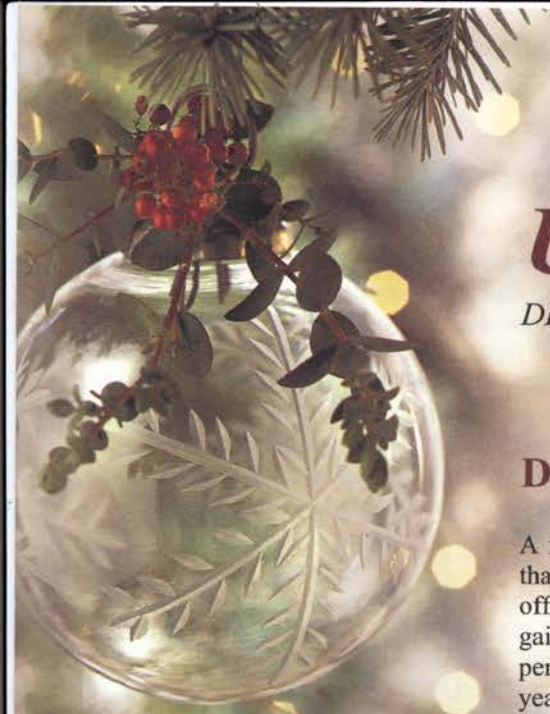

USTUR NEWSLETTER

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Direct from the Director

A few years ago, I wrote about the individuals that make up the USTUR "gang" here in the offices. Since that time, we have lost some and gained some so I'd like to introduce the new personnel that came on board during the past year.

Rob Emmel joined the USTUR as our computer maintenance engineer. Rob has a BS degree in Computer Sciences from our own Washington State University, Tri-Cities in Richland. His job is to keep our computers running, to make sure that we don't lose any of the data that was so difficult and expensive to acquire, and to help those of us who are less computer literate than he is. Rob is employed half-time with the USTUR.

Lyle Sasser is a recent retiree from Pacific Northwest National Laboratories (PNNL). He has a Ph.D. (Nutrition/Radiation Biology) from Colorado State University and he has taken on the job of modeling the intakes of plutonium, americium, and/or uranium from contaminated wounds. Lyle is also working half-time for the USTUR.

Dr. Anthony C. (Tony) James joined the USTUR in September as the new Associate Director. Tony has a Ph.D. degree in Radiation Biology from the Royal Free Hospital School of Medicine, University of London. He came to the U.S. to work at PNNL; however, he has been running his own consulting business since 1994. At the USTUR, he has been working on a new model to predict the effects of chelation therapy, which is given after relatively large intakes of plutonium and americium to increase the removal of those elements from the body. (See New Associate Director on page 3.)

One other USTUR personnel change is in the works. I, the Director of the program, am anticipating retirement next July. I will have spent nearly 35 years as a scientist and I feel as though I have done my time. That is not to say that I'll quit working because my wife of 40+ years is making a serious list of things that need to be done around the house. I will have been with the USTUR for 15 years, six of those years as the Director, and it has been great! I've met so many wonderful colleagues and I've worked with a number of very talented people as well. I feel that my success in this job is primarily because of the dedication and hard work of the USTUR staff members over the years so, to them, a big Thank You!

I offer another big Thank You to the participants in this program, having met and heard from a number of you. One thing has become very clear to me; you are all doing this because of your concern for your fellow workers in the nuclear industry. I'm happy to say that your generous contributions to this program are bearing fruit, and you will read about that in the rest of this Newsletter. A happy holiday season to you all!

Dr. Ronald E. Filipy

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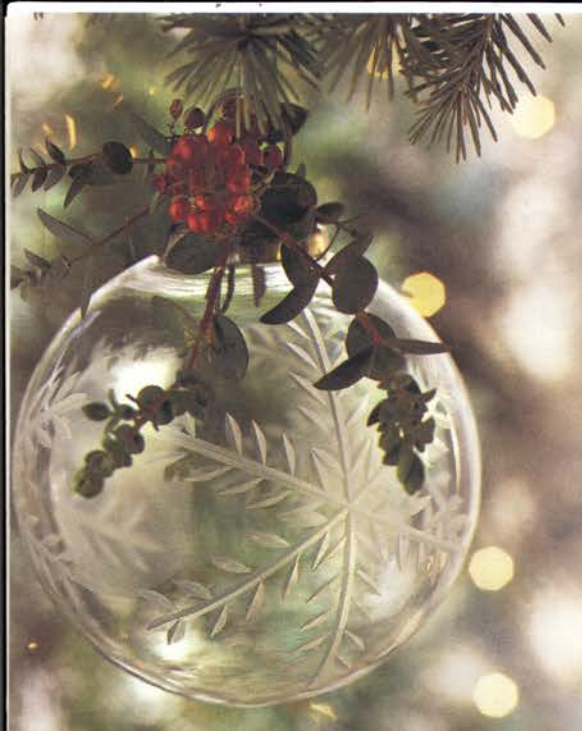

Research Developments

The USTUR is using data that you, the participants, have provided us to go "full speed ahead" in checking out the latest calculations of radiation doses that result from intakes of the actinide elements such as plutonium, americium, and uranium. Back in the 1990's, the International Commission for Radiological Protection (ICRP) proposed models (mathematical equations) that can be used to estimate intakes of those elements on the basis of bioassays. Bioassays include measurements of the amounts of the elements in urine samples and the measurements in the body or lungs with external detectors. The most common modes of intakes of plutonium, americium, or uranium are by inhalation or via contaminated wounds and the USTUR has had organ donations from a number of participants who experienced intakes by one or both of those routes.

