Despite leather being merely a chemically modified protein, extraordinary properties can be conferred, in terms of hydrothermal stability and mechanical resistance to applied forces. However, what are the limits to strength, resistance to impact, softness, stiffness, fire resistance, water resistance, particle or wave radiation damage etc.?

OVERVIEW

In one of his Blogs of 2011,[29] Mike Redwood posed the question: 'Who is Tony Covington?' This title was a vehicle for commenting on the need for leather science teaching. Importantly, this raises the wider issue of 'who will train the trainers?'

As Tilman Taeger said in his John Arthur Wilson Memorial Lecture of 1996:[30]

"*So, where are they, the J.A. Wilsons?*

Owing to the necessity of specialising and focusing on a certain area, scientific allrounders like Atkins, Procter and Wilson will surely become even rarer, and if they are found, they will certainly not stumble by mistake into the hard-hit sector of leather manufacture."

...as I did!

In 1983, Heidemann gave the John Arthur Wilson Memorial Lecture (31) with the title 'How can we help to solve the problems of practical tanners using fundamental research?' He said: "*New ideas are necessary... This is possible only if we get into another level, in which new knowledge is broadened or deepened by occupying ourselves with the explanation of technical processes and mechanisms*."

In 1973,[32] Shuttleworth posed the following question to the ALCA: Can the US leather industry survive without research? In his presentation, he opined: *"...there is no question of being able to isolate the US tanning industry from research."*

Fifty years ago, Harold Turley gave the 1962 John Arthur Wilson Memorial Lecture,[33] the third of its kind, speaking of 'Tanning Research in Retrospect and Prospect'. He said: "*What do we need to bridge the gap between scientific research and leathermaking? The times are serious and something must be done. We cannot wait for a rigid proof of the chemical formulation of a chrome complex and the exact manner of combination with the collagen fiber.*"

"...it will be possible to make improvements at will instead of relying on haphazard trials of many ideas and many materials which are offered with frequently no understanding of their value or even of their worthlessness."

In this way, Turley was pointing out the necessity for research, preferably as close to industry as possible, since the benefits are clear.

Plus ça change, plus c'est la même chose.

Therefore, there is a recurring theme, occasionally from the industry, but more usually from the leather scientists themselves, that scientific research is necessary for the continued vitality of the industry.

But then, we would say that, wouldn't we?

THE FUTURE

The current status of leather research and leather science research is quite healthy. Output is high and the value is still relatively high: in particular, the contributions from Europe and the USA are still relevant and important. However, some trends are clear.

- Standards in research might be falling rather than rising: other judges might come to a different conclusion. Nevertheless, this is a constant challenge to both the researchers and the publishers/editors of peer refereed journals, which are primary guardians of standards.
- The modern emphasis on numbers of publications to define professional success can have the effect of diminishing the impact of the research on the readership and thence on the industry.
- Research output is shifting from the west to the east, at least in terms of volume: this is an inevitable consequence of the global movement in leather production. However, leather science research remains strong in Europe and in the USA. But for how much longer?
- The level of scientific support to national industries is also shifting from west to east, with consequences for international competitiveness in the longer term.
- In the same way as leather science research is moving away from the west, it might be assumed that leather science education will do the same. Teaching is still strong in UK, where students may still study through bachelor and master's degrees and up to doctorate level at the University of Northampton.
- There is no evidence that education in leather related subjects is currently changing at a fast rate. However, the global industry faces the challenge of supporting the teaching of leather science and technology, to ensure the continuing availability of good teachers in the future.

Contrary to the implications within the bulleted points above, there is no inevitability that leather science in the west will be lost. Although the received wisdom that the leather industry is moving east and south was true of the last couple of decades, the global leather industry is changing and it may no longer be true. The traditional skills and craft in the west are valued by the consumer and, combined with rising labour costs in the far east, the trend is slowing and there are even signs of reversal.[34]

There is no doubt that that much of the global leather industry can survive on leather technology alone. Leather science may be viewed by western industry as a luxury, which it cannot afford, especially in the hard commercial times in which we are currently living. But, in those sectors which rely on niche and high end products and which need constantly supporting by new, exploitable knowledge and understanding, there is the added need for leather science. Also, leather as a commodity must compete with other materials, some of which are offered as a synthetic alternative. Therefore, leather must continue to develop and improve in terms of performance and environmental impact to maintain its markets.

For those reasons, leather science will continue to be needed. The time for a requiem for leather science has not yet come.

