Advice & Counsel

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100 Years of Training – Part 2

Dear Readers:
It is no secret that 2009 marks the 100th anniversary of AESF Foundation (formerly AES). To mark this milestone, I began a series of articles last month which look into the history of education in the art and science of electroplating and surface finishing.

From the first course in electroplating started in 1889, we jump to 1932, when Mr. Joseph B. Kushner obtained a chemical engineering degree from Cooper Union in New York City. Like almost everyone in our industry, Joe "fell into" the electroplating field when he could not find a job in chemical engineering. Joe worked for a company involved in gold plating and began writing articles and developing gold plating solutions and selenium based rectifiers. In 1942, Joe attempted to enlist in the Armed Forces but was rejected due to poor eyesight. In 1943, he participated in the Manhattan Project, particularly in developing a nickel plating process for screens used to separate U-235 from U-238.

By 1948, Joe had written a number of manuals that were sold primarily in *Popular Science* and *Popular Mechanics*, including "Modern Chrome Plating," "Modern Brush Plating" and "Baby Shoe Metallizing." Joe also produced a practical electroplating training program titled *Electroplating Know How*, a 10-volume, ~600 page guide to the basics. In addition to this correspondence course, Joe sold baby shoe mounting bookends, picture frames and most anything else that would help make ends meet.

By 1958, Joe had gone back to school, obtained a Ph.D. in metallurgical engineering and continued to market his training school in electroplating. Joe also obtained a professorship at the University of Evansville, where he was able to perform research. His research resulted in the invention of stress measuring instruments, including the "Stressometer," which was eventually commercialized and was modestly successful.

By 1975, Joe had completely rewritten *Electroplating Know How*, renaming it *Electroplating Know How II* - 20 volumes and ~1,200 pages. Joe remained at Evansville until 1976 when he retired and moved to California. He was a visiting professor at Stanford University until his death in 1978.

Joe's son, Art had been an assistant in marketing the electroplating school from 1948, when, as a child he placed stamps on envelopes and helped stuff them for mailing. By the time Art was ready to go to college, he had made up his mind that he would NOT pursue a career in electroplating. Art pursued a chemistry degree from University of Evansville. Upon graduation, Art got a Ph.D. in physical organic chemistry from Penn State as well.

Shortly after his father's death, Art had a change of heart and took over the Electroplating School. Initially he operated the school on a part-time basis, but eventually, with key marketing assistance from his wife, Bobby, Art turned the business into a full time enterprise, conducting in-house training, consulting and correspondence based training. From 1991 to 2008, over 1,500 people attended Art's two-day programs.

In 2008, Art sold the Electroplating School to Technic Inc. and retired.

The AES, as it was known back in the 50s, 60s and 70s, had no formal surface finishing training program prior to 1972. In the 60's, Dr. Donald A. Swalheim, a research scientist retired from DuPont, became a very active supporter of the development of a visual aids program that Branches could use to create their own training schools in electroplating. The

AES Electroplating and Metal Finishing Course. Students at the AES Training Course held in Philadelphia, October 2-6, 1972. The instructors were Donald A. Swalheim, seated, second from left, Fred Pearlstein, directly behind Dr. Swalheim and Samuel Heiman, seated, at far right.

