

STC**NEWS / NOUVELLES****VOLUME XVI NUMBER 1, MARCH 1997****EDITOR: M.G. PRIOR****OFFICIAL NEWSLETTER OF THE SOCIETY OF TOXICOLOGY OF CANADA****C.P./P.O. Box 517, Beaconsfield, Québec, Canada H9W 5V1**

THANKS TO DON AND BETTY ECOBICHON

This edition of News/Nouvelles is dedicated to Don and Betty Ecobichon for their many years of effort and dedication to the Society of Toxicology of Canada and to NEWS/NOUVELLES. As announced in the last edition, and co-incident with his retirement from McGill University, Don has stepped down as Editor of the newsletter. With Don and Betty as indefatigable editors and Gordon Krip as tireless publisher, the Society and the membership has been very well served indeed for the last fifteen years.

In recognition of Don's long and meritorious service to the Society and his new status as Editor Emeritus, Don was presented with a commemorative Plaque at the President's Reception at the Annual Meeting on December 5, 1966 in Montreal. In what is probably a foretaste of his "retirement", Don could not be at the meeting to receive his Plaque, he was presenting a course in Thailand. Society President Gail Bellward presented the Plaque to Betty who read letter from Don to the Society.

Don and Betty will be moving to a new retirement home north of Kingston in the near future. We can expect to continue to receive the benefit of Don's incisive views on the state of the universe in toxicology in future editions of NEWS/NOUVELLES. Until then and on behalf of the entire membership, thanks Don and Betty, and *bon chance* in your retirement.

A THANK YOU from D.J. Ecobichon

I would like to take the opportunity to thank the Society for the honour bestowed upon myself and my wife, Betty, at the President's Reception during the Annual Meeting in December. NEWS/NOUVELLES was begun in May, 1982, the result of a Board decision at the end of my term as President (December 1981), as a means of maintaining communications with our far-flung and diverse membership, I think that it is not presumptuous to admit that it has been a success. It is fitting that the plaque commemorating 15

years of editorship bears both of our names because Betty has been the individual who transfers my sometimes illegible scrawl into the word processor, editing (deleting) items that she thinks are "politically incorrect" and preparing the final version of NEWS/NOUVELLES. It was also appropriate that Betty was able to attend the presentation in my stead since I was on my way to Thailand to honour a previous commitment. Reports have reached my ears to the effect that she even edited the short speech that I left for her to read when she said that she was at a loss for suitable words! We will treasure this momento from the Society.

STC OFFICERS FOR 1997

Following the Annual General Meeting, here is the list of Society officers for 1997:

President Dr. Gail Bellward
Past President Dr. Doug Arnold
Vice- president Dr Len Lillie
Secretary Dr Tom Massey
Treasurer Dr. Michel Charbonneau
Councillor Dr. Roger Keefe
Councillor Dr. Francine Denizeau
Councillor Dr. Laurie Chan
Executive Director Dr. Gordon Krip

Chairman - Scientific Program Committee Dr. Warren Foster
Chairman - Symposium Committee Dr. Gordon Krip
Chairman - Nominations Committee Dr. Doug Arnold
Chairman - Science Policy Committee Dr Heather Durham
Chairman - Education Committee Dr. Jim Brien
Chairman - Membership Committee Dr. Gordon Krip
Chairman - Science Communications Committee Dr. Geoffrey Granville
Chairman - Newsletter Committee Vacant

FROM THE EDITOR'S DESK - Michael Prior

Most of you know by now that NEWS/NOUVELLES has a new editor. Let me introduce myself. Michael Prior: a chronologically-gifted person who in previous lives has been veterinarian and researcher, toxicologist and teacher, writer and watercolourist, entrepreneur and bureaucrat, husband and grandfather, a person honoured to follow in the steps of Don Ecobichon's editorship.

Thirty years ago we started our westward trek across Canada, from Hull, P.Q. Last year we settled in our home overlooking the Georgia Strait. Sechelt, BC, is geographically on a peninsula of the mainland of Canada. Our BC Ferry is like a rate-limiting mechanism, allowing arrivals and exits only at two-hourly

intervals. Our recent winter snow storms illustrate more basic elements of toxicokinetics. For thirty years we lived on the prairies, so we were no strangers to snow! But the white stuff here is wetter, stickier, and heavier than the prairie snow, probably more like the Maritimes variety. And it can be veeeeery interesting to drive on! Soon after Christmas we had a "dump", as did much of BC. In fact, the rest of Canada was cut off from us. Well over 50 cms was a respectable depth of snow, which would take several weeks to disappear on the prairies. To the amazement and joy of us newcomers, this was eliminated in two or three days. Of course! Ambient temperature strongly influences $T_{1/2}$, the elimination half-life of snow.

Let's move from the metaphor of the world around us as toxicological reflection to when Don Ecobichon started NEWS/NOUVELLES in 1982. He wanted a mechanism for communications within the Society of Toxicology of Canada. Today, that is still the prime reason for NEWS/NOUVELLES. Here's how it works: you, dear reader, send news to me, I'll send it out in NEWS/NOUVELLES to the other STC members, who send more news to me, which I'll send out in NEWS/NOUVELLES and so we communicate. Editorially speaking, the rate-limiting step is the amount of news I receive. NEWS/NOUVELLES is a vehicle for communication by and for the members of STC. I invite you to contribute to its ongoing success and usefulness by reading it, discussing it, and writing for it (e-mail accepted by michael_prior@sunshine.net).

FROM THE PRESIDENT'S DESK - Dr Gail Bellward

In the last edition, I provided some details on the financial problems of the Canadian Federation of Biological Societies. We discussed this at the Annual General Meeting in December and I received 34 questionnaires back from the mailing sent to all members. The following is a summary of your opinions:

The majority of members want the AGM to remain in December and do not want to meet with the Canadian Federaton of Biological Societies (CFBS) in June,

Very few people suggest increasing or decreasing the CFBS fees by very much. Most prefer the \$30 or \$45 range.

The great majority of members feel that lobbying is the most important function of CFBS. It should be noted that CFBS spent considerable time lobbying for science and technology, and is helping us lobby for retention of research laboratories at the Health Protection Branch, Health Canada.

Very few people suggested that STC give notice to withdraw from CFBS. In fact, most want to actively support the CFBS.

This has provided me with important information that I will pass on to the Board of CFBS. Clearly, STC will remain a member of CFBS, continue to pay our membership dues and support the lobbying efforts. However, we will not give up our successful December meeting.

