



RISK *newsletter*

Published by the SOCIETY for RISK ANALYSIS

Volume 17, Number 2

Second Quarter 1997

Risk, Public Policy, and SRA Portney Addresses Members at Annual Meeting

Rae Zimmerman, Ph.D.
SRA President

Dr. Paul Portney, President of Resources for the Future (RFF), a non-profit organization based in Washington, D.C., was invited by SRA President Rae Zimmerman to be the luncheon speaker on the opening day of the SRA meeting in New Orleans. Prior to assuming the presidency of RFF in 1995, Dr. Portney was



Rae Zimmerman and Paul Portney

RFF's Vice President and Director of its Center for Risk Management and its Quality of the Environment Division. His prior work was as Chief Economist at the Council on Environmental Quality and in visiting professorship positions at the University of California, Berkeley and Princeton University. He has brought to the risk profession keen insights about the economic aspects of risk policies in the areas of Superfund, valuation of the environment, etc. He is currently chair of the Science Advisory Board's Environmental Economics Advisory Committee.

The theme of Dr. Portney's talk was risk and public policy and the role of the Society for Risk Analysis in ongoing legislation that would greatly affect the way risk analysis tools find their way into the public policy process. He began by reviewing the extensive history of legislative initiatives in the 104th Congress, noting the considerable confusion that occurred over many of the central concepts of risk analysis, namely risk assessment, benefit cost analysis, cost effectiveness analysis, and comparative risk assessment.

Although many of the efforts at legis-

lative reform were regarded negatively by many people, Dr. Portney saw some positive developments that came out of that Congress. For example, regulators were given the discretion to set forth how much protection the measures would afford, and for what price. The amendments passed for the Safe Drinking Water Act; the Food, Drug, and Cosmetic Act; and the Federal Insecticide, Fungicide, and Rodenticide Act enlarged the role of qualitative balancing of benefits and costs and standard setting. Also, a provision was passed under the Small Business Regulatory Enforcement Fairness Act that gave Congress veto-like power; that is, it gave Congress a 60-day period following the passage of any final regulation to issue a resolution of disapproval, thus overriding some of the discretionary authority and responsibilities of regulatory agencies. Dr. Portney pointed out that the standard-setting activity underway under Section 109 of the Clean Air Act raises more issues about balancing. It potentially expands the role of quantitative risk assessment, the qualitative balancing of benefits and costs in standard-setting, exposure assessment, and risk communication, if Congress

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Communicating Scientific Information to Juries/Judges: Why Experts May Differ with the Verdict

Virginia Sublet, Ph.D.
Forum Chair

Over the last 25 years the number of court cases requiring juries and judges to understand and evaluate complex scientific information presented as evidence has increased significantly. Many recent industrial, pharmaceutical, environmental, and medical cases have involved this kind of data. To help juries comprehend this information expert witnesses are often used. Although these witnesses may be highly regarded in their scientific speciality, the credibility of the expert frequently depends on the subjective evaluation of the witness by the jury rather than the scrutiny of his scientific credentials. As a result, the perceived validity of the testimony given in court often depends on the witness' communication skills and the final outcome of the trial may be much different from what the expert witness would have predicted from the evidence. To date, there have been a number of cases in which scientific facts seem to clearly contradict the verdict. Many questions regarding the use of scientific information and the ability of experts to communicate well in the courtroom have arisen in our legal system.

On 28-29 April 1997 the Forum "Communicating Scientific Information to Juries /Judges: Why Experts May Differ with the Verdict" was held in Washington, D.C., to discuss how the communication of scientific information presented in testimony is perceived, interpreted, and ultimately judged by the court. The Forum used two case studies, (1) DNA data and (2) Silicone Breast Implant data, to

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(*Juries Forum, continued from page 1*)

explore these issues.

At the beginning of the Forum, Dr. Virginia Sublet, Sublet & Associates, Columbus, Ohio, provided an introduction on the "Special Challenges of Presenting Scientific Information in the Courtroom" which reviewed the pertinent literature on the communication issues surrounding how witnesses interact with juries and judges. Following this presentation, Mr. James Wooley, J.D., Justice Department, Cleveland, Ohio, gave an overview of the basic issues involving court procedures and expert witnesses titled "Presenting Technical Evidence to Juries: The K.I.S.S. Principle." Dr. Richard Meserve, J.D., Covington and Burling, Washington, D.C., presented a discussion of "Science in the Courtroom" from the perspective of the defendant and cited many cases where expert witnesses have been faced with the challenge of presenting scientific information to juries.

These initial presentations were provided as a background for attendees unfamiliar with the communication and courtroom issues to be explored in the Forum over the next two days. Following these introductory discussions, the first case study on DNA was presented by three prominent scientists in the field of forensic biochemistry and molecular biology. The speakers provided information about DNA data as evidence, discussed the need for standardization of the data, and described insights gained from providing expert testimony in DNA cases. Dr. Jennifer Smith, Director of the Federal Bureau of Investigation DNA Laboratory, Washington, D.C., provided background information on what DNA is, how it is used in the courtroom, and the advantages and disadvantages of its use as evidence in her presentation, "Forensic DNA Analysis--The Benefits and the Limits." Dr. Roger Kahn, Director of the Ohio DNA Crime Laboratory, Columbus, Ohio, discussed "Forensic DNA: Revolutionary Science in an Adversarial Environment." The objective of Dr. Kahn's presentation was to explain the new criteria to standardize DNA analysis techniques to improve the quality of DNA test results. Dr. Robin Cotton, Director of the DNA Laboratory, Cellmark Laboratories, Germantown, Maryland, provided her insights gleaned from her experience as an expert witness in several high visibility trials in her presentation, "Issues and Questions that Arise from Providing Expert Testimony." Following these presentations a panel discussion was held emphasizing the communication issues associated with presenting DNA data to a jury of lay persons.

The second day, Forum participants considered some of the research issues surrounding how juries understand epidemiology data. Dr. Molly Johnson, J.D., Federal Judicial Center, Washington, D.C., presented her data from her dissertation research titled "Can Juries Understand Scientific Evidence? A Preliminary Investigation."