The latest mathematical models proposed by the ICRP have been incorporated in a computer program by Dr. Tony James, our new Associate Director, working with scientists at the National Radiological Protection Board of the United Kingdom. The program, called IMBA Expert™ U.S. DOE Edition, has been distributed to many scientists involved in radiation dose calculations and we, at the USTUR, are using it to check out the accuracy of the ICRP models. We enter the results of urinalyses, whole body counts, or lung counts of a deceased individual into the computer program, and the program estimates the plutonium, americium, or uranium contents of the lungs, liver, and skeleton in that individual at time of death. Of course, we already know the answer because we radiochemically analyzed those organs, collected at the autopsy of the individual donor. The collection of all of this information by the USTUR gives us the ideal means of testing the models of the ICRP, and it is precisely the kind of activity that the founders of the USTUR had in mind way back in 1968.

It is very early to draw any firm conclusions; however, we have made some important observations, based on whole body donations (inhalation exposures) to which we have applied the ICRP models. The first observation is that plutonium stayed in the lungs and associated lymph glands longer than was predicted by ICRP models. This is because the ICRP models consider plutonium to be somewhat more soluble than it really was in these cases. Only one of the five donors died from lung cancer; however he was a life-long cigarette smoker, and his lung burden of plutonium was not especially large. Another observation about the current ICRP models is that they under-predicted the liver contents of plutonium by an average of 25% and under-predict the skeletal contents by an average of 50%, at least for older individuals. None of the five cases had liver or skeletal cancer. It is anticipated that results such as these may cause some revisions of the models by the ICRP and that is one of the main reasons that the work is underway by the USTUR.

In addition to testing existing models, the USTUR has data with which to develop new models to cover specific situations. We have had two whole body donations from former workers who experienced plutonium intakes via contaminated wounds. The USTUR is in the process of developing mathematical models to describe retention of plutonium at the wound site as well as using existing models to predict the distribution of the plutonium throughout the bodies of these two donations. This is important in that there are, at present, few reliable mathematical models to characterize intakes of the actinide elements via the wound pathway.

One situation for which there are no available models involves plutonium intake followed by chelation therapy. We are now in the process of developing a mathematical model that will describe the movement of plutonium in the body before, during, and after chelation therapy. Such a model would serve two purposes: 1) it would be used to determine the effectiveness of chelation therapy in reducing the radiation dose to the body and 2) it could be used in planning so that the chelating agent is administered most effectively in

case of an accidental intake of plutonium or americium.

So these are the kinds of activities in which USTUR faculty are currently engaged. Thanks to the generous donations of data and organ samples by our USTUR participants, we are in a position to make a real difference in the field of radiation dose modeling. This is one way in which you, the participants, are contributing to better radiation protection practices in the workplace.

New Associate Director

Dr. Anthony C. James (Tony) became the USTUR Associate Director in September, 2004. Tony earned a Ph.D. degree in Radiation Biology at the University of London and his career began with 17 years at the National Radiological Protection Board (NRPB) in the United Kingdom. In 1988, he migrated to the Pacific Northwest National Laboratory (PNNL) where he was a staff scientist in the Biology Department and, later, a Group Leader and Chief Scientist in the Health Physics Department. He left PNNL in 1994 to establish an independent scientific consulting business specializing in internal radiation dosimetry. Together with NRPB scientists, Tony developed the IMBA Expert™ internal dosimetry software, based on the latest recommendations of the International Commission on Radiological Protection (ICRP).

Dr. James has an international reputation for his expertise in radiation dosimetry and he has worked on two scientific task groups of the ICRP, one of which developed the "Human Respiratory Tract Model for Radiological Protection. He regularly contributes (as faculty) to the Health Physics Society's Summer Schools and American Academy of Health Physics courses.

Three grand essentials to happiness in this life are something to do, something to love, and something to hope for

Author unknown

The United States Transuranium and Uranium Registries would like to thank you and your family for your continued participation in the program. Sincere wishes for a holiday season filled with gentle joys, quiet pleasures and happy memories!

Registrant Statistics

Site	Number of Registrants	Average Age
Fernald	1	75
Hanford	34	78
Los Alamos	12	73
Mound	6	70
Oak Ridge	3	83
Rocky Flats	52	76
Savannah River	12	72
Uranium Mine Workers	3	83
Nevada Test Site	1	68

This table shows the number of USTUR participants from each site and the average ages of participants at those sites.
The overall average age of USTUR Registrants is 77 years and it is of interest to note that four Registrants are older than 90 years.
Maybe plutonium is not "the most toxic substance known to man" as the newspapers are so fond of stating.

Note From the Editor

The best part of this beautiful season is writing and editing this newsletter with the Director every year to keep in touch with our Registrants. This time of year inspires us to count our blessings—and dedicated Registrants, such as yourself, are among them. I hope that 2004 was a good year for you and that 2005 will be even better.

If you have an idea of something that you would like to see featured in our next newsletter, please feel free to contact us and let us know.

May your holiday season be filled with wonder!

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Visit the USTUR website on the Internet and learn more about the research of the United States Transuranium and Uranium Registries and what the data have shown.