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REFERENCES

1. Mayer, M.H; *J. Soc. Leather Technol. Chem.* **79**, 1, 1995.
2. Jackman, J.; *J. Soc. Leather Technol. Chem.* **77**, 35, 1993.
3. Schmel, F; UNIDO, 2009.
4. Wilson, J.A.; The Chemistry of Leather Manufacture, American Chemical Society, USA, 1929.
5. Jordan-Lloyd, D.; Royal Institute of Chemistry, London UK, 1943.
6. Bowes, J.H.; Progress in Leather Science: 1920-45, British Leather Manufacturers' Research Association, London UK, 1948.
7. O'Flaherty, F., Roddy, W.T. and Lollar, R.M.; American Chemical Society, Reinhold, New York, 1958.
8. Sykes, R.L.; *J. Soc. Leather Technol. Chem.* **72**, 1, 1988.
9. Alexander, K.T.W., Covington, A.D. and Walker, M.P.; Proc., IULTCS Congress Melbourne, 1987.
10. Jarrett, R.M and Sykes, R.L.; *J Soc. Leather Technol. Chem.* **72**, 94, 1988.
11. Jeyapalina**,** S., Attenburrow, G.E. and Covington, A.D.; *J. Soc. Leather Technol. Chem.* **91**, 102, 2007.
12. Covington, A.D., Tanning Chemistry. The Science of Leather, Royal Society of Chemistry Publishing, Cambridge UK, 2009.
13. Covington, A.D. *et al*., World Leather, October/November 2010.
14. Covington, A.D.; *J. Soc. Leather Technol. Chem.* **95**, 231, 2011.
15. Pauckner, W., Proc. IULTCS Congress, Venice 1983.
16. Covington, A.D. *et al*., Proc. IULTCS Congress, Friedrichshafen Germany, 1995.
17. Sykes, R.L.; J. Soc. Leather Technol. Chem., **76**, 149, 1992.
18. Brown, E.M. and Qi, P.X.; *JALCA* **97**, 235, 2002.
19. Fennen, J.; *J. Soc. Leather Technol. Chem*., 82, 5, 1998.
20. Siggel, L. and Molnar, F.; *JALCA* **101**, 179, 2006.
21. Jeyapalina**,** S., Attenburrow, G.E. and Covington, A.D.; *J. Soc. Leather Technol. Chem.* **91**, 102, 2007.
22. Lampard, G.S., Leather International, October 2009
23. Jones, B., Redwood, M., Sinturel, P., UNIDO, Leather and Leather Products Panel, Addis Ababa Ethiopia, January 2010.
24. Covington, A.D.; *JALCA* **93**, 168, 1998.
25. Covington, A.D.; *Global Journal of Inorganic Chemistry* **1**, 119, 2010.
26. Blacksmith Institute, November 2011, New York USA.
27. Money, C.A., Leather International, December 2011.
28. Covington, A.D. *et al*., *Polyhedron* **20**, 461, 2001.
29. http://blogs.northampton.ac.uk/mikeredwood/2011/06/16/who-is-tony-covington/
30. Taeger, T.; *JALCA* **91**, 211, 1996.
31. Heidemann, E.; *JALCA* **78**, 250, 1983.
32. Shuttleworth, S.G.; *JALCA* **69**, 360, 1973.
33. Turley, H.G.; *JALCA* **57**, 500, 1962.
34. M. Redwood, personal communication, 2012.

Presentation and Acceptance of the 2012 John Arthur Wilson Memorial Lecture Scroll

by

Michael Bley and Anthony Covington

Anthony Covington Response

Ladies and gentlemen, in comparison with this time last year, I stand before you half the man I used to be – actually 82% of the man I used to be. This is the result of careful eating, less drinking, up to an hour a day on the exercise bicycle and the incentive of a diagnosis of type two diabetes. I recommend the first three life changes, but probably not the fourth.

When ALCA gave me the Alsop Award in 2011, I though it the highest honor I could receive from this organization. However, that might have been superseded by being asked to give the John Arthur Wilson Memorial Lecture for the second time; the first time this has happened. Some two years ago, I announced my retirement from public speaking: only the Procter Memorial Lecture of the SLTC and the John Arthur Wilson Memorial Lecture of the ALCA could tempt me out of alleged retirement!

I feel like some rock band on the last final world tour, which never seems to cease. However, on this occasion, I am determined to finish on a high and call this my last scientific lecture.

Michael Bley presents the Wilson Award.

