Farewell Message from TAGA President Bruce Blom

TAGA 2003 Montréal—A Huge Success!

As my final contribution to the newsletter I am delighted to report that our Annual Technical Conference, just completed in Montréal, was a tremendous success. Total attendance was 264, a 30% increase over last year’s attendance in Asheville. Amazing considering the war, the SARS scare, and the wretched weather in the Northeast over the conference dates. We can thank the outstanding efforts of our Program Chairman, Dr. Richard Goodman, our TAGA staff, Karen Lawrence and Kara Knopf, and our local organizers, André Dion and his associates, along with Hans Heintz for making this all possible.

Those of you who attended the conference also had an opportunity to see the printed version of the Journal of Graphic Technology. It was beautiful! My thanks go out to André Dion and the Quebec Institute of Graphic Communications for the printing. My heartfelt thanks also go to Dr. Juanita Parris of Sun Chemical Corp. for the outstanding job she has done in pulling this project together. The on-line version of the Journal is available to all members and the printed version can be ordered separately—details are available on the web site. Look forward for additional promotional information.

It has been an honor to serve as TAGA president these past two years. Without the support and contributions of the TAGA staff and Board it would have been an overwhelming challenge. I would particularly like to thank my fellow members of the Executives Committee: Messrs. Ray, Goodman, Stanton and Ingram, for their collaboration as we worked our way through some difficult financial and organizational issues. We are not “out of the woods” yet but I believe we see a viable solution to the challenges. I know Bill Ray, our new President, and the Board have made this their priority.

I urge prospective authors to contribute to the Journal. Based on the quality of papers published and soon to be published, I know you’ll be in good company as the Journal becomes the premier publication for graphics arts scientists and engineers. Please be sure to let your colleagues know of the availability of the Journal as well—it comes free with membership!

I look forward to seeing you in San Antonio next year!
In addition to a special Featured Article by Prof. Dr. Helmut Kipphan, Senior Vice President Technology & Innovation Research, Heidelberger Druckmaschinen, Germany, the following peer reviewed papers will appear in the next issue of the TAGA Journal of Graphic Technology:

- **Printing Methods for Flat-Panel Display Manufacturing**
  Eran Elizur and Dan Gelbart, Creo Inc

- **Ink Gloss Development Mechanisms After Printing—Part 1: The Influence of Ink Film Thickness**
  Dr. J.S. Preston, Mr. D.J. Parsons, Dr. J.C. Husband, and Dr. A. Legrix, IMERYS Minerals Ltd.; Mr. M. Jones, University of Wales, Swansea

- **Interaction Between Water and Paperboard and Liner in a Flexographic Printing Press**
  Johanna Johnson, Karlstad University, Karlstad, Sweden; Magnus Lestelius, Karlstad University, Karlstad and BrobyGrafiska Education, Sunne, Sweden; Peter Råttö, Karlstad University, Karlstad, Sweden; Erik Blohm, Swedish Pulp and Paper Research Institute (STFI) AB, Stockholm, Sweden; Lars Järnström, Karlstad University, Karlstad, Sweden

- **Single Fluid Inks: A Literature Review**
  Grant T. Shouldice and Richard R. Durand, Jr., Sun Chemical

- **Influence of Latex—Oil Interactions on Offset Ink Setting and Component Distribution on Coated Paper**
  Dr. Sanna Rousu, M.Sc., StoraEnso Fine Paper, Finland and Åbo Akademy University, Finland; Marika Lindström, StoraEnso, UK and Åbo Akademy University, Finland; Dr. Patrick Gane, Omya AG, Switzerland; Dr. Andreas Pfau, Dr. Volker Schädler, and Dr. Thomas Wirth, BASF AG, Germany; and Prof. Dan Eklund, Åbo Akademy University, Finland

- **Evaluating Systematic Print Mottle**
  Carl-Magnus Fahlcrantz: STFI, Swedish Pulp and Paper Research Institute

The Journal of Graphic Technology, Volume 1, No. 1, is now also available in print.

Subscription Prices: Members – $99/year for 4 printed issues; Non-Members – $165/year for 4 issues (printed version only); Single issue – $49/copy

See www.taga.org for ordering information.