Following this presentation, the Silicone Breast Implant case study was presented by three nationally known experts. The three speakers provided background surrounding the Food and Drug Administration's (FDA) decision about Silicone Breast Implants, a discussion of the differences between scientists and lawyers dealing with these cases, and a discussion of how experience plays an important role in becoming a more effective expert witness where large monetary awards are involved. The first speaker was Dr. John Sargent, Chief Medical Officer, Vanderbilt University Medical Center, Nashville, Tennessee. Dr. Sargent, a rheumatologist, was a member of the FDA Task

Force assembled to evaluate the Silicone Breast Implant data and make recommendations to the FDA about its validity. Dr. Sargent's presentation was "Product Liability and the FDA." Dr. Marcia Angell, Executive Editor, *New England Journal of Medicine*, Boston, Massachusetts, discussed "Two Cultures: Scientists and Lawyers and Breast Implants." Dr. Angell thoroughly examined the role of each of these professionals in the evaluation and resolution of breast implant cases. The final speaker in this case study segment was Dr. Noel Rose, Professor of Pathology and Director of the Division of Immunology, Johns Hopkins University School of Medicine, Baltimore, Maryland, who spoke about his experience as an expert witness. His presentation was titled "1 Loss and 3 Wins: What Makes the Difference?" and concentrated on how changing his approach to the jury was instrumental in improving how he was perceived by the jury and the success of his testimony.

Following Dr. Rose's presentation, Dr. Beth Wiggins, J.D., Federal Judicial Center, Washington, D.C., discussed new advancements in "Helping Juries to Understand Scientific Information." The last hour of the Forum was dedicated to a panel discussion of the pertinent communication issues evident from the discussion of these two case studies that influence how expert witnesses are perceived by the court. A more extensive analysis is currently being written which will deal with the speakers' insights and conclusions and recommendations from the Forum.

The quality of the speakers and of the topics presented in this two-day discussion was enthusiastically appraised by attendees. The Forum itself received a very high evaluation score (4.8 out of a possible 5). Of the many positive comments, one example is provided below in a letter from Barie Carmichael, Vice President & Executive Director of Corporate Communications, Dow Corning Corporation:

"The speakers and dialogue were uniformly outstanding. Probably the best index of the quality of the forum was the sustained attendance and participation throughout the session! I know this was a labor of love. Please be assured that those attending appreciated greatly your interest and tenacity in bringing this forum to life."

Other SRA Forums

The Forum "Biologically Based Dose Response Modeling: Fact or Fallacy?" was held 1-3 June in Annapolis, Maryland, and provided an update and critical review of the development and use of biologically based dose response models for risk assessment.

"Risk of Extreme and Rare Events" will be held 25-26 August in Washington, D.C. This Forum, chaired by SRA President-Elect Yacov Y. Haimes, will focus on rare and extreme events within the overall risk-based decision-making process, where trade-offs among costs, benefits, and risks can be generated and evaluated. Organizers/presenters include Haimes, Quarles Professor of Engineering and Applied Science and Director of the Center for Risk Management of Engineering Systems, University of Virginia; Nicholas C. Matalas, a hydrologist with the U.S. Geological Survey; and James H. Lambert, Research Assistant Professor with the Department of Systems Engineering and the Center for Risk Management of Engineering Systems, University of Virginia. For more information contact the Secretariat, phone: 703-790-1745. ♦♦♦

(Portney, continued from page 1)

goes in the same direction on clean air as it went on drinking water and food safety.

Dr. Portney said that there is a very long list of technical issues that challenge us in risk assessment, risk communication, and risk management, and he chose to address a few of those future questions and challenges:

1. *The ability to value the extension of life and prevention of premature mortality.* Epidemiology, clinical research, and toxicological research show that air quality improvements since 1970 have played some role in extending life. A key question is, "How can we value that benefit?"

2. *Assessing the risks and valuing the benefits from reducing the prevalence of hormone disrupting chemicals in the environment.* In connection with this, the measurement and differentiation between exposures and delivered doses need to be explored further.

3. *Differences between expert and popular perceptions about risk.* No agency administrators could be successful unless they were both taking into account what their experts were saying and also listening to the public about those problems with which they are concerned. We simply have to find a way to pay attention to both if we're going to be effective in regulating.

4. *A recognition of the increasing role of stakeholder regulation as a new way of resolving environmental questions.* Dr.

Portney's term, "stakeholder regulation," is based on a talk he had heard recently at the National Academy for Public Administration. This approach has had renewed interest because of a loss of confidence in the federal government, the potential for reducing the cost of litigation, and the fact that it taps knowledge resources from these groups.

Dr. Portney then discussed the ramifications of stakeholder regulation. It will give technical people an even greater role in regulation; however, it means obtaining the skills to provide inputs to a much less specialized, much broader set of audiences. This further implies that we will have to improve language skills, including the ability to explain the pros and cons of the decision analytic techniques that we use. For example, in benefit-cost analysis, it means explaining often unsettling assumptions underlying the analyses, which is important for credibility. Second, we will have to become better listeners. Third, we need to improve the way we teach. Fourth, we have to find ways of rewarding creative research that is interdisciplinary in nature and aimed at facilitating solutions. The way we are currently organized into academic disciplines does not expedite this, Dr. Portney pointed out.

Over the last 15 years, the Society for Risk Analysis' accomplishments have done a considerable amount to overcome educational barriers and interdisciplinary boundaries. Dr. Portney concluded his address by saying he was confident we would succeed in overcoming the hurdles that are before us.

Report from the 1996 SRA Business Meeting

SRA's 1996 business meeting, held 10 December at the Society's Annual Meeting in New Orleans, was opened by President John D. Graham, who asked members to each write down the name of an individual interested in risk analysis who is not a member of SRA. The names will be used to compile a list of potential members. Graham said 400 names were turned in at the Hawaii meeting and 40% of those people became new SRA members when contacted.

1996 Annual Meeting Chair's Report

"We actually hit the jackpot this year," announced Meeting Chair Rae Zimmerman, referring to the highest attendance number ever for an SRA Annual Meeting. She reported that there were 756 preregistered attendees and that 67 student members attended. Zimmerman said the 1996 Meeting included a very broad spectrum of interests, a new initiative with the International Society of Exposure Analysis, and a number of other new initiatives like the roundtable discussions which expanded the interaction on specialties and interests such as university programs. She thanked the Program Committee and everyone else involved in making the meeting a success.

Treasurer's Report

Treasurer Paul Price divided his report into three sections:

(1) The past—Price said the SRA did not fare as well in 1995 as anticipated. Income for 1995 was \$440,000 and expenses were \$476,000, leaving a \$36,000 shortfall (a detailed report is in the Fourth Quarter 1996 RISK newsletter). One of the reasons for this shortfall was that the Annual Meeting is relied on as a major source of income and the Meeting in Hawaii did not

bring in as much as budgeted. The meeting was harder to attend and some participants dropped out at the last minute, so the Society had to call on reserves to help pay for it.

