**Randall Morin:** We have with us today seven of the most experienced and respected biosafety professionals, uh, in the world. These are true pioneers. I had the privilege of interviewing them this morning for about an hour and I can tell you they have lots of stories and lots of experiences that they would be happy to share with you. The success of, uh, this afternoon’s session will depend on an interactive dialogue between the audience and the panel. Uh, we have this room until 3:00 and I will have plenty of time for questions.

Each of these individuals has such an impressive resume that I’m not going to attempt to go over their experiences, so we have, uh, made a slide for each one and during their introductory comments, the, the slide will be on the screen, uh, giving you a few choice, uh, highlights of their careers. But, by no means are these a comprehensive, uh, compilation of their total careers.

There were three other individuals that were invited to be on the panel that could not be here. Uh, earlier this week you heard about Manny Barbeito and Joe Songer. Uh, the third individual that was to be on the panel that was not able to make it is Jerry Tullis.

I came to, uh, know Jerry while a student, a, uh, in his program at UNC, and we became, uh, very close friends and I consider him to be, uh, my personal mentor. Uh, it was a fascinating experience to, uh, spend three years with Jerry, hearing about his time at Ft. Dietrich in the early days of the, uh, biological warfare program. Uh, he then, uh, moved on to Becton Dickinson where I think he became involved in laboratory safety, and then most of you know from there, uh, he went on to North Carolina to start the biohazard science program, uh, which he then, uh, moved to Duke for a while and, uh, Jerry has since retired, but I believe still does a little bit of consulting on the side. He is a true professional, a true gentleman and, uh, a very close personal friend.

The first individual that we will invite to the podium is Dr. Emmett Barkley. Uh, Emmett has already spoken. A lot of things have been said about his career. He has a long and distinguished career of government service and, uh, I have known Emmett now for probably over twenty years. And, uh, he’s going to make a few remarks.

**Emmett Barkley:** [clears throat] Thank you Randall. Just a few comments [clears throat]. The, the discipline of biological is a dis, discipline that you can develop passion for. [Clears throat] And, I would encourage you to think of this as an exciting, exciting profession. You’re entering a time that is, in itself, not rehashing history, it’s depends on our understanding of history. Uh, I have seen through my career an opportunity to, uh, travel through, uh, challenges of working with cancer viruses, then recombinant DNA. Uh, at each step there have been new challenges that have been extraordinary, uh, a lot of fun and hard work to do. I can’t think of a more challenging time, though, than we are right today and I think it’s exceedingly important, uh, that the prof, professionals in this field uh, provide, uh, leadership in protecting not only those who work with the hazardous materials, uh, but the, uh, communities in which we serve.

I would like to say that, um, in doing that, I think one of the most important things that you can do as individuals in your profession is to partner with those you serve. And we serve all communities in our work – scientists, uh, the, the people who operate our facilities, even the community, and even the Congress. We need to have a voice in all of this, but we need to, first of all be partners with the, the community that are handling these materials that we need to, uh, enjoy, enjoy, uh, working with them.

The last thing I would say is that we need to continue to, uh, strive to be educated in the, everything that re, is related to the risks, uh, that we want to help control. And, education is beneficial by looking back at some of the historical perspectives, the background, the importance of some of the things that are, that we need to address in terms of trying to achieve biological safety. So, don’t just rely on what’s quickly available through a list serve or, or the internet, uh, for making quick and important decisions. Draw on what has been written in the, in the past until you have a comprehensive understanding of the foundation of knowledge on which this has been done. And, the field is rich with that. The early days of looking at epidemiology disease, the development of, of practices, equipment and facilities at Dietrich, the dealing with, uh, the research challenges of unknown risk. And, today, the largest one now of, of threatened bio-terrorism emerging diseases. There could not be a better time to pursue this career today. And that’s the rest of my comments.

[Applause]

**Randall Morin:** Thank you, Emmett. The next individual on our panel that will come up and talk is Dr. Schmidt, Jerry Schmidt. Uh, Jerry has, uh, been living in Texas for many years. His career has been dedicated to supporting, uh, the Country through his work at the U.S. Air force Aerospace School of Medicine in San Antonio. He was also involved with NASA over the years. And, has over 27 years of experience, uh, supporting the Air force, and has published over 80 different Journal articles and other writings.

[Applause]

**Jerry Schmidt:** Thank you very much. It’s, it’s a real pleasure to be here. I have not attended one of these conferences for the last five years. So, it’s a real thrill to come and get a chance to see a lot of the young people, uh, that I knew 30 years ago, that sort of thing.

I come from San Antonio, as, uh, has been said and, um, I worked, uh, the School of Aerospace Medicine. I was a Director for the Laboratory of Infectious Disease Research there. And, we had, uh, a new building that was built, it was, uh, what we called the hot laboratory – A containment facility at about Level 2. Uh, that was, um, practically finished before I came. I came there in, um, 1963 and we took control, uh, took over the use of the building in, uh, 1964. Um, [clears throat] um, While, um, I was there, I was asked, um, if I knew, uh, one of the people from Ft. Dietrich came down to, um, inspect the laboratory, and, uh, he said, uh, “Do you know anything about this biological safety conference stuff that’s going on, been going on?” and I said, “No, I’ve not heard of it.” And, he said, “Well, we’re having one this October,” this was in 1964, “in Ames, Iowa.” And, he said, “Jerry, I think maybe you better go to that.” He could tell that I knew very little about biological safety. And, I knew that I didn’t even know they were having these meetings. So, I went in 1964. There were about twenty people in attendance at that meeting. It was wonderful. I got to meet, uh, lots of great people active in the field, and, uh, so, that’s where my association with this group, uh, started. And, basically, I’ve been coming, except for the last five years, [clears throat] to these conferences and have thoroughly enjoyed them. Uh, four years after that one, uh, I was asked to host the conference in, uh, San Antonio. And, we had, uh, about 25 people come to that. And, then, uh, later, uh, we had another one in San Antonio, uh, in 1977, and that was the first year that we exceeded 100 attendees at the conference. So, we’ve grown a lot, and, I’ll tell you I am just thrilled with the progress and the direction that this organization is taking. It is really, uh, a thrill for me to see the International expansion of the group and the interest and so on. I think this organization is as healthy as it can be and I just look forward to reading more. I doubt that I’ll be at many more safety conferences, but, uh, maybe I will. Who knows? But, I am just so confident of the direction that we’re going and, um, that the interest is spread throughout the world, really. And, it’s just, it’s a wonderful future that I see for this organization. And, with that I will sit down.

[Applause]

**Randall Morin:**  The next individual, uh, really needs no introduction. He has been a very active member of ABSA for many years. Uh, Dr. Byron Tepper. Byron, uh, has a long career at the Johns Hopkins, uh, medical and universities. Uh, he was the Director of the Office of Safety and Environmental Health there for many years, and has also been one of the pioneers in, uh, biohazard science training. Uh, many of you are either familiar with or have attended the course that Byron’s been offering now for, I think almost, uh, thirty years, going on thirty years. So, please, uh, join me in welcoming, uh, Dr. Tepper.

[Applause]

**Byron Tepper:** Like most of you, or many of you, I came into biosafety through the back door. As you can see by this little blurb on the screen that I came to Hopkins to establish a leprosy research lab. My career before that in graduate school and post docs was dealing with infectious agents. And, so I worked with leprosy and micro-bacteria, and became Chairman of what, I think I’m proud enough to say, at Hopkins was the first IBC. The joint committee on the use of infectious agents. Over the years, as Chair of that committee, we came to realize the need for a biosafety officer. But, there were none available. The Government, Ft. Dietrich had them all occupied. And, at the same time, my grant for leprosy research was not funded. Opportunity began as I was offered the position as the biosafety officer for Johns Hopkins. Then I met all the members of this crew at various meetings, starting at 1977, and, particularly with Emmett and a meeting that he had, I believe it was in 1978, where a decision was made to provide the, where the need was established to provide training for, uh, people in biosafety. Uh, an RFP was put out, and this time I won. It was the beginning of what I consider the most rewarding opportunities that anybody could have in a career in biosafety. In that time, I’ve met over 1,400 people who were either involved in biosafety or thinking about being involved in biosafety. And, the interaction that I have had over the years has been the thing that has kept me going, particularly in the ten years since my retirement from Hopkins. And, for that I, uh, I thank all of you, and I’ll tell you now that I will continue with that teaching, uh, which, as many of you know, is modified and updated at every presentation. I will [coughs] try to keep it in, uh, in, as current as possible and, ad, offer it as more, as much as possible. Uh, and again, I say thank you for keeping me, uh, in an activity that I love.