I have been proud to be an active member of ALCA for 21 years, rather than a mutual member through SLTC, and have always taken a rather perverse delight in paying a premium for the privilege. That will continue, as will my slow progress towards proper retirement. As Dave Bailey once said: 'I may be old enough to take up golf'. That is school governance duties permitting: I am a Governor at the new Daventry University Technical College and Chair of Governors at Lings Primary School in Northampton. Even in semi-retirement I am committed to education at all levels.

You are probably not aware of it, but today is a significant date. I come from the northeast of England, where the inhabitants are known as Geordies – the origin of the term is obscure. We have an anthem, sung on significant occasions, called 'The Blaydon Races'. I will not burden you with a rendition, suffice to say the opening line is: 'I went to Blaydon Races, 'twas on the ninth of June.' In recent years June 9 has been regarded as Geordie Day — so, happy Geordie Day to you all.

Once again, may I thank Stahl USA for their sponsorship and the ALCA for their generosity in honouring me in this way. Thank you very much.

Dr. Covington Accepting Wilson Award

Presentation and Acceptance of the 2012 O'Flaherty Service Award

by

Mainul Haque and Eleanor M. Brown

Mainul Haque

Good Evening Ladies and Gentlemen. It gives me great pride to be here tonight. This year's Fred O'Flaherty Award nominating committee consists of Dr. Bill Marmer, Jeff Miller, and I. It is an honor to have the opportunity to present this award tonight.

Our recipient is a Research Chemist, Lead Scientist of the ERRC. She holds a BA in Mathematics and Chemistry from Ohio Wesleyan University and a Ph.D. from Drexel University in Chemistry with an emphasis on the application of physical chemistry to biological problems. Her research career has been with ERRC, ARS, and USDA. Since 1971, she has studied protein structure in a variety of agriculturally important systems (dairy, poultry, and leather) to achieve knowledge of the relationships between structure and biological or technological function. She has studied the effects of chemical and enzymatic modifications as well as interactions with environmental variables and other biomolecules on protein structure-function relationships in basic and applied contexts. She is author or coauthor of 125 publications and 4 patents and has presented 45 papers at scientific meetings.

Since 1990, she has been Lead Scientist for projects designed to reduce the environmental impact of leather production and develop a basis for understanding the mechanisms of tanning, studies of the relationship between collagen structure and function, particularly in a processing system. As Lead Scientist, she has developed collaborations with researchers in the USA and worldwide for the study of collagen structure and function in tanning and has participated fully in collaborations for the development of value added products from tannery waste. Academic scientists from the USA, UK, China and Spain have obtained their own funding to support their research in her laboratory on the biochemical fundamentals of tanning.

She has been a member of the American Leather Chemists Association since 1991, serving as a member and chair of the Uses of Collagen and its Co products Committee, a member of the Editorial Board of JALCA and a member of Council (2005-2008). She received the prize paper award in 1993 and the Alsop award in 1996. In 2009 she was the John Arthur Wilson Memorial Lecturer for the 105th Annual Meeting of the ALCA. This was the ALCA Prize Paper to be presented at IULTCS. In 2009 at the 30th IULTCS congress in Beijing,

Dr. Eleanor Brown accepts Award O'Flaherty Award from Mainul Haque

China; she has presented the Heidemann lecture on collagen research special lecture "The Collagen Micro fibril Model as a Tool for Leather Scientists". I have attended the congress, this was an epic moment, she presented answer to questions so eloquently, and attending students and teachers from the universities were taking note eagerly, it will be remembered all those were attended.

Her organizational activities in addition to the ALCA include membership in the Protein Society, the American Society for Biochemistry and Molecular Biology, and the American Chemical Society.

It is my great pleasure on behalf of our beloved organization American Leather Chemist Association to present the 2012 Fred O'Flaherty Service award to Dr. Eleanor Brown.

Eleanor M. Brown

Mr. President, Honored Guests and Fellow Members of the American Leather Chemists Association, I am honored and humbled by my selection as the 2012 recipient of the Fred O'Flaherty Service Award. Mainul, I thank you, for your kind introduction. I thank the selection committee Bill Marmer, Mainul Haque, and Jeff Miller.