(2) The present—The SRA was doing considerably better in 1996. A good return from the 1996 Annual Meeting was expected.

(3) The future—Price reported that the 1997 Annual Meeting in Washington, D.C., should provide a significant source of income for this year.

Secretary's Report

Secretary Gary Flamm announced the results of the 1996 elections—President-Elect: Yacov Haimès; Treasurer: Paul Price; Councilors: Robin Cantor, William H. Farland, and H. Christopher Frey; retiring from the Council: Past President Elisabeth Paté-Cornell, and Councilors Caron Chess, Yacov Haimès, and Tohru Morioka.

Flamm also reported that membership had not changed dramatically, with 2,043 members in the SRA at that time. [Not all memberships were in at that time; membership is now 2,400.]

President's Report

President Graham reported that the awards structure of the SRA has been expanded with the creation of two new awards. The Chauncey Starr Award is given to an outstanding young risk analyst under the age of 40, and the Outstanding Practitioner Award emphasizes the practice of risk analysis in the public and private sectors.

Graham then welcomed Rae Zimmerman as the new President of SRA. ◆◆◆



SRA-Europe and SRA-Japan

Announcing the *Journal of Risk Research*

Ragnar E. Löfstedt, Ph.D.

The first issue of *Journal of Risk Research*, the Official Journal of the Society for Risk Analysis-Europe and one of the official journals of SRA-Japan, will be published in time for the 1997 SRA meeting to be held 7-10 December in Washington, D.C. The journal aims to:

- Stimulate the intellectual debate on risk within Europe, Japan, and elsewhere to promote better management of risks and to increase the quality of risk research.
- Address the growing concern about the role of risk in modern society, including industry officials, regulators, and academics.
- Serve the growing diversity of the risk community. We will also address issues and concerns outside the current focus of the North American literature, and thus provide the reader with a variety of interesting research results and experiences.
- Address risk research areas that are of interest to the members of SRA-Europe and Japan, as well as areas that have been largely neglected by several of the mainstream journals. These include engineering and social/policy sciences.

The journal will be published four times a year and comprise the following sections: letters to the editor and viewpoints, research articles with occasional commentaries, research notes, book reviews, news of upcoming risk conferences, and membership news. Articles will be published in English, with the possibility of submitting abstracts in other languages. The journal will accept theoretical and empirical research articles in the areas of behavioural, engineering, physical, and social sciences, and articles related to decision making and policy issues in all disciplines. We will aim for rapid publication and do our utmost to accept and publish within a short time frame and avoid long waits for authors.

• **Editor:** Ragnar E. Löfstedt, Risk Research Group, Centre for Environmental Strategy, University of Surrey, Guildford, Surrey GU2 5XH, U.K.; phone: +44-1483-259096; fax: +44-1483-259394; e-mail: R.Lofstedt@surrey.ac.uk

• **Book Review Editor:** Jonathan Sime, University of Surrey, Guildford, U.K.

• **SRA-Europe News Editor:** Graham Long, University of Surrey, Guildford, U.K.

• **Associate Editors:**

Louis Goossens, Technical University of Delft, the Netherlands; Philippe Hubert, ISPN, Paris, France; Saburo Ikeda, Institute of Policy and Planning Sciences, University of Tsukuba, Japan; Roger Kasperson, CENTED, Clark University, Worcester, U.S.; Lennart Sjöberg, Center for Risk Research, Stockholm School of Economics, Sweden

• **Editorial Board:**

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Advisory Board

Council and Executive Committee Hear Advice from Advisory Board

B. John Garrick, Advisory Board Chair

At the 1 May meeting of the SRA Council and Executive Committee, SRA President Rae Zimmerman presided over a discussion of topics presented by the SRA Advisory Board. The Advisory Board is made up of prominent members of the Society to advise the President and Council on ways to enhance the professional status of the Society. The Board was represented by Chair B. John Garrick.

The topics discussed included increasing Society membership, taking public positions, risk education, student participation in Society activities, quality of proceedings and papers, continuity of operations, and the Society's chapters and specialty groups. In reference to specialty groups there was considerable discussion of the merits of a risk management specialty group. Garrick highlighted the Board's analysis of each topic and led the discussion with the Council and Executive Committee. The topics resulting in the most discussion were the taking of public positions, chapters and specialty groups,

and the issue of membership.

Among the actions considered were (1) for public positions, obtain better information from the membership to determine if there is a consensus on whether or not the Society should put forth position statements, (2) for chapters and specialty groups, provide stronger ties with the national Society and increase the involvement of "big names" in the risk field to generate interest and excitement about the Society, and (3) for membership, increase support to the membership committee especially in the area of getting the word out on the benefits of membership in the Society.

President Zimmerman was confident that the combination of the Advisory Board's report and the 1 May presentation provided the Council with excellent source material to make informed decisions on the future direction of the Society with respect to these important issues. Zimmerman praised the Advisory Board for its excellent analysis of Society issues and suggestions for improvements and corrective actions. ♦♦♦



Committees

Electronic Media Committee

Steve Brown, Chair

The new SRA Web Site is a success. Through May, the site had attracted about 2,500 visitors and over 30 new members through on-line signups. Almost 200 abstracts for the 1997 Annual Meeting were also submitted via the on-line form. An electronic version of the RISK newsletter is now available on-line about two weeks after receipt of the printed version by the members.

My only disappointment is that we have had relatively few suggestions for improving the design or adding content. The site is intended to serve the interests of the membership, and we need to hear from you about features you would like to see added or changed. The site's URL is <www.sra.org>; comments can be sent to the Committee by using the messaging features under "Contact SRA" or by sending e-mail to <sra@idiom.com>.

Public Policy Committee

Gail Charnley, Chair

The SRA Public Policy Committee sponsored a luncheon symposium at the National Press Club in Washington, D.C., on 13 May. The symposium addressed the risk management decision-making process and the associated conflicts between health-based standards, uncertain science, and cost and feasibility considerations. The controversy over the recently proposed revisions to the national ambient air quality standards for particulates and ozone provided the speakers with a timely focus for the discussion.

The American Chemical Society's (ACS) Risk Education Project cosponsored the symposium. It was part of both SRA's and ACS's efforts to foster and promote the knowledge and understanding of risk issues by presenting the diversity of positions on the issues along with the scientific and policy bases of that diversity.