[Applause]

**Randall Morin:** Our next panel member comes from the, uh, great State of Minnesota. He has spent his entire career – 43 years – teaching and mentoring students that have an interest in, uh, biosafety and other areas of the biological sciences. Uh, Dr. Vesley, uh, has authored over 100 publications and, as I said, has been instrumental in training, educating, and mentor, mentoring many folks who, who are now working in the field of biosafety. And, along with Jerry Tullis and, uh, Jerry Schmidt, he also, uh, worked on the NASA program. So, please join me in welcoming Dr. Don Vesley.

[Applause]

**Don Vesley:** Thank you. And, uh, I’d like to offer my, uh, to express my thanks to ABSA and to this, uh, historical committee for inviting me to this, uh, session. It’s, uh, I consider it a great honor, uh, to be on the same platform with the distinguished ladies and gentlemen to my right, uh, all of whom I think, uh, uh, extremely instrumental in, uh, the history of biosafety, the history of ABSA and have been a great source of, of strength and friendship to me, uh, over the years. Uh, when Joe, uh, sent me the letter and when I talked to him about this, he asked me to hit a couple, just a couple of things in our presentations – how we got into biosafety, a few of the highlights of our career [clears throat] and, uh, what we think were some of the challenges perhaps for the, for the future.

Getting into biosafety, I, I credit most of this, actually, to Emmett Barkley. In the mid-1960’s, Emmett and I, were both, uh, PhD students at the University of Minnesota [clears throat] under the same, uh, academic advisor, Dr. Richard Bond. And, uh, I, at the time was working on a couple of research projects, uh, which were related to contamination control. Uh, one of them was sponsored by the National Cancer Institute in providing [clears throat] uh, protective environments for cancer patients who were undergoing some of the new chemo-therapeutic treatments at the time and were [clears throat] subject or, being very susceptible to infection. Uh, that lam, it was a laminar flow concept and it was our job to monitor these systems and to [clears throat] find out whether the patients indeed could be protected. It wasn’t a completely successful thing, indeed, it proved to be too difficult, uh, to, uh, protect patients completely from environmental contaminants and they went on to other things. Uh, the other one that we were working on at the time was a contract from NASA, uh, related to the Viking program, which was the first attempt to detect life on Mars, and our job was to, uh, be able to assemble space hardware in such a way, uh, that it, uh, it could be, uh, sterilized without, uh, destroying the electronics, which had happened in earlier moon shots. And, uh, [clears throat], and be able to land on Mars and look for life without it being decided that there were a lot of , uh, skin bacteria up there.

[Clears throat] Uh, at any rate, uh, Emmett had the vision at that time, already being an employee of the Cancer Institute, that, uh, biosafety training was needed, uh, there was a lot of emphasis at that time on viral oncology, and Emmett’s concern was, uh, that, uh, we’d prove a human, uh, cancer virus existed because of infections of laboratory workers who were working with it. Uh, so he asked us to, uh, to put together these short courses in biosafety, uh, training, and they were two, three or four day courses [clears throat], uh, presented both at Minnesota and a lot in Bethesda and all over the Country. Ultimately there were 35 such courses presented. Uh, about midway through this came the Similar conference and the dawn of the biotechnology era and gene splicing, and Emmett asked us to modify this course so we could present it to the, uh, newly evolving, uh, recombinant DNA research community. And, one of the first places he sent us was to Cold Springs Harbor, uh, James Watson’s laboratory, and I as a young Assistant Professor, uh, had the honor of being able to teach James Watson how to do research. [clears throat] uh, [clears throat] there were many highlights of the career after that and one that I’d like to just emphasize is what I consider one of the new challenges in biosafety. Uh, the last thing I did before I retired four years ago was somehow to get appointed, uh, to the committee which was charged, uh, with clearing the Brentwood facility, postal facility in Washington for reuse after the Anthrax bioterrorism attacks, and, uh, our job was to determine whether the decontamination process, which was the largest one in the history of the world, uh, including eleven acres under roof and 14 million cubic feet, and our charge was to say that there were no surviving Anthrax spores in that facility. Uh, ultimately we did, and it’s too long a story to tell you how we arrived at this, but it certainly was, uh, one of the highlights.

Uh, the other thing that, uh, was asked to talk about a little bit was of what I consider, what I consider my contributions to ABSA. Well, there were just two I’d like to highlight. One, uh, I was asked to run for President three times and my greatest contribution was losing all three elections. [Laughter] [Clears throat] But, the second most important, uh, again when Emmett was President, uh, he also had the vision that ABSA needed continuing education. He asked me to head a committee to create a pre-conference continuing education program. And, there were just three of us on the committee – myself, Maryanne Sundrini and Richard Green from CDC – and it was our job to say, you know, will this work, uh, how many courses should we have, how much should we charge, who should be get to, uh, teach them, and so forth. We ended up just teaching four courses then next year, uh, at the San Francisco meeting in 1992 and it’s just tremendously gratifying to me to see how that program has grown into one of ABSA’s greatest accomplishments now with the twenty-eight courses or whatever this year, a tremendous number of people, and obviously the growing program, now International environment, and that’s all I’ve got to say.

[Applause]

**Randall Morin:**  Our next, uh, panel member is no, uh, stranger to ABSA. Um, in reviewing her background, I, I think I’m right on this, we have one thing in common [laughs], if not others, but the one thing that struck me is it looks like, uh, Diane actually started her career, uh, perhaps, uh, wanting to become a, uh, pioneer in the field of, uh, medical parasytology, but, and I did the same thing. My first graduate degree was actually in tropical medicine. Perhaps, like me, she dreamed of going to Africa and combating sleeping sickness until she realized that, you know, you have to sleep in a tent under a net and bathe in the local river. So, uh, she decided to become a, uh, clinical medical micro-biologist. But, Diane is the consummate Jill of all trades biosafety officer. She has worked at many different institutions – academic, commercial, worked as a consultant, uh, has, is a, uh, an accomplished editor and writer. So, please join me in welcoming, uh, Dr. Diane Fleming.

[Applause]

**Diane Fleming:** Wow. Thank you very much. Uh, it’s my pleasure and honor to be here. I think I’m standing on big shoulders over at this table. As a matter of fact, many of my mentors are right here. I took the Don Vesley, Emmett Barkley course at ASM back in the mid-‘70’s when I first came back to the States from an overseas assignment with my husband. And, that was my beginning in biosafety. Even though my background had been, um, in medical microbiology and immunology, in my undergraduate years, I took a course in micro that really set me off in that direction. The woman, who gave the course, Grace Blank, taught us to make our own media and to go out into nature and isolate organisms and justify anything that we had to ask for to use to stain or whatever you had to do to identify the organism. Boy, is that a way of learning micro. We don’t do that anymore. We don’t give them hands on, so you’re, you’re losing a lot in not having the old fashioned methods in some, in some capacity. Um, the other, um, mentor that’s here, of course, is Byron Tepper, because once I got established into biosafety at Wright State University. They’re the ones that sent me to take Dr. Tepper’s course. And, I was in the first group that took the NIH sponsored course in biohazard control. Lynne Harding, my colleague, was also in that course, and we’ve been friends ever since. It was a wonderful way to learn, uh, about biosafety and also to meet people to network with. And, networking is extremely important in biosafety because no one else loves you but another biosafety officer. [Laughter] So, we, uh, we really think that ABSA has done that for us as well. I know it’s getting large, but that’s one of the key things that you’re going to get out of an ABSA meeting is to learn to introduce yourself to other people, to share your experiences, and to have them as life-long friends, as many of the people here today are for me.

