CHAIRMAN'S CORNER

As my term as your chairman draws to a close, I'd like to take this opportunity to look back at some of the achievements of our Division in the past year.

Our principal reason for existence is education, and I feel we have done a good job this past year. The Division programs at both ANTEC and RETEC were well attended with excellent papers presented at those functions. The Technical Program Committee is working now to develop programs for the future. Joint RETECs will be given in 1991 and 1993. This fall, in conjunction with the Thermoplastics and Foam Division, our RETEC will be held in New Orleans.

A joint RETEC allows us to get our message to people outside the color discipline, and gives us the opportunity to learn about color problems from a different perspective.

Our Color Seminar, given a few times a year by either Bob Charvat or Rick Mathew, has been enhanced with the addition of a portable Macbeth light booth.

The support of CAD has allowed the Color Technology Program at Terra Technical College to continue to grow. We look forward to the first graduates entering the job market in May. We are also considering the establishment of similar courses at other technical colleges in the country.

Division contributions to SPE's student travel fund have enabled student participation at ANTEC. The enthusiasm of students at ANTEC is indeed an exciting thing to experience.

After several years of being unable to participate as a member body of the Inter Society Color Council, CAD was able, following a revision of ISCC's Constitution and By-laws, to rejoin this prestigious group.

We continue to provide speakers to sections requesting them. If any CAD member would like to serve as a speaker, contact Jack Graff at (412) 777-7883. We need speakers for almost any color related subject.

The programs mentioned above are made possible by volunteers like you and me. The pay and hours are outstanding, but even more important, the personal satisfaction is abundant. Each year new members are needed for both the Board of Directors and the Technical Program Committee. If you have the interest and the support of your company, consider serving. You will get much more than you give. Call me at the Ambacent R & D Center, (812) 466-9828 if you are interested.

DON DEEM

Montreal has earned an international reputation based on the success of EXPO 67, the 1976 Olympics, the International Jazz Festival, the World Film Festival, the Just for Laughs Comedy Festival and the Montreal Symphony Orchestra. Further, Montreal is the headquarters for many Canadian and International companies and organizations. The architecture of the city incorporates both modern and old designs. Examples of this include the subway system and La Maison Alcan, headquarters for Alcan Aluminum, which incorporates an old hotel and Victorian houses into a modern office building. The three areas of prime interest to tourists are Old Montreal, downtown and the French neighbourhoods of St-Louis and Mont Royal.

Tentative Program
ANTEC 1991
Color and Appearance Division
Wednesday, May 8, 1991

Time  Speaker/Company  Paper
9:30 a.m.  G.W. Tarbet  Pigments in Plastic Food Contact Packaging:
Health and Welfare Canada  Canadian Health Safety Evaluation
10:00 a.m.  B.J. Meldrum  Fine Particle Titanium Dioxide:
Tioxide UK Ltd.  A Brief Introduction
10:30 a.m.  R.L. Abrams  Liquid Color: Worth Considering
Ferro Corporation  Again
11:00 a.m.  K. Hattori  New High Loaded White
1st and S. Morford  Concentrates
Polycom Huntsman Inc.
11:30 a.m.  R. Popli, D.H. Mauer and  Carrier Resin for a Multi-Purpose Solid
D.E. Wittenhafer  Color Concentrate
S.C. Johnson and Son, Inc.
2:00 p.m.  D.A. Holtzen  Discoloration of Pigmented Polylefinas:
Du Pont Chemicals  A Review and New Directions
2:30 p.m.  A.H. Reid and D.A. Holtzen  Studies of the Use of Dibasic Organic Acids
Du Pont Chemicals  for the Deactivation of Pigment Induced
3:00 p.m.  H.P. Schreiber, S. deRong  Discoloration in Polymer Systems
Ecole Polytechnique and  Impact Properties of Rutile Filled
A. Haber  Thermoplastics
Tioxide Inc.
3:30 p.m.  M.P. Sepe  An Evaluation of a Cadmium Free Red
Dickten & Masch Mfg. Co.  Pigment System in Nylon
4:00 p.m.  J. Deak  The Color Measurement and Color Formu-
ACS Datacolor lation of Plastic Surfaces which Differ in
Specular Reflectance
4:30 p.m.  Color and Appearance Division Business Meeting

*Speaker

Board Meeting Highlights

Your CAD board and TPC winter meeting was held at the New Orleans Marriott to preview the site of RETEC 1991.

The TPC first reported on our upcoming technical conference following the board meeting.