Another thorny problem is the proposed closure of the Bureau of Drug Research (BDR) at Health Canada. This has been suggested as a cost-cutting measure, with the functions of BDR to be carried out by the drug companies themselves, other Health Canada groups, or contracted out to commercial or academic laboratories. STC has a number of concerns about this proposal, including the following:

Everyone is charging overhead fees these days and the decreased efficiency involved may not result in cost-savings.

Neither academic nor commercial labs can drop everything else and concentrate solely on a government problem until it is solved. Liability is also a major issue.

The loss of independent expertise from active government researchers will be very negative. It has taken a great deal of time and money to build up this expertise; it can be lost overnight. This does not appear to make monetary sense.

The BDR has made a number of important contributions to the public health of Canadians; for example, the initiation of bioequivalency guidelines, development of assay methods for various constituents in drug products, solving of problems related to inactive products, etc.

Unfortunately, we Canadian scientists have generally not "blown our own horns". If you are concerned that the closure of BDR will adversely affect the quality of drug products in Canada with little saving in cost, please write to

The Honourable David C. Dingwall, Minister of Health, Brooke Claxton Building, 16th Floor, Postal locator 0916-A, Tunney's Pasture, Ottawa, Ontario K1A 0L2

as soon as possible and before April 1, 1997, the proposed date of closure. See the next item **FROM THE SECRETARY'S DESK** and also **NEWS FROM OTTAWA** later in this issue of NEWS/NOUVELLES.

FROM THE SECRETARY'S DESK - Tom Massey

How can we convince Canadian politicians that biomedical research needs to be supported?

The results of the September 1996 MRC competition have again underscored the fact that there simply is not enough grant money available to support all the highly qualified biomedical scientists in this country. Out of 1,111 applications for operating grants, 259 were successful, reflecting an overall success rate of 23%. A higher proportion of renewals were successful (51%) versus 17 to 19% for new applications, although the same rating cutoff was used for new and renewal applications.

Among the many disastrous consequences of this frighteningly low success rate was the termination of grants to many established and highly productive scientists. There is clearly a "bunching" of grants rating

near the cutoff for success. Since grants are rated on a scale of 0 to 5, it turns out that the second decimal place in a grant's score can determine whether it is funded or not. For example, a grant with a score of 3.92 might be funded, while one rated at 3.90 could be unsuccessful. Is the grant rated 3.92 really better than the one rated 0.02 points lower? There is no way that the grant review process can make a valid distinction with this degree of precision. In fact, in your grant application, if you proposed to use an assay with precision to two significant figures at best, but the data you were to generate required three significant figures in order to detect differences between treatment groups, reviewers would come down hard on you - and rightly so. The proposed method of analysis is not sensitive enough. Nonetheless, that is what is happening in the rating of the many grant applications bunched around the cutoff for success. This means that, for many applications, success or failure is a matter of chance.

A case in point is a colleague of mine. In the September 1996 MRC competition, he submitted a new grant application which was unsuccessful. When he received the reviews (four from external reviewers and two from panel members), all assessments were either "very good" or "excellent". The Scientific Officer's summary of the panel discussion of this application did not indicate significant weaknesses in the proposal. It is very frustrating for the applicant to figure out how to improve the application for re-submission. In fact, the logical conclusion is that the application was clearly worthy of funding, but insufficient funds were available.

The situation in universities has been worsened by major cuts to operating funds from provincial governments. The impact of these cuts varies between universities. At Queen's, the major effect in biomedical sciences has been a large reduction in support staff. This translates into investigators picking up more of the duties that formerly were handled by secretaries and technicians. The net result is that the academic staff has less time for research, at a time when research funding is harder than ever to get. This, coupled with the fact that an increasing proportion of the successful grants are going to research institutes rather than to universities, cannot bode well for the future of undergraduate and graduate student training.

Letters published recently in *Science* and *Nature Medicine* highlight the grim state of health research funding in Canada. A startling graph in a letter by Joe McAllister (*Nature Medicine* 2(12):1290-1291, 1996) compares the MRC budget to that of equivalent agencies in the United Kingdom, Australia, Germany, France and the United States. The health research budgets have steadily increased since 1990 in all the countries except Canada. In 1997, MRC Canada's budget is below 1990 levels, and rapidly dropping.

Albert Aguayo and Richard Murphy (*Science* 275:139, 1997) point out that it is unrealistic to expect business to pick up the slack caused by dropping government funding. While there are many cases of successful research partnerships between academia and industry, carrying the bulk of the cost of basic research simply is not, and will not become, the responsibility of companies. It is not within their mandate.

The question we have to answer is how we can convince our political leaders that basic research and post-secondary education in Canada are critical investments for the future of Canada's strength, and that providing adequate funds must be a high priority, as they are in other countries. This makes giving serious

consideration to the future of STC's involvement in the Canadian Federation of Biological Societies, our Society's major lobbying agent, a particularly important matter.

COOPÉRATION INTERNATIONALE KANSAÏ-QUÉBEC EN ENVIRONNEMENT. PROF. GASTON CHEVALIER, RESPONSABLE.

Une entente cadre de coopération a été signée cette année entre la Conférence des recteurs et principaux des universités du Québec (CREPUQ) et l'Université d'Osaka au Japon. Cette coopération entre la région de Kansai et le Québec remonte à 1994 alors qu'une première entente était intervenue, sous l'égide du ministère des Affaires internationales et du ministère de l'Éducation du Québec, entre le réseau universitaire de la CREPUQ et l'Université de Kyoto. L'entente vise à promouvoir les échanges internationaux et prend la forme d'ateliers qui traitent des quatre thèmes prioritaires retenus par les partenaires en vertu de leur importance scientifique et économique: les télécommunications, la biotechnologie, l'environnement et les nouveaux matériaux. À ce jour, trois ateliers ont eu lieu dont deux au Québec (télécommunications et biotechnologie) et un au Japon (environnement) .

Le deuxième atelier international Québec-Kansai en environnement s'est tenu les 23 et 24 octobre à l'UQAM organisé conjointement par le centre interuniversitaire de recherche en toxicologie (CIRTOX), le centre de recherche en toxicologie de l'environnement (TOXEN), le département de Génie civil de l'Université Laval, la station expérimentale des procédés pilotes en environnement (STEPPE) ainsi que le Department of Environmental and Sanitary Engineering de l'Université de Kyoto et l'Institut des sciences de l'environnement de l'UQAM, ce deuxième atelier international Québec-Kansai en environnement fait suite au premier qui s'est déroulé, en 1994, à l'Université de Kyoto.