Um, biosafety has been very good to me. It’s enabled me to have a family, to actually learn a lot from other people. And, I can’t tell you how, even though I’ve gone to a lot of different places to do biosafety, um, let me go back a minute. I did start biosafety at Wright State, but when I went to Johns Hopkins shortly thereafter, and became their biosafety officer, that was my second experience at Johns Hopkins. I was actually there in 1959 on the faculty of the School of Hygiene and the School of Public Health in, as the lowest rung in the microbiology department. But that particular, um, mentor, um, the Chairman of the department, Dr. Barry Wood, was the one who first told me that I might be able to get a PhD because my Father did not believe in educating women because they were just going to get married. So, this was a, a shock to me that someone would think that I could get a PhD. So, Hopkins was good to me as well. But, Byron’s course was the one that took what my background was and brought it into the field of biosafety. And, you know, serendipity favors a trained mind. If you have the background for biosafety, you can learn to apply it relatively easily. If you come into biosafety without that background, you’re going to find it difficult and you’re going to have to get the background in order to do the job correctly. As Emmett was saying, you have to have that education. You have to know the subject in order to assess the risks. So, from Byron’s, um, Johns Hopkins, where I taught with him in the wonderful course in control of biohazards, and it became a one week course, eventually, once the contract was over. Uh, and we taught that for many years. And, I left there in 1988 to try to experience the pharmaceutical industry and to see how they approached biosafety. And, so I went to Sterling Drug and wrote their biosafety program and then realized they really didn’t have very many hazards and I better move on to something else. And, from there I went to, to Ft. Dietrich to the National Cancer Institute side, the FCRC and re, re-evaluated their biosafety program and rewrote some of their, uh, requirements and SOPs and enjoyed that experience as well. And I started working under the government but under a contractor. And, from there I went to, after I became President of ABSA, um, which was, in those days, you had to do everything yourself. We didn’t have a management firm. And, believe me, it was a commitment to become a member of the ABSA council or especially their President.

So, following that, I went to Merck as their corporate biosafety officer and really experienced the pharmaceutical culture. So, I had academics. I had, um, the government. And, I had the pharmaceutical field, and once I experienced the culture and found that I didn’t like the culture of pharmaceutical companies [laughing], I became a consultant. I said, oh, I’ll help you but I just can’t deal with being responsible for people not doing the things I want them to do. And, being a consultant is like that. You can go in and tell them what they should be doing, but, it’s not your responsibility to make sure that they do it. And, we’re finding more and more that the biosafety officers are being asked to be responsible for things. Um, not even, not just here, but even in government. So, over in the United Kingdom, people are being blamed for problems that are out of their control because they’re in the position of being a biosafety officer. You need to be very careful in taking on some of these, uh, responsibilities, but, uh, scapegoats aren’t a good, aren’t a good way for biosafety officers to have to respond. That’s one of the challenges that I wanted to point out is that our field has expanded so much that we’re now becoming, uh, supposedly experts in bioterrorism and threat assessment as well as in the risk of biological agents. So, um, don’t get into something you don’t think you can handle. I think we’re good as consultants. We’re good as advisory people. Uh, if you have to do the enforcement, it’s a very difficult situation to be in. I hope that all of you will learn to love biosafety as I have. It’s been a wonderful experience for me. Um, everyone on this table has been a friend of mine for a long time, and I hope for a long time in the future. I came into biosafety as sort of a second generation. Even though I was 40-44 when I came into it, so I’m a peer with these guys, um, I don’t have the background and knowledge that they had when they, um, when they taught me, is what I want to say, I guess. And, I thank you very much for that.

[Applause]

**Randall Morin:** Mary Ellen Kennedy. She is our visitor and neighbor to the North, uh, probably our closest neighbor – Canada. Mary Ellen has had a long and distinguished career with the Canadian government. Specifically, uh, at their Laboratory Center for Disease Control, which I believe is probably the equivalent of our Centers for Disease Control. Uh, Mary Ellen was the Director of the Office of Biosafety for 26 years. She was also the editor of the first and second edition of the Canadian National Biosafety Guidelines. So, please join me in welcoming Mary Ellen Kennedy.

[Applause]

**Mary Ellen Kennedy:** Well, I want to, um, thank the [clears throat] excuse me, [clears throat] the historical committee for the opportunity to, uh be here, and of course, the ABSA organization [clears throat] uh, you’ll have to excuse me. I’ve had a very bad cold, so I’m, four days ago I couldn’t talk [laughs]. Anyway, I really appreciate the opportunity to be here, and certainly to sit with these distinguished people on my, on my right. Um, I’ve had a long, um, career, in, in biosafety[clears throat], which, um started out, I graduated from Carlton University in Ottawa, Canada, and, uh, joined the public health laboratory service in the province of Ontario, which is the equivalent to your State laboratories in the United States. Um, our public health lab [thank you] um, [clears throat] was a fully, um, diagnostic, clinical diagnostic facility and I worked there for sixteen years as a microbiologist and had the opportunity to become familiar with all the aspects of clinical microbiology. Eh, in 1982, uh, the federal government of Canada, uh, decided in its wisdom, I guess, to open a new bureau at the Lab Center for Disease Control, which, by the way now, is the Public Health Agency of Canada. And, um, at the request of the Provinces of Ontario, um, opened a bureau, which they called Bureau of Infection Control, which was divided into two sections; one was, uh to deal with the hospital acquired infections in Canada and the other one was to deal with laboratory safety. And, this particular program was mandated by the Provincial lab directors across the Country who saw a need for some kind of federal direction in terms of dealing with lab safety programs with laboratory design and, of course, lab acquired infections. So, we were, uh named Laboratory Safety and I became the first, uh, director of that unit in 1983. Uh, at the time or Director General was very interested in, um, International collaboration and, of course, profile for our organization, and my mandate was not only to deal with, uh, issues of lab safety at the Provincial level, but also to develop the first Canadian biosafety, uh, guideline which was to deal with the handling and containment of infectious organisms. This sounded [laughs] alright to me at the time until I started to do it. And, I found it was a very daunting task. Um, three or four years later, we were able to publish the first guideline. And, uh, it was a very interesting process and it was very rewarding to do this. Uh, we subsequently revised the document in 1996 and, of course, because of our bilingual program in the Country, we had to have it translated into French. That was an education in itself. I’m not a bilingual person and, uh, neither was our bilingual, uh, translation department who never heard of things like biological safety cabinets and air handling systems, etc., etc. So, we had quite a, quite a challenge to translate it, uh, into French.

Um, during the course of, uh, of the program with the, uh, Lab Center for Disease Control, um, I had the opportunity to, uh, join various organizations and, uh, certainly enhanced my knowledge of biosafety, which at the beginning was very limited. I became a member of the, uh, National Sanitation Foundation, uh, Biohazard Committee for Standard, uh, Forty-Nine. I met a lot of people on that program, and actually I am still involved in that. And, then I became, um, also a technical advisor for our Department of Foreign Affairs and became part of, um, the Canadian Delegation to the United Nations on the Biological and Toxic Weapons Convention in Geneva, and I was a technical advisor to them for fifteen years. And, that was a very interesting program because I had never been exposed, having had a science background, I was never exposed to the political background of the United Nations. And, uh, my first trip was amazing. I came home and told my husband, I said, “They can’t even pronounce the name of those organisms and their making decisions that are going to affect the world.” It was really amazing. But, it was very interesting and, uh, in the course of, um, doing that work, we were actually able to introduce, um, the first, um, issue or the first edition of the WHO Biosafety Guidelines, and I’ll mention that in a minute, as a document that was Internationally recognized and had been compiled by, um, a committee which included at the time members of the, uh, Soviet Union as well as, uh, people from America and Canada, etc. So, it was kind of a foundation, uh, for some of the, um, work that went on at the UN and that particular BW Convention later on, because it became a requirement of the Convention that each Country, um, declare annually, uh, what laboratories that they have in the Country that meet certain criteria. Since nobody could agree what a Level 4 was or a Level 3 or whatever, then eventually they adopted the WHO Guidelines definitions of containment and went forward with that. So, it was, it was a very rewarding program.

In 1983, um [clears throat] our office became a WHO Collaborating Center for, uh, at that the Appalachian that was given to us at the time was, uh, WHO Collaborating Center and Consultive Services and Applied Research and at the time we did have a laboratory attached to our offices and some of you will remember, uh, Terry Webb, who’s a former member of ABSA, and, uh, Terry did a lot of work on biosafety cabinets and containment for us at the time.

Um, our association with WHO was extremely rewarding. Um, I was a member of the Biosafety Advisory Group, uh, with them and we published the first and second editions of the WHO Biosafety Manual. We also produced a number of other documents. Uh, we did one on biosafety cabinet use and selection. Um, the actual risk group that WHO uses what came out of some of the work of that committee. And the biosafety group, together with Emmett’s people at NIH, held the first train, the trainer’s course in 19, um, 84, I believe, at NIH. And, um, that document still exists and I understand that they are looking at doing another trainer, trainer’s program.

Um, last, but not least, I was also a member of the WHO Inspection Team for the smallpox repositories in Novosibirsk, Siberia and CDC Atlanta and that in itself was quite an education. It was very rewarding. So, I’ve had the opportunity to, uh, see a lot of things and travel a lot of places, uh, in the course of being a biosafety person and, uh, I certainly encourage the young people in our audience to pursue this career and to, uh, take every advantage that they possibly can to, uh, meet other people and, uh, to collaborate and expand your, expand your horizons. I think you’ll really enjoy it. Thank you.