SUBJECTS OF ENTIRE VISUAL AIDS PROGRAM

1. Introduction to Plating—Prof. Nelson Murphy, Virginia Polytechnic Institute
2. Metallurgy for the Plater—Prof. H. J. Read, Pennsylvania State University
3. Principles of Polishing, Brushing and Buffing—The Lea Mfg. Company
4. Bulk Finishing and Polishing—Norton Co.
*5. Degreasing with Trichlorethylene—E. I. du Pont de Nemours & Co.
6. Alkaline Cleaning of Metals—Oakite Products Inc. & Graham, Savage & Associates
7. Plating Equipment—Ternstedt Div. of General Motors Corporation
8. Use of the Hull Cell for Quality Plating—R. O. Hull & Company
*9. Cyanide Zinc Plating—E. I. du Pont de Nemours & Co.
10. Cyanide Cadmium Plating—R. O. Hull & Company
*11. Cyanide Copper Plating—E. I. du Pont de Nemours & Co.
12. Acid Copper Plating—Udylite Corporation.
13. Nickel Plating—International Nickel Company, Inc.
14. Chromium Plating—M&T Chemicals Inc.
15. Non-Decorative or Hard Chromium Plating—Allied Chemical Corporation
*16. Corrosion-Resistant Cr Plating of Automotive Hardware—Ternstedt Division of General Motors Corporation
17. Plating Zinc Die Castings—Battelle Memorial Institute
18. Tin Plating—M&T Chemicals Inc.
19. Electrotinning Strip Steel for Tin Cans—U. S. Steel Corporation, National Steel Corporation, Can Manufacturers Institute
20. Silver Plating—Sel-Rex Corporation
21. Brass Plating—Lea-Ronal Inc.
22. Plating Precious Metals—Bell Telephone Labs.
*23. Electroforming with Nickel—International Nickel Company, Inc.
24. Applying Metals by Vacuum Metalizing—Electrochemical Industries
25. Electroless Plating—Enthone, Inc. and National Bureau of Standards
26. Plating on Aluminum—MacDermid Inc.
27. Plating on Plastics—Enthone, Inc.
28. Metal Stripping—Enthone, Inc.
29. Factors Influencing Metal Thickness Distribution—Research Laboratories, General Motors Corporation
30. Filtration of Plating Solutions—Hanson-Van Winkle-Munning Div., M&T Chemicals Inc.
31. Waste Treatment—Lancy Laboratories, Inc.
32. Chemical Milling—General Motors Corporation, et al
33. Electropolishing—Battelle Memorial Institute
34. Anodizing Al Using CrO_3 Baths—Allied Chemical Corporation
35. Anodizing Al Using H_2SO_4 Baths—Reynolds Metals Company
36. Applying Phosphate Coatings on Metals—International Rustproof Corporation
37. Chromate Conversion Coatings—MacDermid Inc.
38. Spray Methods for Applying Paints and Resins—De Vilbiss Company
39. Paint Stripping—Enthone, Inc.
40. Selection of Coatings—International Nickel Company, Inc.

*Currently available.

Listing of Visual Aids Programs in August 1965 issue of Plating Magazine.

visual aids program consisted of 35 mm slides and a text booklet that provided the information that an instructor would deliver to a class. By 1964, Dr. Swalheim and the AES Education Committee, with assistance from numerous individuals within large and small companies that were suppliers to the industry, had developed 23 of these "visual aids programs." Below is a listing of these and the authors given credit for their production, as it appeared in the August, 1965 issue of *Plating*.

A number of AES Branches and others seized upon the availability of AES Visual Aids Programs to form "Training Schools," most often in cooperation with a local university or other forum of learning. A successful school in one part of the country would spawn a competitor in another locale. By 1972, a prospective student in electroplating had a choice of at least 16 schools, including one in Cambridge, MA (at MIT), Chicago, IL (IIT), Cleveland, OH (Max Hayes Trade School), La Mesa, CA (Helix High School), Montréal, Québec, Canada (L'École Polytechnique-University of Montréal), New York, NY (Manhattan College), Philadelphia, PA (Temple University) and Santa Fe Springs, CA (Milton Weiner Laboratory).

The year 1972 was the birth year of the AES Training Course in Electroplating and Metal finishing (a five-day course). The November 1972 issue of *Plating* magazine contained the following report on the first class held on October 2 thru 6, 1972:

"The first Training Course in Electroplating and Metal Finishing sponsored by the American Electroplaters' Society was held at the Penn Center Inn in Philadelphia, Pa., October 2 to 6, 1972. While many AES Branches have conducted courses, this is the first time that the National Society has held an educational venture of this type.

"Most of the texts for the course are those developed over the last few years through the untiring efforts of Dr. Donald A. Swalheim, E.I. du Pont de Nemours & Co., Inc., a member of the AES Branch Education Committee, formerly a Chairman of that committee, and a former member of the Technical Education Board.

"There were 41 students in the class which met for intensive daily sessions throughout the week. Dr. Swalheim was one of the instructors. He was assisted by AES National Past President Samuel Heiman and Fred Pearlstein of the Frankford Arsenal, a member of the Branch Education Committee. The instructors expanded on the text considerably, gave a number of demonstrations, exhibited examples of corrosion, plating, coatings and anodizing, and made extensive use of the blackboard.

"Subjects covered were: Selection of Deposits, Chemistry - Parts 1 & 2, Electrochemistry, Electricity, Cleaning & Pickling, Hull Cell Tests, Cyanide Zinc, Cyanide Copper, Acid Copper, Chromate Conversion Coatings, Anodizing, Decorative Nickel, Decorative Chromium, Plating for Decorative & Corrosion Resistance, Precious Metals Plating, Electropolishing, Electroless Plating, Plating on Plastics, Physical Testing of Deposits, Design Precepts, Principles of Corrosion and Treatment of Cyanides & Chromate Rinses."

The November 1972 issue of *Plating* also contained a class photo, reprinted on page 12. ***P&SF***

Note: The CEF exam had not yet been created in 1972.