Daniel Greenbaum, President of the Health Effects Institute, Cambridge, Massachusetts, moderated the symposium. He provided the Clean Air Act context, reviewing the background on the proposed revisions to the standards, and posed questions for the other speakers to address as they gave their views on the role of science in policy making: How certain is the science? How certain does the science have to be? What role should cost play?

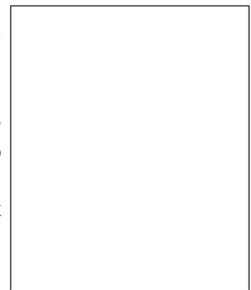
Jonathan Samet, Johns Hopkins School of Public Health, discussed the scientific background and strength of the evidence associating air pollution in general and particles in particular with morbidity and mortality. Larisa Dobriansky, counsel for Representative David McIntosh and the House Government Reform and Oversight Committee, expressed the Congressman's views that until the substantial scientific uncertainty about particle-related



Jonathan Samet

health effects is reduced and the benefits of reducing exposure are better characterized, more stringent standards are inappropriate. He believes that the science implicating particles in disease and mortality is incomplete: the effects of particles can't be separated from the effects of other air pollutants and it is not clear that instead of being responsible for the adverse effects that have been reported, particulate matter could be just a dose indicator for the effects of the air pollution mixture itself. Particulate matter is heterogeneous and the roles of the different components are unknown. She stated that the Environmental Protection Agency (EPA) failed to take into account the extensive scientific uncertainty and the magnitude of the benefits of controlling particulates when it proposed the new standards, did not subject the standards to adequate peer review, and has not explored risk management alternatives other than stringent standard setting. She urged Harvard University and other institutions to work with EPA to improve the information available and its analysis, believing that the new standards will have multibillion-dollar consequences and very uncertain health benefits.

Jimmie Powell, Deputy Staff Director for the Senate Committee on Environment and Public Works, supported the view that the science is too weak to support more stringent standards, adding that the public health benefits of the new standards do not justify the resources needed to achieve them. He stated that the current ozone standard does not protect children and asthmatics with an "adequate margin of safety" as required by the Clean Air Act, and that the public health benefit of the new standard, by comparison, would be insignificant and not measurable. He mentioned a study performed by the Office of Management and Budget, based on information from an EPA report, which suggests that lowering the ozone standard might actually increase risks from cataracts and skin cancer because even at ground level, ozone could have protective effects. He recommended that the regulatory focus should be on particulate matter, not ozone, if reducing particulate exposures can actually save lives, although he too believes that the science is too weak at present to support the proposed standards. It will take until 2002 to get a detection network for 2.5 μ -size particles up and running, so we might as well keep doing the research necessary to clarify the science and wait until then to change the current standard. He believes that the new standards are a threat to communities' commitments to work to achieve current Clean Air Act standards.



Jimmie Powell

Katherine Hohmann, representing the Sierra Club, provided a different perspective on the Clean Air Act issues and brought the discussion back to the larger context of how science should be used in decision making. She asserted that the Clean Air Act provides a fundamental means for environmental protection that has successfully reduced the concentrations of pollutants in air and that does indeed protect us with an adequate margin of safety. She supported EPA's proposed standards and the process by which they were obtained, which included independent peer review in the form of the Clean Air Scientific

Advisory Committee. She believes that the scientific evidence clearly demonstrates that ozone and particulates have an adverse effect on health and declared the environmental movement to be united behind the new standards, saying that "no action" is not an acceptable alternative. Knowing the exact mechanism by which a substance elicits toxicity is not necessary for regulatory action to take place. She pointed out that basing a risk management decision purely on a risk assessment is like buying a car based solely on the consumer price index (CPI); risk assessment and the CPI are only tools that should be used to inform, but not be the sole determinants of a decision. She reminded us that voluntary risks should not be confused with involuntary risks and that the money spent to eliminate one risk is not fungible; that is, failing to spend it on one threat does not mean that it will be spent on a more important threat. She stressed the importance of the precautionary principle, emphasizing that we will never really know "enough" about the science and that failing to act unless we know it all has much too big a price. During the discussion with the audience that followed, there was much argument about the nature, quality, and strength of the evidence supporting the new standards. Greenbaum concluded that the questions he had posed at the beginning had been addressed, although the answers were certainly varied and consensus seemed unlikely.

Conferences and Workshops Committee

Elizabeth L. Anderson, Chair

Tenth Annual SRA Health Risk Assessment Symposium Human Health Assessment: Current Issues

The Tenth Annual SRA Health Risk Assessment Symposium will be held in California at the Monterey Plaza Hotel, 400 Cannery Row, Monterey, California, 6-8 October 1997. This is the first time that the SRA Annual Symposium has been held on the West Coast. Plans for the three-day Symposium have been completed; the preliminary agendas will be mailed shortly. The Symposium will follow the same format as in prior years. The most recent events in risk assessment guidance will be covered by Dr. Richard Becker, Director, Office of Environmental Health Hazard Assessment, California EPA, and by Dr. Robert Huggett, Assistant Administrator, Research and Development, EPA. Other lectures will cover topics ranging from current state-of-the-art in applications of risk assessment to biologically based modeling and reproductive health risk. Several prior presidents of the SRA will deliver lectures as will this year's President, Dr. Rae Zimmerman, who will speak on the social dimension of risk communication.

A third day has been added to the program this year to discuss two case studies: diesel risk assessment and environmental tobacco smoke risk assessment. Speakers will present the recently released California draft risk assessments on these two topics. The program will also include lectures involved with federal risk assessment efforts and related research. This third day promises to be an exciting addition to the Symposium. The Symposium Committee is chaired by Dr. Elizabeth L. Anderson. (The e-mail address for Anderson, Chair of the Conferences and Workshops Committee, has changed; it is now <elanderson@sciences.com>.)

Publications Committee

The SRA has negotiated discounts on other journals for SRA members in recognition of the various disciplines represented within the Society. The mechanisms are now being worked out, and discounts are anticipated to be in the 10-30% range. Journals currently under consideration are:

Journal of Risk and Uncertainty
Int'l Journal of Reliability, Quality, and Safety Engineering
Risk of Decision Policy
Journal of Exposure Analysis
Health and Ecological Risk Assessment (HERA)
Risk Health Safety and the Environment

Chapters and Sections Committee

Charles Menzie, Chair

Work is underway to develop a "how to" package for use by SRA chapters. The package is based on the experience of chapters and will include tips on how to set up and operate a chapter. Examples of newsletters, charters, and dues collection systems will be included.