Treasurer—John Hackman—The division is in fine shape with a $48,777.66 balance prior to posting the RETEC 1990 receipts.

Awards—Frank Fasano—Best Paper Awards will be presented at ANTEC. Zack Fisackerly received the outstanding achievement award.

Council Division—Bob Charvat—Next meeting is March 7-8, 1991. Bob Charvat will retire as councilor effective ANTEC. Thanks to Bob for his many years service.

Membership—Jack MacMillan—We are ahead of our goal of 10% growth for the pride criteria.

Rules and Elections—John Copp—The second half of the proposed rules were presented and passed. We have a full slate assembled for the upcoming elections.

Education—Tim Lewis—A survey will be included with the election mailing to canvass the general membership for future education goals for the division.

For more details I refer the reader to each officer or chairman’s section elsewhere in this issue.

BRIAN S. WEST, Secretary

Color and Appearance Division

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Past Chairman ............ John Copp
Dow Chemical Co., (517) 636-9281

COMMITTEE CHAIRMAN

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Education ................ Timothy Lewis
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Newsletter ............... John Graf
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Technical Program .... Regina Wojciechowicz
PDI Colorants and Additives
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Ron Harris
PMS Consolidated, (305) 752-7722
Tim Lewis
PMS Consolidated, (419) 668-4844
Color and Appearance Division
TREASURER'S REPORT

Beginning Balance (10/9/90) $52,072.45

A. Receipts
   1. Division Investment Plan
      September Interest 323.51
      October Interest 339.29
      November Interest 329.30
      December Interest 345.29
      $1,337.39
   2. Newsletter Sponsor Donations
      Colortronics 150.00
      $1,487.39

B. Disbursements
   1. Jack Graff (Newsletter, Mailing) 241.27
   2. Jack Graff (Newsletter, Printing) 1,656.78
   3. Mobay Corporation (Newsletter, Postage) 646.20
   4. David Bryan (Student Paper, Expenses) 516.27
   5. Macbeth (Portable Lightbooth) 1,486.19
   6. SPE (Envelopes) 27.07
   7. Court of Two Sisters (Dinner Deposit) 200.00
   8. Bank Service Charges (September-December) 8.50
      $4,782.28

Current Balance (1/22/91) $48,777.56
Checking Balance 2,432.71
Division Investment Plan Balance 46,344.85

JOHN R. HACKMAN, Treasurer

Color and Appearance Division
Council and Division Committee
WINTER REPORT
Robert A. Charvat

The next SPE council meeting will be in early March. Until that meeting, there is nothing to report that has not already appeared in our Newsletter.

There are some additional items to pass along. This will be my last report as your Council/Division Committee Chairman. I will retire from these positions at ANTEC in Montreal. Has it been a pleasure to represent CAD? You bet it has! I have enjoyed every minute and hope my contributions to CAD as your Councilman has enhanced our Division. I have been proud of our growth and stature which is the result of many contributions more extensive than mine.

Will I fade away? Not on your life! As a charter member of CAD, I fully expect to maintain an active presence. In the meantime, thanks to all for your support.

The CAD Color Science Seminar Series is progressing nicely. Rick Mathew and I will present the seminar to our members four to six times per year with attendance ranging from six to thirty people. The current material is a beginning type one-day course. Hopefully, this material will be updated and improved sometime this year. Additionally, we are discussing the possibilities of an advanced course which would get into subjects of interest in much more detail. With a little luck, Rick and I will get it done.

The Macbeth booth we use in the course which CAD provided has been a wonderful improvement and contributes significantly to the course presentation. If any reader out there has any outrageous metameric pairs they could contribute to our “show and tell” we would appreciate your contribution.

Finally, the next elected Council person to represent CAD will have an interesting and hopefully productive term in office. CAD and SPE will face many challenges in the next few years. CAD is not the largest Division within SPE, however, we have been and will continue to be one of the most progressive and productive divisions in the SPE group. This position of stature within SPE is a result of many hard working committed CAD people. Your support of our Division officers and committees is appreciated and counted on in the future.

C.A.D. People

The purpose of this column is to keep you informed of the activities of your friends and acquaintances in the Color and Appearance Division. If you have any good news of a colleague, please forward the information to the editor or to John Copp of the Dow Chemical Company (517-636-9281).

Dennis Meade formerly of Ferro Corporation, has started a new concentrate and compounding business called Phoenix Color and Compounding in Sandusky, Ohio.

Theresa Martinell McGuckin of Rohm & Haas Company, who gave an excellent paper at the 1990 RETECC was married shortly after the RETECC.