[Applause]

**Randall Morin:** Uh, Dr. Jonathan Ri, Richmond. Like Emmett Barkley, Jonathan has had a long and very distinguished career of government service. By my calculations, uh, he spent 35 years working for the United States Government in a variety of positions, uh, ranging from biosafety officer at Plum Island, uh, to a stint at NIH followed by, uh, a long tenure as the Chief of the Safety Office at the CDC. Uh, Jonathan has retired from government service but has continued to be active as a consultant, uh, working out of his new home in coastal North Carolina. So please join me in welcoming Dr. Jonathan Richmond.

**Jonathan Richmond:** Thanks to the organizers for considering me as the youngest member of this panel, uh worthy to be here as a, as a hysterical person. I’m sorry, a historical person. I, I think I have just been so blessed with the opportunities that have, uh, come to me over the years. Um, and part of it, I think, is serendipitous of being in the right place at the right time. And that started, I, I spent, uh, about twelve years as a research, uh, virologist at the Plum Island Animal Disease Center and I was pretty happy publishing a few papers when a virus got out of our laboratory and, uh, infected animals that were on the uh, on the island. Very much akin to the problems that [unintelligible] has had recently, if you’ve been following that story. But in the, um, aftermath of that particular, uh, event and the Congressional investigations that occurred, I was, I was asked by my Director to become a Biological Safety Officer. So, I had the opportunities over the next couple of years to attend, uh, these various training courses that you’ve heard, uh, to start attending the, the, uh, Biosafety Conferences. So, being at the right place at the right time, uh, Emmett asked me to, uh, assist in forming the nucleus and the concepts for what became ABSA. And, from the beginning, I have devoted, uh, a lot of fun hours to ABSA and as Diane, uh, mentioned, uh, when we, our turn came to be, uh, President, it was all run out of our, uh, our homes, um, uh, we actually, I enjoyed being, uh, Chair of, uh, the Biosafety Conferences the same year I was, uh, ABSA President, and the same year that I had formed the first of the, uh, affiliate chapters, uh CHABSA. So, that was a very busy year.

In the, in the, um…give you an example of an, of a much later opportunity that befell me, this, and this occurred after I had actually retired, and I was invited by an architectural firm to go to Singapore to help evaluate the design of a new patient care facility, uh, that was going to be built to take care of patients who were infected with, uh, some unknown disease. And so, I, I spent several days giving scenarios, talking to them about, uh, things that, uh, could, uh, emerge, uh, in this area of the world, and the day that we left was the day that they had, uh, the first SARS cases admitted to that very same hospital. So, by the time I got home, I had a variety of e-mails saying, “How could you predict that this is what was going to happen to us?” Over the years, and in particular once I got to CDC and had the opportunity to do some of the International travels that I did, particularly into Africa and into India and Bangladesh and some of these, these very interesting Countries, was I began to appreciate the absolute need to think about the principles of biosafety and not focus attention on was the biosafety cabinet working, did I have directional air-flow, but more, what were the practices and procedures that people were doing, and what was the principle – why did we want to have negative air pressure? What was the purpose of it? And, I came back and I talked to my staff at CDC, and that, those discussions prompted us to host the first of the CDC Biosafety Conferences. And, of course, they have been continuing every other year since then. Several years after that, I, uh, had an opportunity to go to the ABSA Executive Committee and discuss the publications that were currently being thought about. Uh, the, the first draft versions of, what is now Applied Biosafety had been produced and the, I, I was serving on a publications committee, and the, the Executive Council said, “You know, we’re thinking of writing, uh, a, a book that will be biosafety guidelines.” [Clears throat] And I, I thought to myself, well that’s interesting and I said, “Look. The Canadians have an absolutely wonderful biosafety standard, and CDC and NIH put out the BNBL. Um, why would you want to do that? Let me tell you what I think is an even better idea.” And, we talked about what eventually became the Anthologies of Biosafety, a series of books – and I hope you’ve all bought the tenth one that’s out there – but we have been able to put nearly 3,000 pages into press, uh, over the past ten years. And what, what this is doing is taking the principle that’s outlined in the standards and then giving examples of how people are making it work in their own environments. And, hopefully that that’s been a useful document, but what bothered me was going to meetings, going to conferences, listening for three days to the way things were being talked about and great slides would come up, and then going home and not having any documentation to reflect back on what was said. And, so that’s encouraged me to try to move forward and get things published.

Um, and that brings me to the, the last item that I wanted to mention here, and that is, I think, probably the biggest issue facing us, and I’m, is, is the absolute need to continue our training efforts. Right now in the United States or anywhere else in the world, we do not have, what I consider, to be a robust biosafety training program. We’ve had people who have graduated with Masters Degrees and Doctorate Degrees, uh, primarily under Jerry Tullis and under Don Vesley, in the area of biological safety. These programs really are not robust at this point in time. ABSA’s doing a great job with the, the variety of training courses, but we need to be able to have some, some longer term, uh, programs to bring our younger, uh, into the field of biological safety. On the job training is great, but the gap is, is getting bigger and bigger as we look to the next generation of people who are going to be populating, uh, our, all of our new containment labs. And the issue is, is not so much the training of biological safety officers. The training also has to go to the facilities engineers who have to operate these containment facilities, and then ultimately to the laboratorians, to the animal care people, to all of the associates and assistants that actually will be working in those labs. So, go forth and educate. Go forth and nurture. Go forth and mentor. And, go forth and be good biosafety officers. Thank you.

**Randall Morin:**  Ok. Now comes the fun part of the afternoon. This group of panellists represents probably close to 300 years worth of experience in biosafety, which is amazing because, you know, the oldest person up here is only 49, so [laughter] I haven’t quite figured that out. Um, no, seriously, I hope that their short presentations have generated thoughts in your mind and that you all have lots of questions that you would like to ask. My understanding is is that we would like you to go to a microphone, uh, state your question and, uh, if necessary I can repeat it, but more than likely it will be clear enough. You can direct it at any one panel member or you can just ask it as a general question, and any of the panel members can, um, speak up and try to answer it. There really are no, uh, topics that are off limits. Uh, the theme is past, present and future, so that pretty much opens it up to, uh, whatever topics you would like to raise. So, please, uh, stand up and ask your questions.

**Question from Audience Member, Shana Nesby:** Uh, Shana Nesby with CDC in Atlanta. I’d like to ask the panel to say a few words about the evolving terminology of biosafety itself – how did the term come into being? How did it evolve into what we call it now? And, how do you see terminology moving forward as new concepts present themselves, such as bio-security? Especially as we go into more of an International need for harmonization of terms. And, I’ll just open it up to the floor.

**Randall Morin:** Anybody want to, uh, address that issue? I think her issue, uh, revolves around the evolving terminology of biological safety versus biosafety versus, now what has sort of morphed into a combination of biosafety and bio-security and, perhaps even a terrorism preparedness role for biological safety officers.

**Diane Fleming:** Oh well. Oh. Is this thing on?

**Randall Morin:** Yes.

**Diane Fleming:** Too bad. [Laughter] Um, we, we’ve had a problem over the years. I, as I told you earlier, I came into biosafety, uh, a little later than some and, um, and I’ve still had the problem. Some people call it biological safety, some people call it biosafety. We have a definition of what a biohazard is and, more or less, what we think is covered by biological safety, and yet, I still hear people referring to chemicals like nanotechnology as being biohazards and they are not. And, so we’re going to have to have a definition. And, I think every ten years or so, maybe we’ll have to redefine it as to what’s covered in our field and what may be covered by industrial hygienists or toxicologists or, I mean they have fields too. We don’t have to do it all. Ok. [Laughs]

**Jonathan Richmond:** Diane, I would agree. Um, eh, biosafety, uh, if, if I’ve, several times I’ve had people ask me to define biosafety and each time it seems to come up a little bit differently, but I think that reflects the changes that are going on. What I actually see is an even more difficult definition is the term bio-security because if you, if you look into other fields, you find that they use the term bio-security already for certain events, certain activities. Um, and, and I think that that’s going to be one that will cause us more, uh, difficulties into the future. But, I would agree with you completely that, that, the, what we are trying to do is to protect ourselves against the living, uh, in quotes “organisms” as, as opposed to the, uh, and the toxins, as opposed…well some toxins are living, come from living organisms, um, rather than the, the, the thinking of the person as being the biological entity that’s at hazard from, say, the radiation.