To view the full abstracts, please go to www.taga.org.
For his 34 years of dedicated services to computer graphic technologies starting with innovative prototypes using primitive technologies of the early 1970’s; advancing to the Typlan Company that produced typesetting and editorial systems and research on computer-aided page make-up at Brown University; for his three years as Research Director with IFRA that led to large-scale research on newspaper prepress technology; and for his research from prepress paginations to production management in graphic arts and interactive digital media, TAGA honors Nils Enlund.

Nils Enlund was born in Jakobstad, Finland, in 1946. He never intended to involve himself in the graphic arts beyond avid reading of newspapers and literature. He studied philosophy and psychology at Helsinki University as well as electronics engineering at the Helsinki University of Technology. A year at Lafayette College, Easton, PA, where he received a Bachelor of Science in Electrical Engineering in 1969, awakened his interest in information technology and computer science.

Returning to Finland, Nils found himself accidentally involved in a groundbreaking research project at the Helsinki University of Technology, the Computer Graphics Project, attempting to achieve interactive page make-up of newspaper pages using the primitive computer technology of the early 1970's. In addition to delaying his academic career for several years, the project sparked his lifelong interest in the application of computers to graphic arts and media production.

The Computer Graphics Project produced, in addition to a number of innovative prototypes, a spin-off company, Typlan, that produced typesetting and editorial systems mainly for the Scandinavian market. A cofounder of Typlan, Nils served as systems designer and development manager between 1972 and 1980. His research into computer-aided page make-up continued in the BUNPAPS project at Brown University, Providence, RI, in 1973–74.

At the Helsinki University of Technology, Nils Enlund obtained his Master of Science degree in Electronics in 1974 and the degree of Licentiate of Technology in Information Processing Science in 1977 with a thesis on electronic newspaper archives. He also served in different teaching and research positions at the Helsinki University of Technology.

In 1980, Nils became Research Director of IFRA, the international newspaper technology research association in Darmstadt, Germany. At IFRA, he was mainly involved in research concerning newsprint, rotary press printing, prepress technologies, and emerging electronic news media. In late 1983, he returned to Finland to manage a large scale research project, financed jointly by the eight leading Finnish newspaper publishers, to investigate and develop future newspaper prepress technology. In 1987, he became president of a consulting company spun off from this research project.

In 1985, Nils Enlund started on a return path to Academia, taking up a position as professor of text and image processing at the Royal Institute of Technology (KTH) in Stockholm, Sweden. There, he became responsible for building up a new undergraduate and graduate education in graphic arts technology. In 1991, he received the academic degree of Docent at KTH.
Announcing the TAGA 2003 MONTRÉAL STUDENT CHAPTER NEWS

Dr. Bernard Pineaux, E.F.P.G. (left) with Nick Doyle, RIT (right)

Dr. Bernard Pineaux, E.F.P.G. (left) with Marie Effler, E.F.P.G., France (right)

Dr. Bernard Pineaux, E.F.P.G. (left) with Eric Stone, Clemson University (right)

Marie Effler, E.F.P.G, France (left) with Dr. Bernard Pineaux, E.F.P.G. (right)

Laurie Chastanet, E.F.P.G, France (left) with Dr. Bernard Pineaux, E.F.P.G. (right)

Dr. Bernard Pineaux, E.F.P.G. (left) with Andrea Frimova, Western Michigan University (right)

Congratulations, TAGA!
At the TAGA 2003 Awards Banquet in Montreal, TAGA Student Chapters and Education Committee Chair, Dr. Bernard Pineaux of E.F.P.G. (France) presented the following awards to TAGA Students:

**OVERALL QUALITY OF THE STUDENT PUBLICATION**

1st Place
Rochester Institute of Technology

2nd Place
Clemson University

**HONORABLE MENTION STUDENT PUBLICATION**

Cal Poly State University

**OVERALL PRODUCTION QUALITY OF THE STUDENT PUBLICATION**

Rochester Institute of Technology

**OVERALL QUALITY OF THE TECHNICAL WRITING IN THE STUDENT PUBLICATION**

E.F.P.G., France

**OVERALL QUALITY NON-PRINT STUDENT PUBLICATION**

Clemson University

**POSTER PAPER AWARD**

Laurie Chastanet, E.F.P.G., France

**HARVEY R. LEVENSON/TAGA UNDERGRADUATE STUDENT PAPER AWARD**

Dustin LeFebvre
Western Michigan University

**DUSTY RHODES/TAGA GRADUATE STUDENT PAPER AWARD**

Andrea Frimova
Western Michigan University

To join, go to www.davesforums.com, which is a PrintPlanet site for E-Community forum incubation, and follow the directions.
THE ORIGINAL COLOR CORRECTION MEANING

It is not unreasonable to think that the term “color correction” may refer to an error: something that had once been done incorrectly that now has to be redone or corrected. In fact, the term has never had this meaning. The original meaning referred to the adjustment of color separations in order to compensate for the unwanted spectral absorptions of printing ink pigments. Today, however, the meaning of “color correction” is usually expressed succinctly, if somewhat inappropriately, by the phrase “getting the color right”.

The original meaning of color correction is derived from the fact that ink pigment spectral absorption characteristics deviate from their theoretical ideal. Actual magenta pigments, for example, absorb too much blue light; therefore, if simple red, green and blue filter color separations are made and subsequently printed, insufficient blue light will be reflected wherever magenta prints.

It is not possible to increase the blue light reflection of a given magenta pigment, but it is possible to increase the blue light reflection of the printed image by reducing yellow wherever magenta prints. Yellow pigments absorb blue light; therefore, the unwanted blue light absorption of magenta is “corrected” by modifying the yellow color separation. The correction can go only so far: once the halftone dot value of yellow in a particular area reaches zero, no further increase in blue light reflection is possible.

In time, the term “color correction” was being used to describe most of the modifications that were made to the color separation files, films, plates or other image carriers. Such adjustments were made not just for dot gain and similar process-related reasons, but were also driven by imperfections in the originals and the customers’ business purpose or creative vision. The following sections describe the three broad types of image adjustments that usually fall under the color correction heading.

PROCESS COMPENSATION

The original meaning of the term color correction started passing into history when the first lookup table (LUT)-based color scanning systems were introduced. The LUT was used to “find” the CMYK halftone output printed combinations that produced the same colorimetric values as the input RGB filter readings for a given point. In essence, the spectral absorption characteristics of the inks, the press dot gain and ink trap performance, and the influence of the substrate are all built into the paired LUT locations containing a given set of RGB values and the CMYK percentages that produce a colorimetric match.

It is the process compensation aspect of color correction that, in theory, is handled by today’s color management systems. The ink-paper-press colorimetric behavior is incorporated into the output profile, and the interaction between the original colorants and the scanner’s electro-optical system is incorporated into the input profile. The profile connection space is used to convert input colorimetric values into halftone dot values that will, when printed, produce the same colorimetric values as output.

IMAGE COMPROMISES

The conversion of input colorimetric values into matching output colorimetric values rarely happens in practice because the input values often exceed those available from the output media. In such cases the image must be “corrected” or adjusted to produce the best possible result within the gamut constraints of the printing system.

Typically, the tone scale of the original is compressed in a nonlinear fashion to emphasize the tonal separation in the region of the image identified as the “interest area”. The interest area is the most important tonal region of the image (e.g., the hair in a shampoo advertisement).

The saturation dimension is usually treated in a manner somewhat similar to that used for tone compression; i.e., the normally-preferred compression preserves the perceptual relationship between the saturation levels of a particular hue, even though they are degraded relative to the original. In some cases, however, this perceptual relationship may be sacrificed in order to preferentially reproduce a particular saturation that may have a special significance (e.g. a product color) to the image.

An automated color correction process known as “gamut mapping” attempts to compress both tonal and saturation values to produce the best possible results. Such algorithms may produce quite satisfactory results for some images or some markets, but generally will not be good enough to satisfy the demanding requirements that are brought to bear by customers during the graphic arts color approval process.

CUSTOMER ADJUSTMENTS

The types of color corrections that have always been with us are those specified by the customer. The objective is always the same: change the image to make it “better”.