Cet atelier a permis de faire le point sur des recherches de pointe dans le secteur de la qualité des eaux. Quatre thèmes ont été abordés par six chercheurs japonais et douze québécois reconnus internationalement, soit:

1 Eaux usées: nouveaux traitements.

2 Eaux potables: traitements de pointe, évolution de la qualité de l'eau et contrôle dans les réseaux de distribution.

3 Eaux naturelles: nouvelles stratégies de contrôle de la pollution dans le fleuve Saint-Laurent et son bassin, dans le fleuve Yodo et le bassin du lac Biwa.

4 Eaux souterraines: bioprocédés de traitement des sols contaminés.

Le choix de thèmes d'intérêt majeur pour les deux parties vise à multiplier les possibilités de coopération durable. Par ailleurs, le budget alloué au projet par le gouvernement japonais laisse entrevoir la possibilité de stages futurs au Japon.

Les deux jours de colloque ont été suivis d'une journée de visite industrielle aux usines de traitement des eaux (potables et usées) Charles J. des Bailleurs et de la CUM ainsi que la biosphère. L'événement a réuni plus de soixante professeurs, chercheurs et étudiants universitaires québécois ainsi que des gestionnaires et spécialistes du domaine oeuvrant dans les secteurs public et privé. Responsable de l'atelier: Dr. **Gaston Chevalier**, CIRTOX, Département des Sciences Biologiques, UQAM, C.P. 8888, Succ. Centre-ville, Montréal, Québec, H3C 3P8. Fax: (514) 987-4647. E-mail: chevalier.gaston@uqam.ca

TWENTY-NINTH ANNUAL SYMPOSIUM - 1996

The Twenty-ninth Annual Symposium of the Society of Toxicology was held December 5, 6, 1966 at the Midtown Holiday Inn, Montreal. The principal themes for the 1966 meeting were The Molecular Basis of and Assessment of Birth Defects and Cancer. As an experimental format, the second day was devoted to a Workshop on Applications of Molecular Biology. The Scientific Program Committee (Chairman Peter Wells, Warren Foster and Robin Walker) put together an excellent program with a combination of Society members and outside speakers. As usual, the meeting attracted a large number (33) of poster presentations: an excellent opportunity for Society members, especially students, to present work completed or in progress, exchange interests, and network with other members working in similar areas.

This year, also as a new venture, the Board appointed a Symposium Committee (Jon Daniels, Bertin Trottier and Harpal Buttar) to work with our Executive Director, Gordon Krip on the mechanics of the Symposium including local arrangements, corporate fund raising, the poster session, and publication of the Symposium Proceedings. This year, in addition to the expanded abstracts of the scientific presentations, the Proceedings include detailed handbook type material from the Workshop presentations which should make the Proceedings particularly useful. Copies are available for \$25.00 each from the STC Executive Director. Thanks to all involved for making the Twenty-ninth Symposium a success.

1996 STC VEYLIEN HENDERSON AWARD

The 1996 Veylien Henderson Award was presented to Dr. P. David Josephy of the University of Guelph. The Henderson Award is intended to honour an individual under 45 years of age who has made a significant contribution to toxicology in Canada.

Dr Josephy is currently Professor of Chemistry and Biochemistry at the Guelph-Waterloo Centre for Graduate work in Chemistry. He completed his B. Sc. in Honours Physics at the University of Toronto in 1976 and his Ph. D. at the University of British Columbia in 1981 under the supervision of Dr. L. D. Skarsgard at the B. C. Cancer Research Centre. Dr. Josephy completed a post-doctoral fellowship at the National Institute of Environmental Health Sciences in 1981-1982 under the supervision of Ron Mason, an international authority on the mechanisms of toxicity caused by free radicals, and the identification of free radicals by spin trapping. He joined the faculty of the University of Guelph in January 1983.

Dr. Josephy received the Henderson Award for significant contributions to research and teaching in

toxicology. His development in collaboration with Dr. Denis Grant of the University of Toronto of bioengineered strains of *E. coli* and *S. typhimurium* expressing human N-acetyltransferases was a critical step in furthering our understanding of the critical role these enzymes play in the metabolic activation of mutagenic and carcinogenic xenobiotic amines in humans. He recently described the potentially significant role of peroxides in the metabolic activation of and the potential contribution of these mutagens to human breast cancer.

Dr. Josephy is the author (with chapters by several outstanding toxicologists in the U. S. and Europe) of the textbook Molecular Toxicology recently published by Oxford University Press.

1966 STC AWARD OF DISTINCTION

The 1966 Society of Toxicology Award of Distinction was presented to Dr. Jules Brodeur. The Award of Distinction is intended to honour those individuals who have made outstanding and sustained contributions to the science of toxicology in Canada and/or to the Society of Toxicology of Canada. Here is Dr. G.L. Plaa's introduction.

It is a real pleasure to present the Award of Distinction of the Society of Toxicology of Canada to Dr. Jules Brodeur for his outstanding career and contributions to toxicology.

Jules received his M.D. degree from the Université de Montréal in 1961 and was bitten by the academic bug, thanks to his first mentor Dr. Aurèle Beaulnes, the enthusiastic founder of the Département de pharmacologie at the Université de Montréal. Jules went to the University of Chicago to train with an eminent toxicologist, Dr. Kenneth DuBois. Jules' training was in classical toxicology, and he received the Ph. D. Degree in 1964.

Upon returning to the Université de Montréal, Jules embarked on establishing drug metabolism and toxicology in the newly organized department. Full of enthusiasm, he joined a dynamic group of young, dedicated professors and never looked back. Jules was a driving force in this team and a real leader. He set into motion a very reputable research program in toxicology and began training Ph.D. candidates. His leadership qualities were recognized by other institutions, and it is certainly one of the best things that ever happened to the Université de Montréal when Jules Brodeur decided to continue his academic career in that institution.

Later, Jules became chairman of the "Département d'hygiène du milieu" with the mandate to revamp the department and implant occupational medicine. The name of the department was changed to "Département de médecine du travail et d'hygiène du milieu" and new professors were recruited. Research in industrial toxicology became a major endeavour of the renovated department. Also, a unique inter-faculty graduate level diploma program was created in toxicology, and over 110 candidates have been awarded a degree in this program under Jules Brodeur's able guidance. Jules has also been the research supervisor of 21 Ph.D. students, all with a major orientation in toxicology.

The contributions of Jules Brodeur to research in toxicology are important. The central theme of this research is really "prevention". The majority of his works have an impact on how toxicity can be prevented. His earliest research dealt with chemical interactions and his latest concerns the toxicity of simple mixtures. He is an ardent proponent of toxicokinetics in the risk assessment process. He established a unique human exposure inhalation facility at the Université de Montréal, and has been one of the experimental subjects as well. It is not unusual to see him writing letters or a report at a table inside the chamber, while being exposed to some chemical or other for metabolism or kinetic studies.