At the last SRA Council meeting further progress was made on the speakers bureau. In particular, the councilors agreed that past and present officers of the Society, councilors, and fellows should be available as members of the speakers bureau. During the coming year, the Society will try to provide speakers for between four and eight chapter events. For further information, chapters should contact Charlie Menzie at phone: 508-453-4300, e-mail: <Charliemen@AOL.COM>.

The mission statement for SRA chapters was formally adopted at the December meeting. Presidents of chapters should become familiar with the statement and share it with their local membership.

SRA Meetings and Forums: American Board of Industrial Hygiene CM Credits

<u>Meeting/Course</u>	<u>ABIH Approval #</u>	<u>CM Points Awarded</u>
1996 SRA Annual Meeting 12/8-12/96	4327	.5 CM Point per .5 day, 4.5 CM Points total
1997 SRA Annual Meeting 12/7-10/97	4328	.5 CM Point per .5 day, 4.5 CM Points total
Communicating Science Info to Juries/ Judges: Why Experts... 4/28-29/97	4333	.5 CM Point per .5 day, 2 CM Points total
Biologically Based Dose Response Modeling: Fact or Fiction 6/2-3/97	4334	.5 CM Point per .5 day, 2 CM Points total
Risk of Extreme and Rare Events 8/25-26/97	4335	.5 CM Point per .5 day, 2 CM Points total
10th Annual SRA Symposium--Health Risk Assessment 10/6-8/97	4336	.5 CM Point per .5 day, 3 CM Points total



Specialty Groups

Risk Science & Law Specialty Group

Wayne Roth-Nelson, Interim Chair

Risk Science and the Law

Thirty members now comprise the Risk Science & Law Specialty Group (RSLSG) just six months after seven founding members formed an interim executive committee at the Society's Annual Meeting in New Orleans. Members are divided half and half between scientists and lawyers, with five members who are scientists as well as lawyers.

Following a well-attended first-year Symposium on Risk Science and the Law that engaged enthusiastic audiences, the 1997 RSLSG program committee is busy laying out the RSLSG's December program for Washington, D.C.

A second-year Symposium is being designed by executive-committee member Katy Kunzer, Chemical Manufacturers Association, in collaboration with interim Secretary-Treasurer Paul Locke, Environmental Law Institute.

The proposed Symposium will feature panel presentations and panel/audience interaction under two themes: (1) Legal Consequences of Making Regulatory Decisions in the Face of Uncertainty and (2) Uses of Risk Assessment in Toxic Injury Lawsuits.

Other candidate themes are (3) Prospects for Regulatory Risk Legislation and (4) Communicating Health Risk to Juries and Judges. At least one poster session is proposed to feature recent regulatory and toxic tort cases in which risk assessment played a critical role. It is anticipated that one or more poster sessions will serve as the foundation for a "Case Book" of risk-related judicial decisions which the RSLSG would like to produce.

Interim Chair Wayne Roth-Nelson and other RSLSG members were invited by the Division of Chemistry and the Law, American Chemical Society (ACS), to represent the RSLSG in an ACS Symposium on Explaining Science to Jurors and Judges at the ACS National Meeting in Las Vegas (September 1997). This event is a prime opportunity for the RSLSG to establish a role in the larger "Science and Law" community.

Recruitment of new RSLSG members continues online via RiskWorld and RISKANAL and also using small mailing lists, such as one targeting environmental lawyers identified as having a risk assessment specialty practice.

Contact Wayne Roth-Nelson for membership details and an RSLSG registration form.

Copies of the recent RiskWorld feature article on the RSLSG and the final RSLSG draft mission statement are available on request.

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Risk Communication Specialty Group

Steven Lewis, Chair

Bob Griffin Elected Chair-Designate

Last December in New Orleans, the Risk Communication Specialty Group (RCSG) voted Bob Griffin as designate to take the Chair of RCSG at this year's Annual Meeting. Comments on the RCSG's direction, suggestions for programs, and praise or complaints can go to me or to Bob (see numbers and e-mail addresses below).

1997 Continuing Education Program Being Developed

In addition to becoming Chair-Designate, Bob is organizing the 1997 (fourth annual) continuing education program on risk communication. This year's proposed program is "Risk Communication Workshop: Working With the News Media." Considering the great interest expressed at the RCSG's last meeting, room for attendance may be severely limited. Please WATCH for the preliminary program and SIGN UP early.

No Real Progress on Outreach for New Members

There's only the most limited progress to report on compiling a list of individuals to whom the RCSG might outreach for new members. Brandon Johnson (New Jersey Department of Environmental Protection and RCSG Past Chair) has provided his holdings of names and addresses of individuals who have requested New Jersey publications on risk and the environment. HELP! Anyone who is interested in helping the RCSG grow, and who has the time and talent to assemble/collate this valuable information, please let me know. Suggestions for other outreach efforts are always welcome.

Student Award to be Given at SRA Annual Meeting

Exxon has offered to fund an unrestricted prize of \$500 to be awarded to the first author of the best STUDENT paper or poster on the topic of risk communication at this year's Annual Meeting. Two urgent needs exist. First, with input from the SRA Awards Committee, a subgroup of the RCSG must develop a set of criteria by which to judge candidate papers/posters. Second, a panel of judges will be needed. Anyone who would like to help should contact me or the Secretariat as soon as possible.

P.S. Although travel to meetings will not be required, your commitment to participate in conference calls will be necessary.

Start Thinking About Your Future and the Future of RCSG

In the next newsletter, nominations will be solicited for upcoming RCSG elections. In addition, leaders for ad hoc working groups (continuing education, awards, program, membership, etc.) are always in short supply . . . and desperately needed. Have an idea? Make it happen at RCSG!

Contact: Steve Lewis
Voice: 908-873-6063, Fax: 908-873-6009
STEVEN.LEWIS@ERE.EXXON.SPRINT.COM

or: Bob Griffin
Voice: 414-288-6787, Fax: 414-288-3099
6710GRIFFINR@VMS.CSD.MU.EDU



U.S. Chapter News

The **Chicago Regional Chapter** of the SRA elected the following new officers for 1997-1998 at its meeting on 14 April 1997: Sean T. Dundon, President; Margaret M. MacDonell, Secretary-Treasurer; and Fred R. Kirchner, President-Elect (1998-1999).