If the original image is improperly exposed, has an objectionable color cast, or inaccurately represents a product or other important color, a customer will specify that the reproduction colors and tones be corrected. Product samples, neutral gray scales and other guides will provide reasonable guidance to the color corrector for these straightforward kinds of customer corrections.

The difficult kinds of customer-requested adjustments are those that are designed to enhance the appearance of an otherwise reasonable image. Artists and designers use color to create a sense of movement, the illusion of three dimensions and a strong visual impact. Such are often the objectives of art directors, graphic designers and print buyers that are brought to bear during the proof correction process. The deliberate graying of some image colors, for example, can make adjacent colors appear more vibrant. These adjustments are difficult to articulate in advance because the impact of a given image printed with a given ink-paper combination is difficult to previsualize.

Another effect that is difficult to previsualize is how the juxtaposition of images, type and graphic elements within a layout will influence the overall perception of the combination. Corrections for these “field of view” effects require uniquely human judgments that often become apparent only late in the production process.
Dr. William Ray, President of Group InfoTech, has been elected as TAGA President.

Dr. Richard Goodman of Kodak Polychrome Graphics has been elected as TAGA Executive Vice President.

Dr. Tony Stanton of Carnegie Mellon University and former TAGA Secretary-Treasurer, was appointed to serve the remainder of Dr. Goodman’s term as TAGA Vice President of Technical Papers. Tony will be responsible for the selection of papers presented at TAGA’s conferences and for the overall agenda of the TAGA annual conference.

Dr. Tim Claypole of the University of Wales Swansea was appointed as TAGA Secretary-Treasurer serving for one year to fill the vacancy created by Dr. Stanton’s appointment.

Dr. Sam Ingram of Clemson University continues to serve as TAGA Vice President of Membership/Publicity.

Dr. Bruce Blom of MeadWestvaco will move into the Immediate Past President’s position serving as chairs for both the Nominating Committee and the corporate sponsorship effort.

Dr. Ed Granger of Ontario Beach Systems was elected to serve a second term as a TAGA Board Director. Also elected to Board of Directors positions were Anne Blayo of EFPG (France), William Esler of Quoin Communications, Helene Juhola of VTT (Finland), and Bjorn Kruse of Linkoping University (Sweden). Dr. Claypole’s appointment to a TAGA Board officer’s position created a vacancy on TAGA’s board of directors and Eric Neumann of Fuji Photo Film was appointed to fill that vacancy.

Having fulfilled their terms, leaving the board are Dr. Richard Holub of IMAGICOLOR and John Werner of Green Sheet Communications. Many thanks to both for their years of dedicated service to TAGA.

TAGA Honors Award

In 1994, he was appointed professor (chair) of graphic arts technology at KTH where he is currently responsible for research, postgraduate education and undergraduate education in media technology. Since 2001, he is also academically responsible for the M.Sc. program in electronic publishing and multimedia technology at Gjoevik College in Norway. He is also a visiting professor at the University of Zagreb, Croatia. Nils has so far supervised 12 doctoral, 11 licentiate, and more than 300 master theses in media technology and graphic arts, trying to satisfy the growing need for scientists and engineers in Scandinavian media companies.

Nils Enlund’s own research interests have evolved from prepress technology and interactive pagination to production management in graphic arts and interactive digital media. He is also one of the originators of the IFRAtrack standard for production management. He has authored or co-authored almost 200 scientific and technical publications.

Nils Enlund is fluent in Swedish, English, Finnish, and also speaks some German. Thus far in his very full career, Nils has earned four academic degrees, has had 15 main employments, 31 Positions of Trust and secondary employments, 13 scientific Advisory, Editorial and Review assignments, four Honorary Memberships and Awards, 17 Expert assignments, and has been engaged in 23 postgraduate academic thesis supervisions.

Nils attended his first TAGA conference in 1974. He is a board member of IARIGAI (International Association of Research Organisations for the Printing, Information and Communication Industries) as well as of several research organizations and commercial companies. His private interests (it is amazing he has time for private interests) include literature and music, especially opera.