Besides all of these accomplishments, and many more, Jules Brodeur is a remarkably humble person. His quiet manner, always respectful of the feelings of others, is really unique and one of his greatest authorities. Everyone who has had contact with him is touched by his gentleness. One can truly say that Jules Brodeur in all aspects of his life is truly a "Gentle Man".

It is a great honor and privilege for the Society of Toxicology of Canada to bestow the 1996 Award of Distinction to Dr. Jules Brodeur.

Hommage au Dr Jules Brodeur

Le Dr Jules Brodeur a reçu des mains du Dr Gabriel Plaa le Prix du mérite 1996 de notre Société à l'occasion du dernier Congrès annuel. Il convient de rappeler ici les principales étapes de la carrière de ce pilier de la toxicologie humaine au Canada et de cet ardent promoteur de la Société de toxicologie du Canada.

Le Dr Jules Brodeur obtient de l'Université de Montréal un diplôme de docteur en médecine en 1961, une maîtrise en pharmacologie l'année suivante puis un doctorat en pharmacologie de l'Université de Chicago en 1964. Il vient très tôt à la recherche fondamentale en toxicologie après son recrutement par le Département de pharmacologie de l'Université de Montréal en 1964. Sa valeur en tant que chercheur et administrateur étant vite reconnue, il est nommé directeur du Département d'hygiène des milieux en 1976 qu'il transformera en Département de médecine du travail et hygiène du milieu pour mieux refléter les besoins de la société québécoise de l'époque. Il demeure directeur de ce département jusqu'en 1986.

Membre du premier groupe de recherche canadien en toxicologie reconnu par le Conseil de la recherche médicale du Canada, ses travaux de recherche en toxicologie sont subventionnés par cet organisme pendant plus de 25 ans. De 1982 à 1990, le Dr Brodeur est directeur de l'équipe associée de recherche en toxicologie industrielle de l'Institut de recherche en santé et en sécurité du travail du Québec. Il est le premier récipiendaire du Prix de la recherche en santé et en sécurité du travail accordé par cet organisme en 1990. Cela fait suite au Prix Léon-Lortie qui lui a été accordé par la Société Saint-Jean-Baptiste l'année précédente. Enfin, en 1996, il reçoit le Prix du mérite de la Société de toxicologie du Canada. Innovateur dans plusieurs domaines, il est notamment à l'origine de la création du Diplôme d'études supérieures spécialisées en toxicologie de l'Université de Montréal et responsable de ce programme de 1982 à 1996. Diplômé de l'American Board of Toxicology, il préside la Société de toxicologie du Canada de 1987 à 1989. Sous sa présidence, la Société voit le nombre de ses membres étudiants grimper de façon

importante, reflétant l'importance qu'il accorde à la place des étudiants dans la discipline.

Auteur de plus d'une centaine d'articles et de près de 150 communications scientifiques, le Dr Brodeur a toujours considéré que les nouvelles connaissances acquises en recherche doivent conduire à l'amélioration du sort de la collectivité. Il est une source d'inspiration non seulement pour les dizaines d'étudiants de deuxième et de troisième cycle qu'il a dirigés, mais aussi pour les autres étudiants du département et pour ses collègues. Sa légendaire empathie et son immense respect pour les personnes en ont fait un modèle pour plusieurs.

C'est en reconnaissance d'une carrière scientifique prestigieuse, d'un humanisme exemplaire et d'un dévouement sans borne pour le développement de la discipline de la toxicologie que la Société de toxicologie du Canada lui a accordé le Prix du mérite 1996.

C'est également pour ces raisons que le Département de médecine du travail et hygiène du milieu a créé le Prix JulesBBrodeur à l'intention de ses étudiants. Ce prix sera en effet attribué sur une base biennale à l'étudiante ou l'étudiant du Département qui aura le plus impressionné le jury sur le plan de ses qualités scientifiques, de sa contribution générale à la vie départementale. Pour 1994-1996, le jury composé des docteurs Gabriel Plaa, professeur émérite du Département de pharmacologie de l'Université de Montréal, Lise Goulet, professeure agrégée du Département de médecine sociale et préventive de la même université et Marc Baril de l'Organisation mondiale de la santé a désigné Mme Michèle Bouchard, étudiante au doctorat en toxicologie de l'environnement sous la direction du Dr Claude Viau.

NEWS ABOUT STC MEMBERS

Two of CanTox's Principals have recently accepted appointments to prestigious scientific committees, adding to the national and international committees on which senior CanTox staff participate. Dr. Earle Nestmann was appointed by the President of the Royal Society of Canada (RSC) to the RSC Committee on Expert Panels. This committee has the mandate to organize and oversee expert scientific panels to deal with various scientific issues of importance to Canada and to the health of Canadians. Dr. Ian Munro has accepted the Chairmanship of the U.S. National Academy of Sciences Subcommittee on Upper Safe Reference Levels of Nutrients. This group will be recommending maximum daily intakes of many vitamins and minerals. The recommendations will be used by the U.S. Food and Drug Administration and could have an impact on non-prescription drugs and dietary supplements.

SNIPIT: PARTICULARLY ABOUT PARTICULATES

Particulate matter (PM) is big right now. Actually, the particles themselves are small, up to 2.5 or 10 microns in diameter; called PM_{2.5} and PM₁₀ for short. Big refers to their putative health effects: higher death rates to be particular (if you'll excuse the pun). Several studies in different countries report a correlation between PM₁₀ and increased mortality rates and other health effects. What is generating

intense debate is that the Harvard six-city study in the early 1990s found a link between the $PM_{2.5}$ concentration and over 60,000 premature deaths each year. The U.S. Environmental Protection Agency is proposing a $PM_{2.5}$ rule, which is expected to generate a storm of comments. But will they clear the air? One regulatory problem is source apportionment: much of the particulate matter arises from natural environmental activity, hardly amenable to regulatory action! Control of anthropogenic sources requires specific targeting to reduce emissions effectively, e.g. vehicle emissions, industrial activity, etc. If that wasn't enough, please explain how PM causes disease in the lung. How might that cascade to death or adverse health effects? Once again toxicologists and other scientists are faced with assisting society and politicians deal with an injurious agent that may not have a threshold concentration below which it is non-injurious. That is, the No Observable Adverse Effect Level (NOAEL) is zero. We hear a lot about the actions of the U.S. Environmental Protection Agency; would someone please comment on the work done on PM_{10} by the CEPA/FPAC Federal/Provincial Working Group on Air Quality Objectives and Standards?