Al Rowder of BASF was also married recently to a lovely California lady, but we doubt that his story about year round surfing on Lake Michigan will prove to be true.

Frank Fasano of Hoechst-Celanese has announced his engagement to Carolyn Pari. They plan to be married in March and an ANTEC honeymoon is planned for Montreal. (Unpaid plug for ANTEC).

Randy Elinski of Reed Plastics has proudly announced the birth of a baby daughter. In another unrelated occurrence Sara Yockey of Reed Plastics also gave birth to a daughter.

Pam Gardner formerly of Quantum Chemicals has accepted a position in the Technical Service Group of G.E. Specialty Chemicals in Parkersburg, West Virginia. Pam is still looking for some papers for the 1991 RETECC (New Orleans). George Oley formerly of G.E. and Ametek has accepted a position as Color Laboratory Supervisor at D.H. Compounding (Dow-Hanna) in beautiful central Tennessee.

John Huffman another G.E.-Borg alumnus has also accepted a position as Quality Control Laboratory Supervisor at D.H. Compounding.

CAD elections ballots will be coming to you soon. Running for Technical Program Committee will be:

Sharon Ehr—Chroma Corporation
Gordon Gavin—Monsanto
Bruce Mulholland—Hoechst-Celanese
Russ Steinle—X-Rite
Paul Szelwagyi—PMS
Bob Zeller—Akzo

The Board of Directors candidates are:
Bob Charvat—Englehard
Ted Doering—Morton Int.
Terry Golding—Spectrum Colors
Bill Jarrett—Kerr-McGee
Rudy Groot—Holland Colors
Jack MacMillan—I.C.I.
Harry Sarvis—Ferro
Craig Weardon—Polyolve

In addition John Copp of Dow, Ron Harris of PMS and Bruce Muller of Accurate Color are running for Council Representative.

PLEASE VOTE!
THE ESSENCE OF PIGMENT
By JOHN GUZI, Jr.
CIBA-GEIGY CORPORATION—PIGMENTS DIVISION
JAMES & WATER STREETS
NEWPORT, DELAWARE 19804

INTRODUCTION
Webster's Dictionary defines color as "a phenomenon of light or visual perception that enables one to differentiate otherwise identical objects." The important properties of colorants, therefore, relate to their ability to absorb visible light. Colorants can be differentiated into the more familiar terms, pigments and dyes, which in turn can be distinguished because pigments, unlike dyes, are practically insoluble in the medium in which they are dispersed.

The color of a pigment, whether organic or inorganic, is therefore the direct result of its ability to absorb light which in turn is closely related to its chemical structure, particle morphology, and system or environment. This paper will take a closer look at chemical structure—property relationships, as well as the particles of organic pigment.

PIGMENT MANUFACTURE
A brief view of the manufacture of an organic pigment is very relevant to a discussion of pigment particles. The flow sheet in Figure 1 depicts the process for typical disazo condensation pigment. One mol of a diazine such as 1,4-diamino-2,5-dichlorobenzene is added to a solution of two mols of an azo carboxylic acid halide in o-dichlorobenzene. The process is quite a bit more complex than the flow sheet indicates because several coupling steps are required to produce the monoazo carboxylic acid chloride. The pigment suspension that forms is immediately stirred at 140-150°C for 6-10 hours. The suspension is then filtered and washed successively with o-dichlorobenzene, an alcohol, and water. The washed pigment is then dried at 120-140°C and ground to a fine, uniform powder. Note on the flow sheet that pigment crystals are formed in the reactor, and that pigment aggregates and agglomerates are formed in the subsequent processing steps of filtration, drying, and grinding.

PIGMENT PARTICLES
Well-crystallized, industrially manufactured organic pigments consist of the following building units as represented by Honigmann and Stabenow [1]: crystallites, crystals, aggregates, and agglomerates. As Figure 2 illustrates, crystallites do not appear as separate particles and should therefore be considered as coherent lattice parts of crystals. Crystals are compact crystalline particles with a shape (rod, brick, cube) usually built from several crystallites. Aggregates are compact particles formed from crystals in a relatively regular, parallel way with connecting surfaces. Agglomerates are particle assembles consisting of crystals and aggregates loosely attached in an irregular way at edges and corners. The Particles of Organic Pigments (After Honigmann [1])

At the moment of formation from lattice parts in a relatively dilute medium, pigment crystals represent what can be termed the ultimate particle of a pigment. Isolation of such particles, although desirable, would be impractical since the form would be smokelike. It is during the isolation steps by filtration, where crystals are concentrated, and especially during drying and grinding, where crystals may be cemented together by sintering or residues from manufacture, that much undesirable aggregation/aggloregation can occur. Pigment manufacturers are not the only culprits, however, because aggregation resulting from compression occurs quite often during processing into an application medium. Regardless of where or how it occurs, aggregation has severe consequences for pigment performance and therefore is a major problem in pigment technology.