It is typical when one becomes the recipient of an award such as this to look at the list of previous awardees to see what

general characteristics can be discerned. In looking through the list of prior O'Flaherty Service Award recipients, I was struck by some facts. First, over the past twenty years, the average length of membership in ALCA of an O'Flaherty awardee was 31 ± 10 years, over 600 or service years for 20 members. As a 21-year member of ALCA, I am clearly on the lower end of spectrum. Secondly, beginning in the late 1990's, the awardees are all people whom I know and admire, but with a few exceptions, I know little about earlier awardees. This finding was in stark contrast to the Alsop awardees and John Arthur Wilson Lecturers, most of whom I knew from listening to their presentations or reading their publications. For an organization to succeed in fulfilling its purpose requires the input and support of dedicated members beyond those who stand on the stage and deliver speeches. My analysis of the list of previous awardees leads to the conclusion that the O'Flaherty award honors those who consistently contribute their time and energy to activities, generally behind the scenes, that encourage and support research on problems facing the leather industries, that promote the publication and application of the results of research on topics of importance to the leather and move the organization forward.

I am honored to be included in this group.
Thank you.

June 9, 2012

Presentation and Acceptance of the 2012 Alsop Award

by

Doug Morrison and Nick Latona

Doug Morrison

Nick was born and raised in Milwaukee, WI. He is the oldest of 3 siblings. During his time at the University of Wisconsin-Madison, he was a coxswain on the men's rowing team, a Division 1 varsity sport at Madison, for four years and placed second in the nation at the Intercollegiate Rowing Association championship in the Open Four his senior year. Upon graduating and moving to Philadelphia, Nick coxed at the Vesper boat club on boathouse row, mostly for the men's masters program. Although, he is not involved with rowing anymore, he enjoys working out and exercising on the indoor rowing machine at the ERRC. He enjoys playing golf and tennis when he can. Nick also enjoys watching football and has become an Eagles fan; however he still keeps his Wisconsin roots and wants the Packers to beat the Eagles when they play each other, which makes it interesting when Nick watches the game with Renee's family who are all from Philadelphia.

Nick is married to Renee, who also works at the ERRC. Nick and Renee have two children; Ava who is 5, and Luke who is 3. He enjoys spending time with his wife and kids, especially watching the kids learn and grow. Nick and Renee had their first experience as soccer parents this spring, taking Ava to a soccer camp for 5 Saturday mornings and trying to encourage her to participate and on the last Saturday just trying to get her on the field. Meanwhile, all Luke wants to do is throw, hit, or kick a ball. Their favorite family activities are to go to the zoo, aquarium, or the playground.

Nicholas Latona received his B.S. degree in Materials Science and Engineering from the University of Wisconsin-Madison. After graduating, he was hired by the Eastern Regional Research Center (ERRC) part of USDA's Agricultural Research Service and remains there today as a Materials Engineer. He continues to work under the Research Materials Engineer, Dr. Cheng-Kung (C-K) Liu, with whom Nick has been a coauthor in over 35 scientific publications. Their work during this time has been on such topics as vacuum drying, acoustic emission and currently airborne ultrasonics to nondestructively inspect raw hides and leather. Nick has taken a leading role in adapting airborne ultrasonics technology for studies important to the hides and leather industries. C-K and Nick's scanning electron microscope image of a leather fiber was used as the cover for the Journal of Materials Science in 2001. Also in 2001, Nick passed the Level II General Examination for Acoustic Emission Testing in accordance with recommended practice SNT-TC-1A addressing the basic Physics and Techniques of Acoustic Emission Testing. In 2004, he received the support scientist of the year award at ERRC. For the Federal Excellence in Government Awards program Nick received a bronze medal in 2004 for Private Sector Involvement in a Group, a silver medal in 2009 for Private Sector Involvement in a group, and was a distinguished nominee in 2011 for Outstanding Technical Support Accomplishment. During this time he has served on the Methods and Specifications committee of the ALCA to which he is currently co-chair with Lori Hyllengren. Nick serves on the ASTM International's D31 committee on leather. He previously served as secretary and is now the newly elected chair of the D31 committee, after the previous chair Lori Hyllengren, who did a superb job as chair, had to step down. Nick has been responsible for the audio/visual part of the ALCA conventions since 2001 and continued in this role until 2008; he is again performing this function in 2012.

It is my great pleasure on behalf of our beloved organization American Leather Chemist Association to present the 2012 Alsop Award award to Nick Latona.

Nick Latona

Thank you Doug for the kind introduction. Good evening Mr. President, Mrs. Secretary, members, and guests. I would first like to thank Doug Morrison and the rest of the nominating committee consisting of Lori Hyllengren and Joe Lee for selecting me for this very prestigious award and council for approving it. I would also like to thank Carol Adcock as well and for everything she does to make our society run so efficiently. Thank you to LANXESS Corporation for

Doug Morrison Presents Alsop to Nick Latona

graciously sponsoring the ALSOP award this year, I hope it will continue for many years to come.