BOOK REVIEW

MECHANISMS AND CONCEPTS IN TOXICOLOGY. W. NORMAN ALDRIDGE. TAYLOR AND FRANCIS, 1996. 254PP. \$60 CAN.

A nice compact text from a different point of view - linking mechanisms of action with toxicity (target, organ and receptor) and presenting a variety of examples, not just Norman's well known work in organophosphorus and carbamate esters. As well, there are good summaries for the mechanistic aspects of n-hexane, acrylamide, and organotin polyneuropathies, reproductive effects and glycol ethers and rare earth target organ effects. He covers the delivery of toxicants, biotransformation, initiating reactions with targets and consequences (cell and membrane perturbation and functional changes, apoptosis and necrosis) as well as examining dose-effect relationships, thresholds and biomonitoring. Small chapters toward the end discuss epidemiology, ecotoxicology and risk assessment, again with examples. Fortunately, this book appeared in press just before Norman died. It is a fitting memorial to the man he was. Toxicology has lost one of our greatest scientists and philosophers. This book should be on your shelf.

OF WEBS AND NETS AND DATA SETS

Many people now use the Internet and the World Wide Web for information, facts and factoids. Are the 'Net' and the 'Web' merely spectres raised by hype wherein dwells much data, little information and less wisdom, and within which time and money are consumed? Or will they change the way scientists "tell our stories", or transfer our knowledge, to the layperson? Are we, whether professional Society or individual scientist, taking advantage of these electronic oppportunities to disseminate reliable information on those topics about which we are knowledgeable?

The concerned general public asks for information on many topics. For example, drug and pesticide safety, effects of environmental chemicals on the human reproductive system, chemical causes of cancer,

pollution and asthma, chronic effects of accidental human exposure to pesticides, multiple chemical sensitivity, dopa and nicotine interaction for Parkinsonism and Alzheimer's disease, bovine somatotrophin and milk, fluoride or mercury and teeth, air quality and human health, or genetic engineering. Please add to this short list of topics, based on your own experience.

Yes, there are 'Web' sites offering reliable information on at least some of these topics, and some which do not. There's an old adage "*in the land of the blind, the one-eyed man is king*". So, is there a role for us toxicologists to bring some light to these debates using the 'Web'?

HAVE YOU VISITED OUR STC WEBSITE YET?

It's at < <http://meds.queensu.ca/stcweb/> > and worth a visit; drop in and see us sometime....

SNIPIT: LOW LEVEL RADIATION

Can we get cancer from low level radiation? Two expert panels are taking another look. The present linear no-threshold mathematical model for the health effects of radiation implies that effects on human health increase linearly with exposure. This model has been used to control radon levels in drinking water, limits on X-rays, and exposures for nuclear power workers, scientists, laboratory technicians, and graduate students. This 25-year-old model provides a conservative estimate, as we would expect from regulators concerned to protect us. Because there is little human data on low-level effects, regulators have extrapolated the findings from the effects of exposure to higher doses of radiation. Some scientists posit that low-dose radiation stimulates DNA repair. A two-year study is underway by the U.S. National Council on Radiation Protection and Measurements to look at recent research on DNA repair. In addition, the U.S. National Academy of Sciences is forming a small panel to evaluate whether the latest data warrant a longer study on low-dose radiation.

THIRTIETH ANNUAL SYMPOSIUM - 1997

Not to rest on our collective laurels, the 1997 Scientific Program Committee (Chairman Warren Foster, Robin Walker and David Riddick) and the Symposium Committee are already hard at work on this year's Symposium. The principal theme for the 1997 meeting will be Signal Transduction. Details including the Symposium agenda and speakers should be confirmed in time for the next newsletter. In the meantime, pencil in December 4, 5, 1997 as the date of the next Symposium. The STC Symposium is consistently one of the best and most useful small meetings in toxicology each year. The 1997 meeting will be worth a priority spot on your calendar.

SNIPIT: DEATHS OF FAMOUS PEOPLE

First it was the Romans felled by chronic lead poisoning, then Napoleon Bonaparte dying from arsenic poisoning. Now it's Edgar Allan Poe (1809-1849) dying of rabies. Dr. R.M. Benitez, a cardiologist of the University of Maryland Medical Centre in Baltimore, reviewed the writer's case during a seminar on the diagnosis of difficult cases. Poe arrived at the hospital confused and lethargic, had two periods of delirium, and refused to drink (hydrophobia?) before dying a few days later. Benitez ruled out trauma, tumours, vascular or neurological problems, alcohol and cocaine withdrawal, poor nutrition and encephalitis. Hydrophobia is often associated with terminal rabies, the rabies virus attacking the nervous system and causing choking or difficulty in swallowing. Although there is no record of Poe having been bitten by an animal, only 25 per cent of people who contract rabies remember being bitten, according to the U.S. Centres for Disease Control and Prevention.

To find out more, read Dr. Benitez's article in the September, 1996, issue of the Maryland Medical Journal.

ON THE LIGHTER SIDE

A panda walks into a bar, sits down and orders a sandwich. He eats the sandwich, pulls out a gun and shoots the waiter dead. As the panda stands up to go, the bartender shouts, "Hey! Where are you going? You just shot my waiter and you didn't pay for your sandwich!". The panda yells back at the bartender, "Hey man, I'm a PANDA! Look it up!" The bartender opens his dictionary and sees the following definition for panda: "A tree dwelling marsupial of Asian origin, characterized by distinct black and white coloring. Eats shoots and leaves".

THE TOBACCO INDUSTRY AND RESEARCH FUNDING

From lung cancer to funding for the arts, the debate continues. This time the focus is on funding for scientific research in England. Senior staff at Cambridge University voted to accept a \$3 million donation from British American Tobacco (BAT) Industries. The funds will support a new professorship in international relations named after a former company chair. This decision has upset some of Britain's medical researchers. The Cancer Research Council (CRC) took a hard line by threatening to halt future funding for Cambridge scientists; currently it provides \$4 million annually. In 1995, the British Medical Research Council (MRC) accepted a relatively small grant from BAT to study the potential benefits of nicotine in people at risk from Alzheimer's disease. Both the CRC and MRC are trying to develop policies on the propriety of accepting research funds from the tobacco industry. At issue is the need for a framework that outside funding must not influence scientific research. This debate is being driven by increasing resistance to the tobacco industry; the need by the scientific community not to be seen as the siren voice for that industry; and a shortage of research funding.

Where will it end? Industrial funding of scientific research has been going on at least since I was an undergraduate in the fifties. Today, the generally negative public perception about tobacco and the tobacco industry is a major part in the discussion. Are the frameworks for reputable funding of science by

industrial sponsors open and accessible? Has the scientific community anything to share with arts communities as the latter struggle with similar issues if they accept monies from the tobacco industry? Might this debate spill over to research funding by the pharmaceutical industry? Stay tuned.

