# Meetings

## Adirondack Conference on Electrostatics

The Adirondack Conference, which was sponsored and financed by the State University of New York at Albany and its Atmospheric Sciences Research Center and which was held 15 to 18 October 1968 in Wilmington, New York, brought together by invitation researchers in electrostatics. Day and evening meetings were held on an informal basis, each participant presenting something from his field of interest. A main objective was that each should learn of electrostatics work being done of which, in some cases, they were unaware. At the suggestion of A. D. Moore, a volunteer committee was appointed to consider revision of the definition of the term "electrostatics"; however, the attempt was unsuccessful, which surprised no one.

The presentations of coating by electrostatic application of liquids, powders, and fibers was of great interest. One of the two general systems for spray painting now in use involves atomization by air, or pressure atomization, followed by charging; in the other, atomization and charging are done concurrently. It was made clear through discussion that a variety of interesting and complex phenomena take place that are not well understood. The mechanisms by which the liquid to be atomized electrically formed into a beautiful symmetrical pattern on the edge of the rotating disc and the way electric charge is transferred from disc to atomized liquid were of particular interest.

The growing field of pesticide application, in which electric forces are used to increase the rather low efficiency of the application process, drew much interest. Various techniques for charging the particulate materials involving contact electrification and ion attachment from corona were described. Some of the many problems involved, such as the effects of humidity and unwanted dust precipitation inside the apparatus, arise from the use of these techniques in the field. Tests were described in which fluorescent materials are used to indicate the very appreciable increases in deposition attained by the electrostatic process. Such problems as the effect of natural atmospheric electric fields on the process and the possible importance of electric fields on plant pollination were also discussed. With an apple used as the test object, a small apparatus was demonstrated to show the significant effects of electric fields in improving powder application. Widespread uses of electrostatic coating techniques not generally known, such as the application of salt to potato chips and the improved smoking of hams, were described.

Discussion of the rapidly expanding field of electrostatic flocking, now used to apply the fibers to wall coating, fabrics, and carpeting, was of interest. Those familiar with the techniques agreed that, for the most part, the coating process is more of an art than a science and that conditions, such as humidity, geometry, and voltage, are generally determined almost entirely in an empirical fashion.

A few of the many aspects of hazards and annoyances caused by electrostatic phenomena were discussed. Much attention was given to the problems arising should sparks set off inflammables or explosive mixtures in hospitals. Considerable research has been performed, and good data are now available on minimum spark energies required for ignition of various gases in varied concentrations. Many hazards can be reduced by use of adequate grounding and use of conductive garments. Consideration was given to related hazards arising with inflammable materials in oxygen tents. Energies required for ignition of solids or liquids appear to be somewhat greater, but problems still occur from hair and fibers made oily and inflammable from hair dressing. It appears that, for a given spark energy, the likelihood of ignition depends considerably on time duration of the spark. With regard to aerosols, ignition is far more likely for a long duration than for a very hot, but short, spark. The very common annoyance of the mild sparks and shocks due to electrification of carpets and other textile materials was considered. A theoretical treatment, attempting to show how the electrification might be expected to depend on some of the variables involved, such as fabric resistivity, was presented.

Industrial personnel in charge of processes that develop hazards or nuisances are often nonscientific in training or outlook. The conference participants who have worked on these problems brought out an odd and interesting fact. Whereas simple means, such as humidity control to increase conduction or use of tinsel to facilitate point discharge, might suffice, those with little science background may show a strong preference for more complicated, more expensive, and often less-effective control means.

The theory and practice of electrostatic imaging techniques, such as xerography, were discussed. Considerable progress has been made in understanding the physics of the processes, but there remains an abundance of puzzling phenomena.

The very important use of electrostatic separation of mixtures drew much attention. Ore separation techniques are in use in which crushed ore particles are separated on the basis of their differing electrical properties. Ore separation plants are operating in many parts of the globe; in some cases, they are used to reprocess discarded ore tailings not economically usable by older processes. These techniques have wide application in other areas, as in processing foodstuffs. These may act not only by virtue of conductivity differences, but also by use of dipoles induced in long particles in nonuniform fields.

A good deal of attention was given to electrostatic precipitation, air cleaning, and sampling of aerosols. These processes cover a wide spectrum of phenomena ranging from adhesion of particles to each other and to surfaces, as well as the production of ozone and oxides of nitrogen under various conditions of high voltage discharges.

In the life sciences, a fact of great interest was disclosed: under some conditions electrostatic techniques can be used for differentiating and separating living from nonliving cellular organisms. It was predicted that an area of greatly increased importance will be found in the interaction of various kinds of living matter with a-c, d-c, linear, and nonlinear electric fields.

The participants at the conference considered the vastly larger scale of electrostatic phenomena of the earth's atmosphere, from fair weather electricity, involving such effects as electrification from bursting bubbles, snow and dust storms, to the violent electrical activity and intense electric fields associated with thunderstorms and volcano activity.

There was strong agreement that it would be desirable to set up a university-located electrostatics research center, specializing in electrostatics research and development of applied electrostatic techniques. Such a center could establish an electrostatics library and maintain a directory of people working in the diverse areas of electrostatics.

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### Forthcoming Events

**October**

*1–3.* American **Nuclear** Soc., San Juan, P.R. (H. Gomberg, Puerto Rico Nuclear Center, Univ. of Puerto Rico, Mayagües 00709)

*1–5.* American Soc. for **Information Science**, San Francisco, Calif. (J. E. Bryan, ASIS, 2011 Eye St., NW, Washington, D.C. 20006)

*2–5.* American Soc. of **Human Genetics**, San Francisco, Calif. (C. J. Witkop, Jr., 429 Owre Hall, Univ. of Minnesota, Minneapolis 55455)

*2–9.* **Use of Computers in Clinical Medicine**, 2nd symp., Buffalo, N.Y. (H. J. Alvis, Associate Dean, Continuing Medical Education, 211 Main St., Buffalo 14214)

*5–9.* **Electrochemical** Soc., Detroit, Mich. (E. G. Enck, The Society, 30 E. 42 St., New York 10017)

*5–9.* **Prestressed Concrete** Inst., Boston, Mass. (W. B. Bennett, Jr., PCI, 205 W. Wacker Dr., Chicago, Ill. 60606)

*5–10.* **Water Pollution Control** Federation, 42nd annual, Dallas, Tex. (R. E. Fuhrman, WPCF, 3900 Wisconsin Ave., NW, Washington, D.C. 20016)

*6–8.* International Congr. on **Antiparasites**, 3rd, Milan, Italy. (CONGITA, Via Barberini 86, 00185 Rome, Italy)

*6–10.* International Seminar on **Neoplastic Diseases**, Heidelberg, Germany. (R. H. Jackson, 10607 Miles Ave., Cleveland, Ohio 44105)

*6–10.* **Research Equipment** Exhibit and Instrument Symp., 19th annual, Bethesda, Md. (J. B. Davis, Chief, Supply Management Bureau, National Institutes of Health,