**Randall Morin:** Please.

**Question from Audience Member, Rob Wyant:** Hi. My name is Rob Wyant and I’m with, uh, Centers of Disease Control and Prevention and, um, over the next year or so, the, uh, United States Government is really going to be grappling with assessing the risks associated with the expanding field of synthetic biology and synthetic genomics and, and, um, in the last couple of days, in, in listening to, to, to you folks speak and other talks at this meeting, I see a lot of parallels between where we’re at now and the, the Alsilomar Conference. When, when, I think a lot of you folks were involved in assessing the risks of recombinant DNA technology. I’d like to hear your thoughts on approaches that, um, we should be thinking about at the Federal level as, as we look at this field there’s a lot of unknowns, a lot of variables out there, but we’re going to be expected to provide some guidance in terms of risk assessment and, and potential hazard control. Thanks.

**Emmet Barkley:** [clears throat] Le, let me start the, the response. Uh, I think synthetic biology is, uh, basically an extension of recombinant DNA technology. And, I am pleased to, uh, to know that the people who are, who have kind of, uh, served as the, uh, creators of that, that field The Vitner Group and, and others, uh, have been sponsored to really look at the potential risks in a very thoughtful way, in a dela, deliberate way, uh, to, to try to address that, that field. Uh, I think they find that, uh, it has a great deal of similarity in terms of the, their approach for, uh, looking to the future, uh, that we saw during Alsilomar and the recombinant DNA. So, it seems to me that, uh, there, there’s a great deal of, uh, work underway to try to, uh, look to the risks, that, uh, that, that field might, uh, uh, play. Uh, [clears throat] so I’m less concerned about the, uh, the biohazards that might be, uh, uh, associated with the field, uh, than I am about the societal application of that technology and where that will go. Uh, and so I think they’re, they’re, they’re very, they’re broad issues there and it, it’s, uh, in one way it’s kind of exciting because it, uh, uh, adds another dimension to this growth of our, our field and it, uh, demands a partnership for the much broader community in making, uh, uh, decisions of its future use.

**Jonathan Richmond:** I, I would like to add, uh, to that a couple of thoughts. Um, first is that I think that the role of the Federal Government, um, needs to be that of producing guidelines, uh, and I think the, the model is the same one that Emmett just made reference to with the, uh, first with the recombinant DNA guidelines and then eventually with the guidelines that have been produced, uh, through the, uh, BNBL. And, rather than having more regulation, I think, I’m not sure that regulation at all is the way to go in biological safety. Um, having, having said that, I’m also very concerned about the current state of the press at the moment and their seeming, unending presence trying to ferret out accidents and incidences and trying to make this a massive issue. And, the thing that, that I reflect back on is a, is a conversation or a comment that I heard, um, um, many years ago and Carl Johnson, who was one of the first people to work in the CDC Level 4 laboratories. And, Carl’s challenge to the biosafety community, as it was at the time, was we need to be able to have a very, very good method for looking at the laboratory acquired infections, the accidents that occur in laboratories, and even the near misses, and challenged us - this is some 30 some years ago – to assemble that information so that we, as the biosafety professionals, can have a chance to look at those and figure out was this truly an accident versus is there a systemic problem. So, a continuation of the kinds of questions that, uh, Dr. Wedum, uh, posed, uh, back in the, in the 1940’s.

And then finally the third thing, um, I, I have always admired the scientists who were present at the Alsilomar Conferences, um, that they the personal responsibility to be able to say, “Time out. We don’t know where we’re going with this. Let’s find out the risk, let’s find out the potential outcome, uh, before we proceed.” And, I’m not sure that I’m seeing that same level of, uh, personal responsibility, uh, being exhibited, uh, at the moment. And, so I have concerns, uh, about the direction that, again, society has moved us.

**Randall Morin:** Ok. I think we’ll go over here…

**Diane Fleming:** Could I, Can I just continue with answering that question. I was involved in one workshop, uh, that, uh, for the synthetic genomics and I was very impressed with the fact, ‘cause this went on over a two year period and they had their sort of wrap-up workshop last December and we were expecting to have some kind of, uh, document come out from the Vitner Institute and Sloan Group that, that funded it and I saw the researchers that are actually working with synthetic genomics express their concern about the relative risks that they might be putting themselves at and their families at. I saw the concern of the manufacturers that put the [unsure of word] nucleotides together, uh, that they’re being given genetic maps and putting things together and they don’t know what they’re putting together. And, I saw the overall group give us a sense of public responsibility in that they were trying to come up with reasonable ways in which they could assess the risk and protect the people. So, I am not concerned because I know they’re working on it. And, I also know that the NSABB is supposed to be providing some guidelines.

**Donald Vesley:** Just [clears throat] one other brief comment on this, going back to the 1976 recombinant DNA guidelines. Remember that they applied only to laboratories which were receiving federal funds, which included, of course, mostly universities. And, I found, at the time, it was rather interesting that even though industry, which was getting into this field in a big way, were not, uh, actually required to follow those guidelines. They followed them much more closely than the universities did. University professors are, are notoriously, uh, you know, adverse to anybody telling them what to do. And, industry had great concerns about legal, uh, issues and therefore they were the ones that really established effective committees and, uh, and, and made sure they knew what they were, were doing to protect themselves legally. And, I don’t know how that applies today but, uh, certainly federal regulations would apply to industry as well as universities.

**Randall Morin:** Yeah, I, I know in our institution we have, what I think is one of the best IBC’s in the Country, and the key, uh, is not the Chair because that’s me. The key is selecting the right scientists to serve on your IBC so that it’s a peer level committee. And this will spread that culture throughout your, uh, facility or your institution. If qualified, credible, well-informed, knowledgeable, respected scientists are on your IBC, their colleagues will listen to them. They often will not listen to the biosafety officer or the Director of EHS. But, they will listen to other scientists.

Um, ok. Joe, do you have a question?

**Question from Audience Member, Joe:** Yes. Back in the day, I suppose it would be an appropriate way to start this, there were many Biosafety programs. And, as part of those programs, there was a research element. Over the years, the research element for bio, doing biosafety research has been obliterated, for the most part. What is your guidance to the future biosafety professionals that are here, since some of you actually set those research programs up originally, how we can actually reinstitute that and actually start doing what a biosafety research at the federal industry level?

**Emmett Barkley:** I’ve got some guidance for you. [Clears throat] In developing partnerships, the way you move things in this Country is you get the appropriations committee to si, the House and the Senate, uh, to address issues of how you aught to really spend your money. I think it’s an absolute, uh – well, uh, I better not, better not say it that way – I think it would be a very positive thing for this community, uh, to take the challenge to see that this becomes, um, a, a line of funding in the future. And, I would propose that that funding initially be established, uh, at, uh, Ft. Dietrich. I cannot imagine how wonderful it might be if the investment of resources and – how many four level facilities? Four or five that are going up there? – that there is not yet one government agency that has designated a commitment to develop a biological safety program that comes anywhere near, uh, to what is needed. Uh, look what, uh, Wedum and his team did with 25 members of really defining this discipline, providing the leadership for it. It would seem to me that it would be a very valuable resource to have and I would think that the, uh, with the, uh, Congressional committees now concerned about these facilities and how the resources are going to be distributed, they may be, be very well interested in hearing, uh, from us, uh, about, uh, the need for a dedicated, applied biosafety research component, uh, that would serve all of the federal agencies that are going to occupy these facilities. And I think that we could bring that to pass if we, as a collective group, uh, uh, individually and through our universities, uh, would uh, encourage the appropriations committee to uh, uh, to give some attention to that area.

**Randall Morin:**  Yeah. For those of you that may not know, uh, Emmett is speaking about a campus at Ft. Dietrich which is known as the NIBC – National Inter-Agency Biodefense Campus. Um, it will be comprised of at least three and maybe up to six different federal agencies. Uh, it will be on Ft. Dietrich surrounded by another fence. Um, the National Institutes of Health will have a, uh, a facility dedicated to the study of, of, of biosafety Level 3 and 4, uh, agents, uh, primarily, uh, using non-human primates as models for the disease process. Uh, it will essentially, as it’s been described to me, it will be a critical care hospital for, uh, non-human primates infected with a variety of diseases. The, uh, Department of Homeland Security will have a large laboratory there, essentially a bio-forensics laboratory that will also be capable of operating biosafety Level 4. Uh, the U.S. Army plans to build a new Usamriid, uh, which will, um, of course continue to do the things that Usamriid does today. The U.S. Department of Agriculture may, in fact, build a facility there. Some of that might depend on what happens to Plum Island. Um, CDC has in, indicated an interest in perhaps putting a high-containment lab there as well. So, uh, Emmett’s right. Uh, all of these agencies are pouring millions of dollars. I think the last figure I saw is that this Biodefense campus, uh, will probably cost the federal government almost five billion dollars. Um, to think that all of this money is going into the application of, uh, of the science but yet there’s no research component there at all. So, I think Emmett has a very good point. All of us can vote. All of us do have, uh, a voice and maybe it is time for us or, or time for ABSA to raise the, uh, the concern about the lack of, of, uh, biohazard research, uh, at a National level.