I have been very fortunate to have a great supervisor like C-K (Cheng-Kung) Liu, also a past ALSOP winner, who has encouraged me, listened to my opinion, included me as co-author in his papers, allowed me to participate in organizations like the ALCA and to speak at the annual ALCA Research Liaison Committee meeting discussing our research on airborne ultrasonics, which is held every year at the ERRC. C-K's passion for research is contagious, especially when we have our weekly meetings to discuss our current and future work. He has included me in his research by always saying it is our work and to be the first support scientist from the ERRC to receive this prestigious award is truly an honor that I will cherish forever.

When Doug called me and informed me that I was the 2012 ALSOP recipient, I was quite shocked especially considering the relative short time that I have been involved with the ALCA and also considering the accomplishments of the previous recipients, I was wondering if Doug had the wrong number. I can only hope to strive to have such distinguished careers as those before me and it is nice to see many of the previous recipients are still going strong. I am privileged to work with some previous recipients like Ellie Brown, Maryann Taylor, and C-K Liu. We truly have a good team at the ERRC. It is great to know that the ALCA continues to reward research related endeavors. With less and less money going into research, it is nice to come to these meetings and see all of the research being done. For it is through research in not only chemistry but in machinery and the blending of the two as well, like we have seen at this conference, that we can make leaps and bounds in our industry to propel it further and hopefully keep it around for centuries to come.

Lastly I would like to thank my coworker, my best friend, and my wife Renee who always answers my chemistry questions and is always there for me to support me in whatever I do.

Again, thank you for this award; it is an honor to be recognized by my colleagues and friends of the American Leather Chemists Association.

June 9, 2012

Closing Remarks by Past and New ALCA President

by

Andreas Rhein and Steven Gilberg

Andreas Rhein
Good evening Members and Guests. Thank you very much for making this 108th Annual Convention a success.

First I would like to thank my fellow officers, Steve Gilberg and Steve Lange, our Council members, and the technical committee chairs. Also thanks to our 2012 Convention Committee Lee Lehman, Steve Yanek, Steve Gilberg, Nick Latona and Jim Ignatowski, for a job well done. Also thanks to Bob White, our Editor, for your outstanding work; and a very special thank you to the brains behind the ALCA, Carol Adcock, our Executive Secretary.

Over the last two days we have been able to listen to a variety of papers presented by experts from around the world including Managing Chromium in Manufacturing, High Pressure Hide Processing, Biodiesel Out of Fleshings, Hide Market Information, Traceability and Sustainability.

When I was voted into office in 2010, the general reaction within the industry was that I would be out of a job within the first year, just like the most recent officers before me. I had also pledged to promote the activities of the ALCA and grow our membership. Well, I still have my job and we are still adding members. During the last three years, we have enjoyed very successful conventions in Wheeling, WV and Red Wing, MN. During my tenure we have had discussions about our website, promoting our individual committees online, etc. overall with moderate success. During my last year I had made an effort of promoting the ALCA as a "club" to anyone who likes leather in any shape and form. My goal to add members will continue; and based upon the fact that the leather business will remain in the US and perhaps will grow in years to come, everybody involved in the US leather business should be a member of the ALCA. The main purpose of the ALCA should be the development of new contacts, maintaining contacts, building and maintaining friendships.

Starting on Monday, the planning for our 2013 convention in Pinehurst will begin. I would like to welcome Steve Gilberg, Steve Lange and Sarah Drayna as the next generation officers. We will have a successful convention in 2013.

It has been an honor to be the President of the ALCA. Thank you very much for the opportunity.

President Steve Gilberg accepts gavel from past president Andreas Rhein

Steve Gilberg
Ladies and gentleman, it is an honor and a privilege to stand here tonight in this spot and this occasion to accept the responsibilities as your President.

The ALCA has always been about Research and fellowship for its Members As President, my focus will be,

- The Annual meeting
- The Correspondence Course
- Attract new members
- and The Journal

Those four goals have kept this group cohesive and vital for 107 years, and will continue so for as long as American Leather chemists and technologists have a need to belong to a professional group beyond their employer. In the coming year, we need your ideas and enthusiasm as we plan and carryout this task. I am looking forward to working with you, the council and members to achieve these goals!

Thank you for your attendance this year and enjoy the rest of the evening.

Meeting adjourned.
9.9.12