RESEARCH FUNDING

Health officials from 14 countries met in Ottawa last October to discern "Innovations in Funding Health Research in the New Millennium, trying to identify innovative ideas for funding." In general, public funding is dropping. For example, Medical Research Council of Canada biomedical research funding decreased by 3.2 per cent this year, that's \$6 million. It's enough to make a researcher worry about his or her financial health. The same scenario is found in many European countries; though France, the United Kingdom, and the United States seem to be exceptions, at least for 1997. One report suggests innovative ideas were in short supply. The linking of the benefits of medical research to demonstrable public health outcomes is confounded by the well-known effects of lifestyle and income on health. The premise behind putting money into basic research is that it benefits public health which, in turn, saves money. However, this premise is confounded by the influence of lifestyle, level of nutrition, and annual income, which can have major effects on health. Objective measurements of performance tend to be blunt rather than sharp instruments; causing one participant to wonder if economists sometimes seek too precise an answer to the question of whether biomedical research is a good investment. Another participant doubted government-funded basic research was a good financial investment, and noted that payoffs come in less direct ways, such as seeding the R&D done by industry. Countering this view, it was noted that science is creative and if one doesn't pick some losers, one is doing something wrong. One innovative idea that emerged was to turn Canadian universities into venture capitalists, armed with government funding and a slew of tax shelters. Any revenues would be plowed back into biomedical research. It would seem that research funded by this mechanism would have a commercial potential. When everything has a price, does anything have value?

CANADIAN COUNCIL OF MINISTERS OF THE ENVIRONMENT (CCME)

Of interest to those STC members working in environmental toxicology, environmental standards and objectives, or waste management, the CCME have approved in principle the Canada-Wide Accord on Environmental Harmonization, designed to lead to improved and more consistent environmental protection across Canada. The Accord and the latest versions of the inspections and standards sub-agreements are available on the CCME Internet home page at <http://www.ccme.ca/ccme> along with a CCME proposal on environmental assessment. Topics on the CCME's agenda include:

Risk-based Guidelines for Ambient Air/Waters - develop criteria and methodology for procedural guidelines;

Ground Level Ozone - Ambient Canada-wide Standard;

Dioxins and furans in all media - Discharge and Ambient Canada-wide Standards;

Particulate matter in Air - Ambient Canada-wide Standard;

Mercury in all media - Discharge and Ambient Canada-wide Standards;

Benzene in Air - Ambient Canada-wide Standard;

Total Petroleum Hydrocarbons (TPH) in Soil - Ambient Canada-wide Standard for Remediation of Contaminated Sites.

Incidentally, where do the federal and provincial Ministers of Health fit in these plans?

INTERNATIONAL UNION OF TOXICOLOGY (IUTOX)

The Society of Toxicology of Canada is a member of the International Union of Toxicology, which now has a home page on the Internet at <http://www.ehsc.orst.edu/iutox>. This web site is maintained at Oregon State University. The site provides electronic access to the IUTOX Newsletter and will serve as an information source for member societies.

NEWS FROM OTTAWA

Those who attended the AGM in December will be aware that some significant organizational changes, in the name of cutting the deficit, are currently underway in Health Canada. For those who did not attend the AGM and do not have a pipeline to the Ottawa 'happenings', I will attempt to provide a somewhat superficial chronology of events.

When Dr. A."Bert" Liston was given a golden handshake a few years ago, a retired airborne general, Kent Foster, was brought in to replace him as the Assistant Deputy Minister (ADM) for the Health Protection Branch (HPB). Concurrently, several MBAs and lawyers were brought "on board" for various managerial and/or advisory positions within HPB and in the Minister's office. In short, the Minister for Health Canada did not have a single scientist in his immediate cadre of advisors during the tenure of Kent Foster; a somewhat unique situation for a Ministry that claims to be a "science-based" department.

In February of 1996, Kent Foster resigned and Dr. J. Losos, the Director General for the Laboratory Centre for Disease Control (LCDC), was appointed as the Acting ADM of HPB. (LCDC along with the Food, Drugs and Environment Directorates constitute the research directorates of HPB). In October, 1996, all of the vivarium personnel were assembled and informed that, as of March 1, 1997, they would all be getting surplus job notices. While this announcement was driven by the fact that this division's budget had been reduced by 90% from the previous fiscal year, a secondary consideration for the announcement

could have been that the Early Retirement Incentive (ERI) program being offered by the department was grossly below the anticipated "subscription" level. As the Food, Drugs, Environment and LCDC Directorates all use animals for their research endeavors, it was obvious what announcements were to follow. Without going into detail, it was subsequently determined that the decision to drastically reduce the Animal Resources Division budget was made during the tenure of Kent Foster and seemingly discovered only after his resignation.

On November 21st, Mr. D.M. Michols, the Director General of the Drugs Directorate, assembled Drugs Directorate personnel to describe his evaluation of "Resource Shortfalls and Organizational Changes". In the memorandum given to all staff members, Mr. Michols indicated that the Cost Recovery Initiative was not keeping up with the *"negative impacts of the programme reductions going on across Government....As a first step, we have decided to examine the impacts of ceasing in-house pharmaceutical laboratory research....We believe that significant cost savings could be obtained if we met the challenges of regulating pharmaceuticals by requiring necessary research to be done by pharmaceutical manufacturers or contracted (sic) it from other Health Canada, academic or commercial laboratories....While pharmaceuticals will continue to be an important part of the therapies available to Canadians, increasing use will be made of biologic drugs. We believe that the biologics area is now the cutting edge of regulatory science and a niche particularly relevant to Canadian Industry....We will design a new office of scientific support to continue and to enhance a number of current BDR (Bureau of Drug Research) responsibilities We would therefore not be eliminating our ability to obtain scientific information and the results of research, only ceasing to undertake our own laboratory research"*.

While Mr. Michols went to great lengths to indicate to staff and the news media that he was only outlining a proposal, his memorandum goes on to describe the staffing and other alternatives available to BDR employees and "By February 1st 1997, I would like to have in hand a plan for the disposition of all employees...By April 1st, I would hope to have the new structure in place". From the Ottawa Citizen Nov. 22, 1996 - *"Health Canada's drugs directorate is proposing to close its pharmaceutical laboratories and contract out its in-house research to universities and the private sector...He (Mr. Michols) said getting out of in-house pharmaceutical research could generate 'significant costs savings' if projects were contracted to other Health Canada labs, universities or commercial labs. The bureau now runs on a \$5-million annual budget and Michols hopes to trim as much as \$3 million from it by spring"*.