Sean T. Dundon has an M.S. in nuclear engineering and health physics from the University of New Mexico, 1993, and a B.S. in public health from the University of Massachusetts, 1990, and is currently in the Master of Business Education Program at DePaul University, Kellstadt Graduate School of Business. Mr. Dundon is a Project Manager at IT Corporation in Itasca, Illinois. His activities at IT include transportation risk analyses for the Nevada Test Site waste management operations, human health risk assessment for the BP Chemical RFI, risk assessment for Newark Air Force, and human health risk assessment for a chemical manufacturing facility in the Chicago area in support of RCRA compliance.

Margaret McKiernan MacDonell has a Ph.D. in environmental health engineering from Northwestern University, 1986, an M.S. in environmental health engineering from the University of Notre Dame, 1981, and a B.S. with honors in biology from the University of Notre Dame, 1979. Dr. MacDonell is currently Manager of the Chemical Health Risk Section, Environmental Assessment Division, Argonne National Laboratory. Her primary areas of research include evaluation of integrated chemical, physical, and biological data; analysis of contaminant fate and transport (including biouptake), exposures, and toxicities; and characterization of risks, including cumulative impacts for contaminated DOE sites. She conducts risk analysis training workshops for DOE managers and coordination of the "State and Tribal Forum on Risk-Based Decision Making," 12-15 November 1995.

Frederick R. Kirchner has a Ph.D. in radiation biology from the University of Iowa, 1979, an M.S. in radiation biology from the University of Iowa, 1975, and a B.S. in biology from Loras College, 1973. Dr. Kirchner is an Environmental Scientist/Toxicologist with the Chemical Health Risk Section, Environmental Assessment Division, Argonne National Laboratory. Areas of research interest are chemical toxicology/risk assessment for complex mixtures of hydrocarbons, radiological health risk assessment, and computer applications. Responsibilities include health risk analyses for DOE projects related to requirements of RCRA and CERCLA; interpretation of EPA guidance on risk assessment methods; evaluation of release mechanisms and the environmental fate of contaminants, human receptor, and exposure pathways; and development of toxicological profiles of key contaminants.

The **Lone Star Chapter** (LSC) held its first meeting this year in Houston on 22 May at the University of Texas School of Public Health. The main program was a panel discussion on communicating environmental risks to the public. The panel members led an excellent discussion based on their extensive experiences in dealing with the public on environmental issues through public meetings, press conferences, jury trials, and community education programs. The participants were Norma Goldman, Goldman Public Relations Company, Inc., Houston; Thomas D. Downs, University of Texas, Houston School of Public Health; and Sharon Mattox, Vinson & Elkins,

L.L.P., Houston.

The next LSC meeting will be held in Austin later this summer.

The LSC is pleased to announce the launching of its web page designed by LSC Past President John Mikus. The URL for the LSC site is <<http://members.aol.com/sralcs>>. Some possibilities being considered for the site are displaying notes and graphics from meetings, exchanging technical information, electronic publication of the chapter newsletter, and linking of the site to the national SRA and other sites.

The one-day interactive seminar "New and Emerging Risk Issues," sponsored by the **SRA Metro Chapter (New York-New Jersey-Connecticut)** and cosponsored by Columbia University, was held successfully in New York City on 29 May 1997. The two principal speakers from EPA had impressive credentials: Dr. Dorothy Patton is Executive Director of the Science Policy Council and Dr. William Wood is the Executive Director of the Risk Assessment Forum. Dr. Rae Zimmerman, SRA President, talked briefly about the Society's risk-related initiatives including the Annual Symposium and the different Forums. Professor Joseph Graziano, Chairman of Environmental Health Sciences Division, Columbia School of Public Health, made closing remarks. Dr. Rao Kolluru, President of the Metro Chapter, chaired the meeting.

Thirty-three professionals from industry, consulting firms, government, and educational institutions participated in the seminar. We aimed at a balanced group of 30 to 35 participants to permit maximum interaction. The seminar included a combination of emerging risk issues and case studies. The participants broke up into groups and explored the perspectives of the community, industry, and the regulators. The feedback from participants about the seminar was highly positive. A copy of the seminar notebook is available for educational purposes from Dr. Kolluru at 201-316-9300.

For information on the New York-New Jersey-Connecticut Metro Chapter, please contact Dr. Kolluru, President (201-316-9300), or Dr. Linda Erdreich, Secretary (212-686-1754). To join or renew membership, make out a \$15 check payable to Society for Risk Analysis-Metro and send to Linda Erdreich, Bailey Research, 292 Madison Avenue, New York, NY 10017.

If you have suggestions on topics for future meetings, including venues for potential monthly meetings, please contact either of the above or any of the officers of the chapter.

At its 14 May seminar, the **New England Chapter** heard speakers Jennifer C. Charles, Charles Consulting, and Charles A. Menzie, Menzie-Cura & Associates, Inc., discuss "Identifying Southeast Asian Immigrant Populations in Massachusetts at Risk from Eating Contaminated Shellfish." Also at the May seminar, Paul J. Miller, Northeast States for Coordinated Air Use Management, spoke on "Long Range Transport of Ozone in the Eastern United States."

The 11 June seminar featured speaker John Jacobson, Manager of Environmental Sciences, Yankee Atomic Electric Company, who presented "Natural Phenomena Hazards in New England."

The Chapter gives special thanks to Sandy Baird who is re-

signing as Secretary of SRA-NE. Sandy has provided invaluable service and motivation for meeting those monthly newsletter deadlines. Sandy maintained the electronic membership list of over 300 and circulated the electronic version of the newsletter. Good luck, Sandy!

Please send any announcements (job openings or seekers, conferences, new guidance, etc.) for future New England Chapter newsletters to Chris Rioux, Camp Dresser & McKee Inc., Ten Cambridge Center, Cambridge, MA 02142; phone: 617-252-8761, fax: 617-621-2565, e-mail: <RIOUXCL@CDM.COM>.

For new and renewed memberships in the New England Chapter, send your name, address, and affiliation to Arlene Levin at Eastern Research Group, 110 Hartwell Ave., Lexington, MA 02173; phone: 617-674-7200. Dues are \$15 per year for full memberships and \$7.50 for student memberships.

For general information about the Chapter, contact Dale Hattis, President of SRA-NE, Center for Technology, Environment, and Development, Clark University, 950 Main Street, Worcester, MA 01610-1477; phone: 508-751-4603, fax: 508-751-4600, e-mail: <dhattis@vax.clarku.edu>.