Mary Ellen.

**Mary Ellen Kennedy:** Um, there’s another [clears throat] uh, sort of, uh, aspect to this. Um, when we were, uh, a WHO collaborating center in the ‘80’s, um [clears throat] there was funding that came from, actually I think from the United States, which went to WHO and, in turn, was, um, fed back into the collaborating centers. And, because we had an applied research component to our collaborating center, we did receive funding from WHO to support that research. I don’t know if that exists anymore, but I do know that [clears throat] WHO was in the receipt of funding for certain activities and I think it’s wonderful that they produce guidelines and, you know, items like that and documentation. But, uh, I think there’s, uh, an aspect that they can support in terms of research.

**Randall Morin:** Well, clearly the field’s becoming or is, is now truly International [coughing from panel] and the entire globe has an interest in this field so, perhaps pursuing a venue through the WHO would be another opportunity that’s worth pursuing.

Ok, um, I can’t tell who you, oh that’s Bob, ok. Thanks.

**Question for Audience Member, Bob:** Thank you Randall. Uh, Mary Ellen, there, uh, to the best of my knowledge there are two WHO collaborating centers in the United States.

**Mary Ellen:** Yes.

**Question for Audience Member, Bob:** One is in Bethesda, and one is in Atlanta.

**Mary Ellen:** Right.

**Question for Audience Member, Bob:** It would be very interesting to ask that same question is that if there is a biosafety component in there in order to support some basic applied research. But, my comment that I’d like to make, I’d like to return for a moment to the terminology. Uh, as you know biosafety, the word biosafety is a contraction in, in the English language. And there is tremendous difficulty is not, if not only impossible, to translate this word into Russian by the Russian speaking Countries. There’s no equivalent of that word in Russia or the Russian speaking Countries right now. So, expand that to bio-security, biosurety and biohazard. And, one of my, one of my concerns is that when I do my teaching and, uh, collaborating overseas is to, right up front, define these words and acknowledge the contraction issue. But, this may very well have an impact on the path to global harmony of common practices and procedures that we’re trying to, uh, promote. The other thing is sad in the United States is that people are still hyphenating the word biocontainment and they’re still hyphenating the word biosafety. So, you know, terminology, no matter how basic it is, uh, uh, I think it is a concern. Thank you.

**Emmett Barkley:** [clears throat] Well, I think we aught to welcome English majors to help us with this as well. [Laughter] Uh, I think communications is, is exceedingly important and it’s, uh, I’m trying to think back of, of coming up with this, uh awkward title, uh, BNBL, which I can never get the B’s and the N’s and the L’s and the B’s in the correct order or the correct word. Uh, it’s probably very useful to, to look again at, the, at biosafety whether, whether it is a, uh, uh, in need of change. I, I can say that during, uh, the early days of the BNBL development, uh, uh, that we chose specifically not to use the word biohazard in any title because we wanted to be, um, we wanted to promote safety and we didn’t not want to do that by emphasizing the risk. We wanted, we were looking for practices that would, uh, um take care of that problem. So, I would, um, I would, as we try to find the word that really describes what we’re trying to do best, uh, lets make it in a very positive, uh, uh, that re, reflects that the, the achievements that we want to make, uh, in our field.

**Randall Morin:**  Any question?

**Question for Audience Member:** Yes. I just wanted to respond to the comments on the National Inter-Agency Biodefense campus on Ft. Dietrich. Um, there were several presentations last year that spoke about how years ago, in advance of the, uh, design of the campus and the building of new facilities on the campus, we stood up working groups to address biosafety, biosurety, things of that nature, and in fact, there’s a conference, um, at the end of the month with, uh, emergency medical management response for people catching their experiments. So, we have been working diligently on Ft. Dietrich coordinating across the inter-agency to, uh, set up collaborative and cooperative ventures so that we’re providing, we don’t have like six stove pipes, but that we’re working together on all of these issues. And, yes, uh, separate federal appropriations to support some of these initiatives are in the works.

**Emmett Barkley:** Thank you. How could we help you? [Laughter]

**Question for Audience Member,:** Dr. Holly and I were going to, uh, sit down and talk about some of those issues, uh, after this conference. So, uh, we’re actually in the same building now, so.

**Emmett Barkley:** Great.

**Question for Audience Member, Susan Weekly:** Hello. My name is Susan Weekly. I’m with Sandia National Laboratories, soon to be with SCIC. And, I first of all want to thank you all. I thank ABSA and especially all of you for being here and the historical, uh, committee for doing this. I have actually two questions. The first question, do you realize, did you realize at the time the impact that you would have when you met at Alsilomar and when you formed all of these groups and started doing the training? I mean, when you, when you sit here today, do you understand how much you’ve shaped our lives and how much I hope to be like you [laughs] and have a 50 year career in biosafety? Um, and my second question, also to address the International component is, is there any guidance you can give us moving forward and in funding or perspective of how to form these associations? Not, not just at ABSA and affiliates and alliances, but in regulatory oversight throughout the world? Thank you.

**Donald Vesley:** [laughs] the answer to the first question is no. [Laughter]

**Jonathan Richmond:** Uh, Susan to just to try to answer the second question. Uh, almost ten years ago, ABSA formed something called the International, um, um, Biosafety Working Group which has been, um, active now; I think they’ve held 15 or 16 meetings over the years. And, they are working very, very hard on a variety of issues such as you just raised, uh, about how we can help transfer the ideas that we have, help understand what’s going on in their particular regions, um, and how we can move forward. So, there, there is some activity in that area. Uh, we had 160 people attending this conference from other Countries. Clearly ABSA will continue to expand, uh, its involvement internationally.

**Diane Fleming:** And I think those people in other Countries also need to be aware of the regulations and directives as they’re coming about. Just as we in the United States need to be aware of what’s being promulgated and I know that ABSA sent me, uh, to testify before OSHA before the blood-born pathogen, uh, standard came out when OSHA was going around the United States to collect those kinds of statements. You also have the opportunity to write in response to, um, a proposal, and there are several proposals pending at the present time. It’s up to you to be aware and one of the ways ABSA is aware is through the technical res, resources or technical review committee. Uh, you bring it to their attention that there is something to be reviewed and commented on. Uh, or you take it upon yourself as an individual as a part of your own organization to look at that and see how it’s going to impact your organization and respond to it. And, we’ve done those things over the years and, and myself, I did that with several of the recombinant guidelines that I felt were out of date or were, um, inappropriately affecting commerce and so several of those were changed. It, the first one took me a year to do, and it meant bringing people from the CDC before the recombinant advisory committee to testify as to which classes, um, and gene, genera in the [unknown word at 1:15:12] were pathogenic because industry was handling all of these at biosafety Level 2 large scale when they could have been handling them at the lower levels at 1 or even at, uh, GIS, GILSP which is good, industrial laboratory safety practices or large scale practices. So, if you are trained and you recognize that something going on is wrong, you, you really can make a difference. You just have to keep fighting for it. And, so after several years, that was changed and only 9 organisms, 9 genera species were actually identified as being pathogenic within that whole group of many, many organisms. And, it really did save industry millions of dollars. And, the same thing basically is true of when we changed the guidelines so that they would no longer be reflecting the, um, classification of ecologic agents based on risk which was the old C, you know, the old Class 1 through Class 5? They still had those in the NIH guidelines well into the ‘90’s and they had been changed at the CDC early in the ‘80’s. So, seeing that, it takes time. It takes a little effort. But, it’s well worth it because you do have an impact when you get it done. Thanks.