PARTICLE DIMENSIONS
Figure 3 summarizes typical particle dimensions. For most organic pigments, the color determining particles range in size from roughly 0.05 to 0.4 μm. Crystals tend to be less than one-half (0.02 μm) and agglomerates roughly twice that size (0.8 μm) or larger. Typically, the particles of a well-dispersed organic pigment are primarily small crystalline aggregates that have been formed from only a small number of individual crystals. The percentage of highly desirable, individual crystals is usually not high.

Much larger aggregates, up to an arbitrary 50 μm, or dry agglomerates up to an arbitrary 2,000 μm, might expect to be found in a container of dry pigment as purchased from a pigment supplier.

Typical Particle Dimensions

Pigment Particles (Dispersed)

<table>
<thead>
<tr>
<th>Crystals</th>
<th>Aggregates</th>
<th>Agglomerates</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.01-0.5 μm</td>
<td>0.05-50 μm</td>
<td>0.1-2000 μm</td>
</tr>
</tbody>
</table>

FIGURE 3
SPE CONFERENCE SCHEDULE

“RECYCLING ’91”

PLASTICS RECYCLING

SECOND EUROPEAN TECHNICAL SYMPOSIUM ON POLYMIDES AND HIGH TEMPERATURE POLYMERS

MEDICAL PLASTICS IN THE 90's, A DECADE OF PROMISE AND CHALLENGE

OLYMPIAN PROGRESS IN BLOW MOLDING
Oct. 7-9, 1991, co-sponsored by the SPE Southern Section and the Blow Molding Division, Hyatt Raven Hotel, Atlanta, Georgia. Contact Len Loudin, BF Goodrich, 8885 Willowbrae Lane, Roswell, GA 30076, (404) 594-1807.

APPLYING TECHNOLOGY TO VINYL: OPPORTUNITIES FOR THE 90's

COLOR AND APPEARANCE OF THERMOPLASTICS FILMS
Oct. 16-17, 1991, co-sponsored by the SPE Color and Appearance and the Thermoplastic Materials and Foams Division, Marriott Hotel, New Orleans, Louisiana. Contact Thomas R. Pfeiffer, Ampacet Corp., 3801 N. Fruittidge Avenue, Terre Haute, IN 47804, (812) 466-9828, Fax (812) 466-6796.

INSERT, MULTIPLE-SHOT AND CO-INJECTION MOLDING

PHOTOPOLYMERS: PRINCIPLES, PROCESSES AND MATERIALS

POLYMIDES: SYNTHESIS, CHARACTERIZATION AND APPLICATION

PLASTICS IN ELECTRONICS PACKAGING: TRENDS IN TECHNOLOGIES
Nov. 11-12, 1991, co-sponsored by the SPE Piedmont-Coastal Section and the Electrical & Electronic Division, Sheraton Imperial Hotel, Research Triangle Park, North Carolina. Contact Dr. C. Maurice Balik, Dept. of Materials Science & Engineering, Box 7907, North Carolina State University, Raleigh, NC 27695-7907, (919) 737-2126.

Annual Technical Conferences (ANTEC) scheduled through 1995:
May 5-9, 1991 Montreal Convention Centre
Montreal, Canada
May 4-7, 1992 (SPE's 50th Anniversary) Cobo Hall
Detroit, Michigan
May 10-14, 1993 New Orleans Convention Center
New Orleans, Louisiana
May 2-5, 1994 San Francisco Hilton
San Francisco, California
May 8-11, 1995 Hynes Auditorium
Boston, Massachusetts

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Membership Committee Report

The Color & Appearance Division's membership has shown continuous growth since its establishment as the first formal Division of the Society. The Society's plan for the 1990-91 year established a goal of 1736 members for the CAD, a growth of 5% from June 1990 levels.

CAD growth over the last several years has been somewhat lower than this where, despite strong efforts, we were able to achieve only 3-4% per year over that period. The 90-91 plan is therefore quite ambitious, particularly in light of the recession which looms over the economy in general.

It is a pleasure to report that, as of November 1990, we have exceeded our end year goal. Membership has continued to grow at a steady pace and stands at 1781 members as of the end of calendar year 1990.