The **Northern California Chapter** of the SRA (NCCSRA) elected the following 1997 officers: President-Elect Leonard Levin, Secretary Robert Howd, and Councilor Lynn Haroun. They are joined by President Steve Brown, Councilor Tom McKone, and Treasurer Rob Scofield. Because the race for President-Elect was essentially a dead-heat, David Liu has agreed to help Dr. Levin with the chapter program for the rest of the year. The results were announced at the 3 June joint meeting of the NCCSRA with the Northern California chapters of the Society of Toxicology and the Genetic and Environmental Toxicology Association. The theme of the meeting was "Environmental Estrogens and Endocrine Disruptors," and speakers included Fred vom Saal, University of Missouri; G. Shymala, University of California, Berkeley; Peggy Reynolds, California Department of Health Services; Michael Denison, University of California, Davis; and Shanna Swan, California Department of Health Services.

The **Research Triangle Chapter** (RTC) has completed its spring season of monthly presentations. In April, Professor Bob Clemons, Fuqua School of Business, Duke University, discussed "Correlations and Copulas for Decision and Risk Analysis."

In May, Ravi Subramaniam, Chemical Industry Institute of Toxicology, presented a discussion of respiratory tract modeling titled "Interspecies Extrapolation of the Uptake of Soluble and Reactive Gases in the Nasal Passages."

The chapter presentations will adjourn for the summer and resume in the fall.

Other upcoming events include the annual RTC workshop/symposium, which this year will consider model validation. RTC is also happy to announce that it will again sponsor a student travel award to enable local graduate students to travel to and participate in the SRA Annual Meeting in December. Applications and additional information will be available in August.

The Chapter's web site URL has been changed; it is now <<http://www4.ncsu.edu/~frey/rtcra.html>>.

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Canada: Louise Houde, 514-289-5378, houdel@envir.hydro.gc.ca

Pitt Receives \$5 Million DOE Award

The University of Pittsburgh Graduate School of Public Health has been selected to receive a \$5 million award from DOE for a five-year training program for post-doctoral fellows in radiation research.

Pitt will recruit annually six highly qualified candidates with scientific or medical doctoral degrees for the program which will include course work and research in scientific areas including health risk assessment, health physics, radiation epidemiology, and radiobiology. Stipends offered will be \$33,500, first year, and \$36,000, second year.

For more information on this post-doctoral program, contact Dr. Niel Wald, phone: 412-624-2735, fax: 412-624-7534, or e-mail: <wald@vms.cis.pitt.edu>.



News and Announcements

Program Committee Chosen for 1997 Annual Meeting

The program committee for the 1997 SRA Annual Meeting includes Chair Yacov Haimes, Elizabeth Anderson, Scott Baker, David Burmaster, Robin Cantor, Gail Charnley, Annie Jarabek, John Keller, Kate Kunzer, James Lambert, Lester Lave, Stan Levinson, Paul Locke, Michael McElvaine, Ali Mosleh, Larissa Rudenko, Bob Tardiff, Bill Van der Schalie, and Rae Zimmerman. The program committee met 9-10 June in Alexandria, Virginia, to sort submitted papers and decide the layout of the program. Preliminary programs will be sent to all members and those nonmembers having presentations at the meeting.

The 1997 Annual Meeting will be at the Capital Hilton, Washington, D.C., 7-10 December. With the theme "Improving Public Policy Through Risk Assessment and Risk Management," three major topics are representative of the envisioned sessions for the Meeting: Physical Infrastructures, Service Systems and Consumer Products, and Theory and Methodology.

Exhibits: There will be an exhibition of risk products and services at the Annual Meeting. For further information on exhibiting, contact Lori Strong or Sue Burk at phone: 703-790-1745, fax: 703-790-2672.

Book Exhibit: For \$50 per title, books will be displayed and each attendee will be provided information through our list of publications. The list will include prices, any discounts that may be offered, and ordering information. For more information or book reservation forms, contact Lori Strong at phone: 703-790-1745, fax: 703-790-2672.

Preliminary Program: Preliminary programs will be mailed to members of the Society, as well as to those non-members whose abstracts have been accepted. Final programs, containing the abstracts, will be available at the Meeting in December. Preregistration and hotel reservation materials will be mailed as a part of the preliminary program.

Session Types: Presentations are expected to be approximately 60% oral and 40% posters.

Address Change for SRA Journal

The new address for *Risk Analysis: An International Journal*, edited by Curtis Travis, is:

795 Main Street West P.O. Box 5088
Oak Ridge, TN 37830 Oak Ridge, TN 37831

Phone: 423-220-8700
Fax: 423-220-8704
E-mail: <baldwine@icx.net>
or: <traviscc@icx.net>

SRA Membership Fliers

The Society has produced membership fliers. Any members interested in receiving the fliers to pass on to colleagues and to have available at meetings should contact the Secretariat at phone: 703-790-1745, e-mail: <sraburkmgmt@aol.com>.

Professional Society Liaisons and Activities

SRA continues to promote liaison activities and affiliations with other professional societies whose missions are similar to those of SRA. These connections range from cosponsorship of activities to official affiliation status with another society, where such a program exists. Following are some recent major activities in this area.

The American Association for the Advancement of Science

The SRA has applied for and was granted official affiliate status with the American Association for the Advancement of Science (AAAS) by its Council at the February meeting in Seattle.

The AAAS is a very old multi-disciplinary scientific soci-

ety, which also addresses risk-related issues in the natural, physical, social, and health sciences. SRA's request for enrollment in the Sections on Engineering; Medical Science; Psychology; Social, Economic, and Political Sciences; and Societal Impacts of Science and Engineering were also approved.

Many SRA members are also members of AAAS, and some are Fellows. SRA members who are also members of any of the AAAS sections above are urged to contact either President Rae Zimmerman (zimmrmnr@is2.nyu.edu) or the Secretariat.

The next meeting of AAAS is 12-17 February 1998 in Philadelphia. We would like to extend thanks to one of our members, Professor Eugene Rosa of Washington State University, for bringing this program to our attention.

The International Association for Probabilistic Safety Assessment and Management

The International Association for Probabilistic Safety Assessment and Management (IAPSAM) is a society devoted to the application of probability assessment and risk-based approaches to safety problems. Many of IAPSAM's concerns overlap with those of SRA.

Examples of some of the leading members of SRA who are active in IAPSAM are SRA Councilor Robert Mulvihill; Professor Ali Mosleh, University of Maryland, Technical Program Chairman of the IAPSAM fourth annual conference; and George Apostolakis, SRA Fellow and Outstanding Service Award winner in 1991.