It should also be noted that many national drug regulatory agencies are becoming more competitive regarding the assessment time for new drugs. For example, Sweden, France and the U.K. have new agencies whose sole objective is to reduce assessment time now that the drug industry is paying for each drug assessment. Coincidentally, the Health Canada Drugs Directorate now lists the drug industry as one of its clients as it attempts to match the drug assessment time of its sister European regulatory agencies.

Subsequent to Mr. Michols' announcement, a motion was passed at the STC Annual General Meeting that the STC President should send a letter to the Minister of Health Canada, The Honourable David C. Dingwall, expressing STC's concerns "regarding the proposal to discontinue all pharmaceutical research as a cost-cutting measure". This letter was sent about mid-January, 1997.

Concurrent with these activities, Paul Hough, the Executive Director of the Canadian Federation of Biological Societies (CFBS), met with Minister Dingwall on December 6th to discuss "Health Research". Among other items discussed, Paul asked the Minister if he would consider a proposal for reorganizing the Department's research functions along the lines of a research institute, in addition to various other infrastructure proposals that had already been put forward by his senior managers. Mr. Dingwall answered affirmatively. Subsequently, Paul met with several senior HPB scientists who put together a concise 5 page proposal that is now in the hands of Minister Dingwall. In short, Paul's proposal suggested that all HPB research be put in one consolidated and enhanced multidisciplinary research branch to be headed by a recognized scientist who would also be the science advisor to the Minister. The Branch would have a Research Advisory Board consisting of representatives from universities, industry, consumer groups, and possibly from the Medical Research Council. In addition, there would be three Bureaux - one dealing with Risk Assessment, consisting of surveillance, epidemiology and biostatistics; a second consisting of laboratory Research and Analytical Services which would contain such core services as chemistry, toxicology, etc; and a third Bureau of Extramural Research and Technology Transfer. However, it should be pointed out that such a major reorganization will not come about until after smaller activities have been completed, such as the elimination of the BDR. Consequently, some of these entities may have to be reconstituted when the dust finally settles and the ultimate configuration of science research within HPB "emerges".

The results of all these concurrent activities are unknown at this time. Personnel working in the vivarium will not receive any paper work until April 1st, 1997, but it appears that an overwhelming majority of the research scientists within the BDR are or are about to be reassigned before March 31, 1997. However, the technical staff who are not eligible for the ERI program may not be as fortunate. If you would care to write to the Minister of Health Canada, his address is given in our President's Editorial on page 4 of this issue.

RESULTS OF A SURVEY OF MEMBERS WHO DID NOT ATTEND THE 1995 ANNUAL MEETING/SYMPOSIUM Compiled by D.L. Arnold

Four questions were asked, and 104 useable responses were received.

Question 1. *Rank reason (s) for nonattendance, 1 (one) being the principle reason, 2 (two) the next most important, etc.*

Several replies did not rank their responses. The possible reasons for nonattendance included the following, in the order listed on the survey:

a Lack of funds for registration:

1. 4 responses; 2. 9 responses; 3. 6 responses; 4. 3 responses; 6. 1 responses.

b Lack of funds for travel and living costs:

1. 15 responses; 2. 14 responses; 3. 8 responses; 4. 1 response; 5. 1 response.

c Lack of employment:

1. 3 responses; 4. 1 responses; 8. 1 response.

d Programme not of interest:

1. 15 responses; 2. 11 responses; 3. 4 responses.

One written comment that there was little ecotoxicology, *in vitro* or dermal toxicology.

e Location not of interest:

1. 4 responses; 2. 5 responses; 3. 5 responses; 4. 1 response; 5. 1 response.

f Attended other meeting of more direct interest:

1. 4 responses; 2. 5 responses; 3. 3 responses; 4. 2 responses.

g Toxicology is no longer my major area of interest or work responsibility:

1. 2 responses; 2. 4 responses; 4. 1 response; 7. 1 response.

Two written comments stated that risk assessment was their major interest.

h Professional or personal schedule conflict:

1. 39 responses; 2. 6 responses; 3. 2 responses; 4. 2 responses.

Academic conflict cited by 3 responders.

i Other reasons:

Late receipt of meeting material (2 responses);

Dropping out of society (2);

Saving for European meeting (1);

Sports injury (1); Lack of time (1);

Work part time and confined to wheelchair (1).

j Other responses suggested:

Meeting in western Canada (6 responses);

That a truly national society would move around the country (4);

Meet in Toronto (3);

Meet somewhere in Ontario (2);

Meet in Ottawa (1);

Summer meeting in Laurentians or Ontario (1);

other dates (2);

Different hotel due to poor food (1).

Question 2. What other meetings did/will you attend this year? List contains those meetings for which 3 or more respondents attended.

Meeting	No. Attending
Society of Toxicology	15
SETAC	14
CFBS	7
7th International Congress of Toxicology	5
21st Annual Aquatic Toxicology Workshop	5
American Association for Cancer Research	5
Environmental Mutagen Society	3

Question 3. Does the poster session enhance the utility of the Annual Meeting?

Yes - 76 No - 5.

Written comments stated that a prize for the best student poster should be included (1) and that the abstracts should be published in the CJPP or the Journal of Toxicology and Environmental Health (1).

Question 4. Should the Annual meeting include (a) a workshop:

Yes - 66 No - 2

Two respondents felt that workshop should be held on the weekend after the 2 day symposium and one suggested that the workshop be held on the first day.

(b) a continuing education session:

Yes - 75 No - 4.

Written comment - no need for continuing education because current format is training.

PUBLICATIONS OF INTEREST

4TH ANNUAL Reducing Emissions REPORT OF THE CANADIAN CHEMICAL PRODUCERS' ASSOCIATION

The Canadian Chemical Producers' Association, or CCPA for short, has just released their fourth annual *Reducing Emissions* report. It contains aggregate data on the actual emissions and wastes produced by their member companies in 1995, plus forecasts of the reductions they forecast through the year 2000. This report is a reflection of CCPA members' commitment to Responsible Care®, for which they must know not only the nature and volumes of their emissions and wastes, but also inform the community about them. For further information contact the CCPA Chemical Referral Centre at 1-800-267-6666 or via their web site at <http://www.ccpa.ca>. You can obtain a copy of the full report from this web site.

THE STATE OF CANADA'S ENVIRONMENT - 1996

The 1996 edition of this report has been completely rewritten. This publication provides information on environmental trends and conditions, impact of human activities on ecosystems and resources, and current efforts to protect and restore the environment. The federal government is making this publication available in three formats: the familiar print version in English or French; on CD-ROM; and access through the World Wide Web. For further information go to the DOE web site at <http://www.doe.ca> or phone 1-800-734-3232.