We plan to continue to push for new members by setting up and manning membership booths at all of our RETEC's. We have found that a good percentage of the attendees at these conferences are not members of SPE or CAD and we have been successful in signing up new people as a result of this effort.

A chart of recent historical growth for the CAD is shown below.

COLOR & APPEARANCE DIVISION HISTORICAL MEMBERSHIP GROWTH

BIV WHACKS

With companies everywhere at various stages in quality improvement programs, the letter below from a California reader is indeed timely.

Dear Roy:

As part of my company's "Committed to Quality" program, we are considering requesting certifications for incoming raw materials. Can you offer us any suggestions in order to make the system effective? Do certifications for colors have special requirements?

California Dreamin'

Dear Cal:

I could be flippant and suggest that since about the only colors which can be used in California have to come from roots, berries and tree bark that you avoid all the middlemen and talk directly to Mother Nature. But I'll resist that urge and outline for you the proper way to obtain Certificates of Analysis which will enhance your "Committed to Quality" program and at the same time prompt your supplier to improve his own in-house Masochism Program.

The rules for doing this are a bit complex and costly (you don't really believe that "quality is free" nonsense, do you?), but the ultimate goal, putting the entire nation's gross national product into the hands of the mental health professionals, can be achieved.

1. Design your own Certificate of Analysis form. Do not, under any circumstances, accept a supplier's own Certificate of Analysis. If designing forms is not your strong suit, the IRS can provide you with the names of several of its retirees who are eager to work as consultants on designing forms.

2. If you are purchasing six different products from one supplier, be sure to have six different forms.

3. Insist that your product code and name along with your purchase order number appear on the Certificate of Analysis. It helps to have a code with a few more characters than your supplier's computer system can handle. If the code uses a few letters from the Greek alphabet, so much the better.

4. If your supplier routinely reports color differences in CIEL*a*b*, ask for another color difference formula, preferably one that fell out of favor fifteen or twenty years ago.

5. Request the COAs reference your standard which under no circumstances should be the same as the supplier's.

6. Ask to have the COA faxed to a particular individual. Change that individual and the fax number frequently.

7. Request that all data be generated using specific and specialized tests, especially for products you purchase once a year in ten pound quantities.

8. Set tolerances which are tighter than the supplier's own and tighter than the test itself is capable of reproducing. If there is any doubt, a Delta E of 0.1 should do the trick. If you follow these guidelines you will be well on your way toward establishing a first rate quality improvement program. Remember, a sound program cannot be set up overnight. It may take four or five days. Once you have the operations I've mentioned above under control, there are a few additional refinements which can be added. If you are interested, just send me $99.95 for a complete kit. It will be sent in a plain brown wrapper. But act soon! The Postal Service is trying to shut me down.

ROY G. BIV

1990-91 Membership Program

- Program progressing smoothly with continued stable growth. See graph which charts the growth of the Division since July 1987.
- We continue to send each new member a welcoming letter which informed him/her of the benefits of membership and of the programs of the Division. It also urges their participation. I am pleased to report that this has borne some fruit recently. Ms. Renee Sommerville of Hunter Labs (703-471-6870) has contacted me as a result of my welcoming letter and has volunteered her services. She is interested in assisting with the technical aspects of our program. I have passed her name and telephone number to the TPC for their follow up.
- We actively pursued recruitment of delinquent members by sending out notices to all delinquent members requesting their assistance in correcting their membership status.
- We set up and manned a Society Information booth at the Fall RETEC in Charlotte and were somewhat successful. We know of at least two new members who joined CAD as a result of this.

Current Membership

| Members | 1781 |
| As of End December 1990 (latest available figures) | 1736 |
| 1990-91 Society Membership Goal for CAD | 1818 |
| 1990-91 Division Membership Goal for CAD | 

JOHN MacMILLAN

CAD A WINNER! RETAIN-A-MEMBER PROGRAM

Thanks to the efforts of our Division's outstanding Membership Chairman, Jack MacMillan of ICI, our Division is one of the winners in SPE's 1990 RETAIN-A-MEMBER PROGRAM. In all, there were only five Section and six Division winners, so we are in select company.

The R-A-M Program is designed to encourage Sections and Divisions to reduce their unpaid members before December 31 and receive cash awards for their results. Thanks to Jack and you, our members, we received $100 for our high level of membership renewals in 1990.
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For information on sponsorship of future issues, please contact:

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Society of Plastics Engineers

c/o Mr. Jack Graff
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