**Question for Audience Member:** First, uh, I’d like to thank each and every one of you for your, uh, contributions both to ABSA and to my career as well. And I’ve, I consider each of you, uh, a friend and, uh, a mentor. My, my question, though, is what brought me into biosafety was I was a research scientist and my defining moment with one of my colleagues was growing a cell line, uh, which, uh made HTL, uh, uh, sorry, made Interleukin 1. But it was co-cultivating HTLV3 at the same time. And it, he had it done in 17 laboratories within the facility. So, everybody had to go for test, for uh, screening and testing and that’s really what brought me into biosafety. Do you, do any of you have a story like that that you’d like to share with us that opened your eyes?

**Jonathan Richmond:** Lots of war stories.

**Mary Ellen Kennedy:** Many war stories.

[Laughter from panel]

**Diane Fleming:** Plum Island is a war story [laughs]

**Jonathan Richmond:** Yeah, it’s a war story. Well, I did mention that those events at Plum that got me involved. Um, when I, I mentioned corollary to the problems at Pure Bright, um, I, I think there were a couple of, um, very big lessons that we can learn from that experience. Number one is that in both instances, we did not have, there was not enough money being pumped into the facility maintenance. So, that, that was an underlying factor in both of these events. The second was there was a major, major change in procedures that took place and it had to do with construction work that was going on outside of the laboratory. And, it, it raised in my mind the question that if you are exper.., you know we as biosafety officers look at the way we pipette things. We look at the way we inoculate animals. We look at primary containment. But, rarely in our professional careers are we asked to look outside of our laboratory environments. And, in both of those cases, if we had had, uh, somebody really looking at the potential impact of the work going on outside of the laboratory, in both cases, these events might have been, uh, um, prevented from occurring. So, the, the lesson to me is that if, if your institution is going to undergo some major construction work, it may be worthwhile bringing somebody in with fresh eyes, somebody who is not intimately involved with the day-to-day operations, simply to look at what, what the potential problems are and try to outline, uh, procedures whereby you could, you could, uh, mitigate things before they happen.

**Byron Tepper:** Uh [clears throat] one of the first, uh, experiences I had in biosafety was something that involved common sense. I had an investigator who was infecting mosquitoes with the Dangy virus and wanted to see what kind of pathology was involved, uh, in the mosquito itself. What he was doing was infecting them in, in his insectary up on the 8th Floor of the building, putting them in a cage and walking them down to his 4th Floor laboratory where he killed them and did his, uh, pathological, uh, experiments. It was one of the most simple type of things, uh, to resolve, but he hadn’t thought about it. All he had to do was take a little ether, or whatever chemical he used to kill his mosquitoes, and if they got away from him, he could pick them up with tweezers rather chasing them through a building where there are a whole bunch of susceptible people. This got more notoriety than any kind of major event that could occur in that institution.

**Mary Ellen Kennedy:** I’ll [clears throat] excuse me; I’ll add one more war story that I told this morning, actually at our taping. And many years ago when I was working with the Public Health Laboratory and rotating through the various sections, I was working in the syphlasurology [unsure of spelling]. This was a very high volume lab and, um, it was run by a very strict lady. And, at the time we used, everything was glass – glass Petri dishes, glass pipettes. You washed them. You dried them, etc, etc. And, uh, every morning [clears throat] the lady that was in charge of the lab insisted that she wash the pipettes herself, she made the Kolmar saline herself, because it had to be correct, and then she would take one glass pipette and put it in a flask of Kolmar saline and pass it around amongst us, and we had to fill up test tubes. When you finished filling up your test tubes, you would pass it on to the next guy. So, there were six of us all using the same pipette and I was grossed right out [laughs]. And, as it turned out, later on, in the same unit, one of the staff members came down with active tuberculosis. We were all skin tested and we all came up clean, but it was, it was a defining moment.

**Randall Morin:**  Mary, I think Mary Ellen; she didn’t state this, but these folks were mouth pipetting.

**Emmet Barkley:** [clears throat] I think you all will have, uh, uh, experiences like that that will motivate you further in your field because they will happen, uh, and hopefully less than in the future. Uh, I had two events that were really, influenced me in two different ways. Uh, one had to do with my, uh, my commitment to training. Uh, I started my career in biosafety as an engineer without any experience, uh, other than infections as I was growing up. Uh, and the Cancer Institute, uh, uh, after I had spent several years helping to, uh, get their laboratory safety program underway, uh, sent me to, uh, graduate school. They, they thought I would benefit from learning more microbiology. Uh, I went to Minnesota and I was clearly familiar then with some of the basic techniques and practices, uh, that were being used in the laboratory. But, I wanted to learn the techniques, the language, uh, and the methods of microbiologists and I was looking forward to my, uh, first class in microbiology and particularly the laboratory session. Uh, we were getting to the point where we were going to be handling some pathogens. Not serious ones. Uh, and, the professor was kind of, um, observing the class and how well we had learned. Uh, he noticed me as I was, uh, removing the, uh, cotton from, plug from the pipette, uh, before I started my exercise of mouth pipetting which was what we were doing in class. This was in the ‘60’s. And, um, he came over and tapped me on the shoulder and said, “That’s pretty damn poor technique.” [Clears throat] And I, I was startled by that because on the, on the wall it said, “Practice, uh, good technique.” Uh, they wanted to emphasize that. It was [clears throat] being a sanitary engineer, I knew a plug was creating resistance [laughs] and I wanted to be more efficient. I mean, people come from different, uh, points of view. Uh, but there was no question that about mouth pipetting being a bad technique, and, and I felt that, uh, we needed to have a paradigm shift in training at the basic level where people first begin to learn their experiences and I think that’s well beyond that. Uh, but I think that was why I thought the source of training needed to be uh, uh, a major component of the safety program at NCI.

The second one had to do with a very unfor, unfortunate situation of perhaps the first, uh, laboratory acquired infection of, uh, HIV. And, I was asked to, um, uh, carry out, uh, uh, uh, an investigation of that whole aspect. Uh, and it, um, it, it really hit home when, um, the conversations, with regard to, um, the person who had been infected had to be all in, um, secret without knowing who was who and, and just to sense the, um, the, the terrible disaster that this, um, event, uh, occurred and one person’s life, uh, and then finding in the investigations, uh, the multiple opportunities for exposure, uh, that were occurring, uh, in the production of HIV virus, uh, in, in, uh, major laboratories supporting, uh, uh the Cancer Institute. Events of that nature, uh, uh, emphasize, uh, more than anything else, that there is value in, in the work we do. There are people who depend upon the work we do and, from that day on, I feel that anytime that there is an issue where harm is brought, somehow we, we share some responsibility for that. Uh, we need to, uh, learn and try to, uh, uh, make it possible for, uh, these things to occur less frequently, uh, continually occur less frequently. So, you, you will all have events, uh, that will strengthen your commitment and your passion to pursue this discipline.

**Randall Morin:** I have, um, what, what might be the last question but, and that is if there is an, uh, an untoward event, an accident or, or an incident that, that, uh, that happens at the facility, um, do you think the - and, and let’s say it involves some sort of biological material, um, do you think it is a good idea for, uh, the biosafety officer to attempt to deal with the press and answer questions about what has happened or do you feel that it is better to have a public affairs person be the official, uh, or the individual that deals directly with, with the press and have you had any experiences trying to deal with media, uh, after an event? And, how did it go?

**Mary Ellen Kennedy:** I’ve had a [clears throat], excuse me, I’ve had experience in that regard. Um, coming from a federal institution, of course, you realize that you have public affairs people that are always designated – “always” underlined – designated as a spokesperson. Um, if you can create the right atmosphere with your management to allow you to, uh, dialogue with that public affairs person and get the story right, I think it’s very helpful. But, I’m very hesitant to say that because I don’t think very often they’ll let you do that.

**Jonathan Richmond:** When I was at CDC we were most fortunate in having truly an outstanding public affairs, uh program. And, we spent a fair, CDC in general, spent a fair amount of time trying to educate a cadry of science reporters, uh, giving them background in science so that they would be more knowledgeable in, in how to, un, understand what might go on, uh, in general or even in the event of an outcome. But, on several occasions, when we had some incident or other, um, I felt comfortable enough, uh, going to the press people that, that, uh, we had been working with coaching them on the, on the issue, giving them the background, and I know that I wasn’t the only one that was talking to the press officer at that point. But, they would reach out to the scientists that were involved or they’d reach out to the epidemiologists. So, by the time they actually dealt with the issue, I think they were pretty knowledgeable, uh, and, and able to field the questions, uh, in an appropriate manner.