For his efforts in prepress technology, interactive pagination and digital media, at the Honors Award Banquet at its 55th Annual Technical Conference in Montréal, TAGA distinguished Nils Enlund with the 2003 TAGA Honors Award. At Nils’ request, the award was presented by TAGA Board of Directors member, John Werner of Green Sheet Communications.

Congratulations, Nils!

Color Correction Concepts

The compensatory hue shifts that are sometimes inspired by tone and saturation compressions, and the color adjustments that are prompted by image sharpening and other image structure refinements, are also difficult to previsualize. The use of textured substrates or overprint varnishes or coatings add yet further uncertainties to the process of color image perception. Customer-driven color correction, therefore, will likely remain more of an art than a science.

IMPLEMENTING COLOR CORRECTION

If process-related compensations can indeed be successfully handled by color management systems, then image compromise decisions and customer-driven adjustments are those other “correction” activities that remain in the realm of the color corrector. Most of these corrections or adjustments are achieved by manipulating tone and saturation compression curves while the image is in digital form.

Color correction is a dynamic process that is difficult to verify without using an iterative proofing process. Color monitors can help, but only up to a point. The elusive art of color quality refinement and the techniques of color correction will be further explored in future columns.

FOR FURTHER INFORMATION

Field, Gary G., TAGA Newsletter “Color Concepts” columns: Tone Reproduction (issue 133), Color Saturation (issue 139), and Predicting Color Reproduction (issue 121). These articles are available at the Members Only section of the TAGA website (www.taga.org) and in Color Essentials, Graphic Arts Technical Foundation, Pittsburgh, Pennsylvania (2001).

ABOUT THE AUTHOR

Gary G. Field is an Imaging Scientist and Professor at the California Polytechnic State University.
2003 TAGA TECHNOLOGY PATRONS

Membership Level Criteria:
Contributions with total value of $5,000 or more in goods/services/cash to TAGA in 2002–03
BF&D/Favat & Associates
Group InfoTech
Printable Technologies Inc.
Quebec Institute of Graphic Communications (IGCQ)

2003 TAGA CORPORATE SPONSORS

Membership Level Criteria:
Annual member dues of $1,000

Agfa Corp.
American Color Graphics
Appleton Coated, LLC
Baldwin Technology Co., Inc.
Creo
Enfocus Software, Inc.
Flint Ink
Fuji Photo Film USA
Group InfoTech, Inc.
Hallmark Cards, Inc.
Heidelberg Web Systems
INX International Ink Co., Inc.
Kodak Polychrome Graphics
MacDermid Graphic Arts SAS
Sun Chemical Corp.
Toppan Printing Co., Ltd.
Yamatoya & Co., Ltd.

Sign up now to sponsor an event at TAGA ’04 San Antonio!
To sign up, send an e-mail to TAGAOfc@aol.com.

TAGA 2003 Montréal

MeadWestvaco

YAMATOYA & CO., LTD.
Ontario Beach Systems • ROYGBIV

TAGA BOARD OF DIRECTORS

2002–03

OFFICERS

President
Bruce Blom, Mead Corp.
Executive Vice President
William Ray, Group InfoTech, Inc.
Vice President Technical Papers
Richard Goodman, Kodak Polychrome Graphics
Vice President Membership/Publicity
Sam Ingram, Clemson University
Secretary-Treasurer
Anthony Stanton, Carnegie Mellon University

BOARD OF DIRECTORS

Tim Claypole, University of Wales-Swansea
Charles Gehman, Print Cafe
Ed Granger, Ontario Beach Systems
Paula Gurnee, Ink Systems, Inc.
Helene Juhola, VTT
Leigh Kimmelman, Group InfoTech
Bjorn Kruse, Linkoping University
Stig Nordqvist, Swedish Newspaper Publ. Assn.
Bernard Pineaux, EFG
David Romano, Agfa Corp.
John Werner, Green Sheet Communications, Inc.

IMMEDIATE PAST PRESIDENT
Richard Holub, IMAGICOLOR

STAFF
Karen E. Lawrence, Managing Director
Kara L. Knopf, Assistant to the Director
Michael H. Bruno, Executive Director Emeritus

Copyright, 2003 Technical Association of the Graphic Arts