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA)

If your work entails knowledge of CEPA, contact the Environment Canada web site (the Green Lane) at <http://www.ec.gc.ca> or phone 1-800-668-6767 for details of this recently strengthened Act.

GUIDELINES FOR CANADIAN DRINKING WATER QUALITY Sixth Edition

The sixth edition of this useful reference has been completely revised and updated. It includes all guidelines approved as of April, 1996, plus recent changes approved by the Federal-Provincial Subcommittee on Drinking Water. Cost \$16.95. ISBN 0-660-16295-4, Cat. No. H48-10-1996E (english). ISBN 0-660-95143-6, Cat No. H48-10-1996F (français), from bookstores or the Canada Communication Group - Publishing, tel: 819-956-4800.

SNIPIT: TOBACCO

A few years ago English government authorities discovered a plot to blow up the House of Parliament. On November 5, 1605 to be precise. It was noticed throughout their trial that the conspirators were 'taking tobacco, as if hanging were no trouble to them'. Yet only in 1604 the King had energetically denounced smoking - 'a custom loathsome to the eye, hateful to the nose, harmful to the brain, dangerous to the lungs' in his Counterblaste to Tobacco.

SNIPIT: HARDSHIP PAY

The "Tsukuba allowance" was established 25 years ago to compensate Japanese scientists for the hardship of moving to the science city of Tsukuba, some 60 km from Tokyo. With about 9,800 employees each receiving an extra 10 per cent of salary, this amounts to about CAN\$75 million each year. Not surprisingly, bureaucrats are looking to terminate the Tsukuba allowance by the spring of 1999. As might be expected, employees, unions, and the local chamber of commerce are unhappy about the prospect of losing this allowance..

CONFERENCES, MEETINGS AND WORKSHOPS

1997

March 9 - 13 Society of Toxicology Annual Meeting, Cincinnati, OH. For information or registration, contact: SOT HQ by Tel: 703-438-3115 or Fax: 703-438-3113

April 13-15 Calpains: Their Role in Pathology and New Therapeutic Opportunities, Oxford, UK. Contact: Christine Merle, CPD Centre, University of Oxford, 1 Wellington Square, Oxford, OX1 3LU, England or Tel: +44 (1865) 288166 or Fax +44 (1865) 288163

April 20-25 Mid-America Toxicology Course, Kansas City, MO. Contact Curtis Klaassen, Tel 913-588-7714, or Fax 913-588-7501 or e-mail cklaasen@kumc.edu

April 23 In Vitro Metabolism and Drug Interactions, London, UK. Contact Drug Information Association, 321 Norristown Road, Suite 225, Ambler, PA 19002-2755, USA or Fax 215-641-1229 or e-mail dia@diahome.org

April 24-25 New Directions for Pharmacokinetics and Metabolism, London, UK. Contact: Drug Information Association, 321 Norristown Road, Suite 225, Ambler, PA 19002-2755, USA or Fax 215-641-1229 or e-mail dia@diahome.org

May 4 - 6 Air Quality and Public Health, Annapolis, Maryland, USA. Contact: Gail Allosso at Health Effects Institute, 141 Portland Street, Suite 7300, Cambridge, MA 02139, USA or Fax 617-876-6709 or e-mail gallosso@healtheffects.org

May 18-23 International Symposium on Poisonous Plants, College Station, Texas. Contact: Dr. Tam Garland, Dept Vet Phys & Pharm, College of Vet Med, Texas A&M Univ, College Station, TX 77843-4466, USA

June 14-18 1997 Congress on *In Vitro* Biology, Washington, D.C. Contact: Society for In Vitro Biology, at Tel: 1-800-741-7476 (U.S.A./Canada) or Fax 410-992-0949

June 15-20 1997 Gordon Conference on Mycotoxins and Phytotoxins, Henniker, New Hampshire. Contact: Dr. Wanda Haschek-Hock, Fax 217-244-7421 or e-mail whaschek@uiuc.edu

June 25-28 Eurotox '97. Contact: Prof. H. Autrup, University of Aarhus, Institute of Environmental & Occupational Medicine, Universitetsparken, DK-8000, Aarhus, Denmark

June 29-July 2 1st. International Conference of Asian Society of Toxicology, Yokohama, Japan. Contact: Organizing Committee of The 1st. International Conference of Asian Society of Toxicology, c/o PMSI Japan Ltd, Royal Bldg 12-8 Nibancho, Chiyodaku, Tokyo 102, Japan or Fax +81-3-5275-6994

July 2-5 Scientific Meeting of the European Association of Poison Centres and Clinical Toxicologists, Oslo, Norway. Contact: EAPCCT Scientific Meeting Oslo 1997, c/o Help Arrangement Service AS, P.O. Box 527, N-1301 Sandvia, Norway

Sept 13-16 North American Congress of Clinical Toxicology, St. Louis, MO. Contact: M. Thompson, Regional Poison Centre, Cardinal Glennon Children's Hospital, 1465 South Grand Bd, St. Louis, MO 63104, USA or Fax 314-577-5355

Dec 4-5 Society of Toxicology of Canada, Montreal, P.Q. (Date to be confirmed)

1998

March 1-5 Society of Toxicology Annual Meeting, Seattle Washington. For information or registration, contact: SOT HQ, Tel: 703-438-3115 or Fax: 703-438-3113

March 24-28 XVIIIth Congress of the European Association of Poison Centers and Clinical Toxicologists, Zurich, Switzerland. Contact: Prof. PJ Meier-Abt, Swiss Toxicological Information Centre, Klosbachstrasse 107, CH-8030 Zurich, Switzerland, *or* Fax ++41-1-251-88-33 *or* e-mail stic@access.ch

July 6-11 ICT VIII (International Congress of Toxicology), Chemical Safety for the 21st Century, Paris, France. Contact: Remi Glomot, Secretary-General Fax 38.87.60.00

December 4-5 Thirtieth Annual Symposium Society of Toxicology of Canada

1999

March 14-18 Society of Toxicology Annual Meeting, New Orleans, Louisiana. For information or registration, contact: SOT HQ, Tel: 703-438-3115 or Fax: 703-438-3113

December Thirty-First Annual Symposium Society of Toxicology of Canada

2000

March 13-16 Society of Toxicology Annual Meeting, Philadelphia, Pennsylvania. For information or registration, contact: SOT HQ, Tel: 703-438-3115 or Fax: 703-438-3113

December Thirty-Second Annual Symposium Society of Toxicology of Canada