SRA will be working with IAPSAM on its fourth annual conference to be held in New York City at the Grand Hyatt Hotel, 13-18 September 1998. The deadline for abstracts is 1 November 1997.

For further information on the conference, contact the PSAM 4 home page on the World Wide Web at <<http://www.enre.umd.edu/iapsam/>>.

First World Congress on Risk Analysis: Year 2000

The SRA now has members from over three dozen countries. Moreover, the issues that SRA deals with are typically international in scope, and SRA's two sections--SRA Europe and SRA Japan--have gone very far in expanding the international focus of the Society. Since different countries are often at different stages in the understanding and use of risk assessment, risk management, and risk communication, it is timely to have an international congress on these risk analysis themes. The SRA is planning its first world congress on risk analysis in the year 2000 to be held in Europe, with the purpose to (1) foster an exchange of ideas through an international conference and (2) develop and obtain consensus on a set of broad principles on risk assessment, risk management, and risk communication applicable to policy making, priority setting, and

education, including linkages among these areas.

Members of the planning committee include the current SRA President Rae Zimmerman, President-Elect Yacov Haimes, Past President John Graham, President-Elect Designate, a representative from SRA-Europe, and a representative from SRA-Japan.

The SRA Secretariat in the U.S. would provide the administrative, contractual, and logistical details for the Congress, with input from SRA-Europe.

The committee for SRA-Europe includes Joanne Linnerooth Bayer, Ortwin Renn, Ragnar Löfstedt, Ray Kemp, and Philippe Huber.

Other sponsors from outside SRA are expected to participate in and support the Congress.



Advertisements

Risk Assessor

The Environmental Laboratory of the U.S. Army Corps of Engineers, Waterways Experiment Station (WES), Vicksburg, MS, is seeking an individual with a background in Environmental Risk Assessment (i.e., Human Health and Ecological) to assist and manage on-going risk-based research. Applicant should have advanced degree (Ph.D., Sc.D.) in environmental science, toxicology, or related discipline with demonstrated experience in risk assessment/risk management. Responsibilities will include evaluating a wide range of environmental stressors related to the Corps' mission (e.g., dredged material management, military related contamination, etc.). Good communication, interpersonal, and technical writing skills are essential. Expertise in modeling (including an understanding of probabilistic techniques) and statistics is desirable. Interested individuals should send résumé/C.V. to Dr. David W. Moore. WES is an equal opportunity employer. CEWES-ES-F, 3909 Halls Ferry Rd., Vicksburg, MS 39180-6199. Telephone: 601-634-2910; fax: 601-634-3713; or e-mail: <moored.3@ex1.wes.army.mil>.

Risk Assessment Specialist--Australia

Career Marketing Associates is a Colorado-based recruiting and search firm. Since 1981 we have been the nation's most active firm in the placement of toxicology, risk assessment, and product safety personnel.

A large Australia-based environmental consulting firm has engaged us to identify a senior person to join a growing risk assessment practice. They require a graduate degree in an environmental or public health discipline and five or more years of experience in contaminated site risk assessment. While the emphasis is on human health risk assessment, knowledge of ecological risk principles is desired. Previous experience with a North American-based engineering or consulting firm is preferred.

Representatives of the company will be interviewing in the U.S. in late July. All inquiries and referrals will be held in complete confidence. Interested parties may contact Mr. Terry Leyden, Vice President, Career Marketing Associates, 7100 E. Belleview Avenue, Suite 102, Greenwood Village, CO 80111; phone: 303-779-8890; e-mail: <tjl@cmagroup.com>; World Wide Web: <www.cmagroup.com>.

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Risk newsletter advertising policy

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Organizations may purchase space for advertisements of employee openings at a cost of \$250 for a 3.25-inch-wide by 3-inch-high column in 10 point Times type with 11 point leading. The column length of an ad may be increased beyond 3 inches at a cost of \$100 per inch. Camera-ready ads are accepted.

Individual members of SRA may place in the *newsletter*, at no charge, an advertisement seeking employment for themselves as a benefit of SRA membership. The advertisement must fit within a 3-inch-high column.

Books, Software, Courses, and Events

Advertisements for books, software, courses, and events will be accepted at a cost of \$100 per inch in a 3.25-inch-wide column in 10 point Times type with 11 point leading.

The *newsletter* is published four times a year. Advertisements should be submitted to the editor, with billing instructions, no later than 1 March for the First Quarter issue (April), 1 June for the Second Quarter issue (July), 1 September for the Third Quarter issue (October), and 1 December for the Fourth Quarter issue (January).



RISK newsletter
is published by
the Society for
Risk Analysis

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Deadline for RISK newsletter submissions

Information to be included in the Third Quarter 1997 SRA RISK newsletter, to be mailed at the beginning of October, should be sent to the Editor at the address above by 20 August.



Member News

Risk Assessment and Management Handbook for Environmental, Health, and Safety Professionals (McGraw-Hill, 1996) and *Environmental Strategies Handbook: A Guide to Effective Policies and Practices* (McGraw Hill, 1994), edited by **Rao Kolluru**, President of the SRA Metro Chapter (New York-New Jersey-Connecticut) and affiliated with CH2M Hill, are being translated into Chinese by Peking University Press.

The Risk Handbook is also being translated into Japanese by Sumika Tech Info Service (Sumitomo Chemicals). Contributing authors to the Risk Handbook include many members of the SRA: **Steven Bartell, Vincent Covello, Jeffrey Driver, David McCallum, Susan Santos, and Roy Smith**. The Handbook is being used widely as a text and reference in interdisciplinary programs.

Bruce Allen, President of SRA's Research Triangle Chapter, would like to announce the formation of his own company, RAS Associates. Headquartered in Chapel Hill, North Carolina, RAS Associates specializes in quantitative/modeling support for risk assessment applications ranging from dose-response and pharmacokinetic analysis to site sampling and statistical design.

Please contact Bruce at RAS Associates, 101 Corbin Hill Circle, Chapel Hill, NC 27514; phone: 919-408-0923; e-mail: <BCA_RAS@compuserve.com>.

Thank You to SRA Sustaining Members

The Society for Risk Analysis gratefully acknowledges the financial contributions of the sustaining members for 1996:

BP Chemical Inc
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The first 1997 sustaining member is **EA Engineering, Science, and Technology Inc.**

***Don't forget your Annual Meeting, 7-10 December 1997.
Be sure to preregister.***

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