**Randall Morin:** Uh, the reason I asked is that, uh, I’ll recount a story that, uh, will just take a moment. Uh, shortly after I arrived at the NCI Frederick, um – I think I had been there maybe a month – I was still learning my way around. Um, they had issued me a pager and I think I was off in one of the buildings doing whatever I was doing and my pager went off and I called the number and I was told to immediately come back to my office, that there was a fire. And, uh, what had happened is that one of our contractors that was repairing the roof, uh, they were using a torch and, uh, the person that was supposed to stand by and watch to make sure that no fire started after they left didn’t do that and there was, uh, wooden rafters in the attic that, apparently, were heated up enough that they began to smoulder and, to make a long story short, the building caught on fire and began to burn vigorously. This was an old WWII era wooden structure, uh, about, uh, 25,000 sq. feet. But, what happened to be inside that building was the last remaining Class 3 cabinet on the facility. And, uh, there were also about 30,000 animals in this building. And, the building rapidly began to, uh, it was, the fire started in the attic and the entire roof was involved and it slowly started moving down into the occupied areas of the building. Uh, I think about 6 different fire companies arrived on scene and they were told immediately that, that, you know, don’t go in and start spraying water in the building because we want to get all the animals out. And, they asked me is it ok for them to go in. And I said, “Yes it is, but some of these animals are, are infected, but they’re in cages which, if properly handled, you should be able to safely get the cages out of the building.” But, what I didn’t realize is that when I made that comment, I immediately had 50-60 people who began rushing in the building to go rescue these animals and it was total pandemonium. But, luckily almost all of the animals, animals were successfully, uh, rescued from the building. But, during this rescue, which was hilarious because we had, we literally had scientists stripping down to their underwear or shorts running in the building because it was very hot. It was a hot summer day. Water began to pour out of the building, it was literally a stream running down the, uh, the street, and a couple of the containers, uh, con, housing, um, these large African frogs, uh, Xenopus? Yeah. They were, uh, broken in the process and so we had frogs running down the street, people running out with rabbits, mice and rats, uh, it, it was really…. And then about that time, you know who shows up – the, the newspaper people and the press. And, it was amazing how quickly all of the management absolutely disappeared. They literally ran back in their offices and shut the door. Nobody wanted to talk to the press, and, um, I got stuck with the job and I did not do a very good job. It was, it was [laughs] not my, uh, shining light.

**Jonathan Richmond:** Let, let me just add one comment. I made some very positive statements about the press office at CDC and I hold them in high regard. But, I recall one evening, uh, there had been some issue probably, uh, having to do with an emerging infectious disease somewhere. And, they had gotten, uh, three of the senior scientists, uh, together. They were going to do a live 6:00PM news thing for CNN or somebody. And, they just, it was a beautiful, beautiful summer day and we decided that they were going to have them sitting on, on this bench that was out in front of the CDC. And, uh, there, I, I happened to be watching as, uh, I was, I was interested in the way this worked, and the guy the guy is going, “ three, two, [SFX]” and at that point the sprinkler system came on. [Laughter]

**Randall Morin:** Hope, hopefully your scientists weren’t sitting there in their lab coats on.

**Jonathan Richmond:** No, no, that’s why I was there to make sure that didn’t happen, but, uh…

**Emmett Barkley:** I think that’s a great idea that ought to be planned [laughter] [unintelligible]. One, one suggestion I would make, uh, about the press, uh, I think its, uh, you, you never want to get into a situation that you don’t feel comfortable handling and I would, I would not, uh, and, and you will know when you’re, you’re comfortable handling, handling it, but it’s also important that the, uh, that the institution you work for have confidence in you to do that, uh, because it really is a serious task of, of dealing with the, uh, with the press. And, I think the more, uh, uh, serious the issue becomes, the more important responsibility ought to be taken up at a higher lever. Uh, I would also recommend, and I would be surprised if this hasn’t already been done, its no telling, that, um, we know infections will occur. This is not a perfect world. We’ve, we’ve seen the impact of those that have occurred already among the, uh, the national biocontainment laboratories. I think that it is exceedingly important that the, those institutions develop now, if they haven’t already, how they’re going to handle that communication and by how they handle that communication, I mean writing down the words that will be used in response to the questions that can easily be anticipated, and it, and it and the person and at what level they’ll have the responsibility for making those statements. It is, uh, it’s too difficult a subject to communicate, uh, off the cuff. And it’s, uh, I think any groups, all the groups who, who have been, uh, skilled and trained and educators and speaking to the press in response to emergencies, we would really, uh, encourage you to have this plan well in advance. Uh, you could never anticipate the type of things that, uh, Randall went through, but, uh, it looks like he survived, uh, that test.

**Randall Morin:** Well, the only good thing to come out of that episode was that the very next week they, uh, created a job for a public affairs officer. So we now have [laughter] a public affairs officer. I don’t know which one of you has been waiting the longest, so, please.

Well, one of the single events in this history was Alsilomar Conference as Dr. Richardson pointed out. And, one of our members here is, uh, was there at the time. The question would be, perhaps, why Doctor, uh, Barkley was selected to go, uh, what was the history of that? And, secondly, uh, from his point of view what was the Alsilomar experience?

**Emmett Barkley:** I think I was selected to go because, uh, uh, my work, uh, at the National Cancer Institute had been really oriented towards building partnership with the scientists I was asked to serve. Uh, and, and there was confidence, that, um, that, that I was a colleague and that’s why my first remark I said it was important to establish that rapport. Uh, I was delighted to be there nonetheless. Uh, and I really, really enjoyed it. Uh, and it enabled me to, uh, bring the talent that we had within our organization, uh, to bear in, um, uh, supporting the recombinant advisory committee. And I still, uh, believe to this day that that was one of the most, um, uh, wonderful experiences that I ever had. And, I, uh, it, uh, it made me feel that, uh, the scientific community, uh, they, they know who among them, uh, they scientists would like to keep quiet, they do their best to, uh, bring the best, uh, guidance to bear, and I have a great deal of inconfi, of confidence in them. And, I think the issues that we see that are, uh, problematic, uh, are not a reflection of the community itself. Uh, so that’s, it, it was a affirmation that, um, uh, uh the world scientific community, uh, uh, in the large part, uh, truly want to do no harm and they want to, um, uh, see that their colleagues, uh, adopt that too, and, I want to help them.

**Jonathan Richmond:** Emmet, as a, as a follow on to the experiences with Iraq, um, and everything that’s, that’s going on today. Do you believe that the, that the current…is there still a need to have all the detailed, um, reporting mechanisms in place, or should we be focusing more on the, the really high end agency, agents that really, uh, have the potential for causing harm.

**Emmett Barkley:**  You, you’re talking about recombinant DNA?

**Jonathan Richmond:** Yeah.

**Emmett Barkley:** Uh, I uh, I served on the recombinant DNA advisory committees several years ago, um, and I’m still tremendously impressed with the work that they do. And, and, I would say that in, in my, uh, three year tenure, uh, uh, I did not deal with, um, uh, a single event that had to do with, uh, handling pathogens in the laboratory. Most of our work, all of our work was really dedicated to human subjects. Uh, I think, as I believe many of you do, that, uh, we’re well past the time that the guidelines need to be revised. I would say that 99 percent of the recombinant DNA work that’s done in this Country are, are on exempt experiments and have been, uh, uh, for many, many years. Uh, I don’t know why the, uh, office of technology, uh, uh, assistants, uh, what is the A?

**Panel Member:** Affairs.

**Emmett Barkley:** …. Affairs, uh, uh, have not, uh, gone about, uh, uh, looking at those, um, guidelines again. Uh, the supporting documentation that gave, uh, the uh, uh, the how to methodology in a sense of how to, how to form a committee, how to, uh, uh, decontaminate things, all, all of the practices of biosafety, uh, come to a 250 page, uh, addendum, um, was written by, um, uh, the, the group of colleagues, um, from Ft. Dietrich and NIH and others, CDC, uh, you know, that’s, that belongs, um, in our historical record, uh, display, not [laughs], not, not as an, uh, official document associated with recombinant DNA guidelines. So, I think it’s, um, I think it’s a, uh, it’s a wonderful, uh, the, the process of a, of a guideline, uh, administered by NIH among scientists, IBC as a, as a strategy to go, but I think it needs to be, uh, um, brought up to this, uh, century, uh, and the sooner the better, whether it will happen, uh, well I have any influence, I don’t know. I don’t know whether that answers the question but, it, it’s a needed change, in my view.

**Panel Member:** Thank you.

**Randall Morin:** Yeah. I would have to say as someone who, who Chairs an IBC at a large institution, we are spending an awful lot of time discussing and reviewing work that clearly, at least as far as we can tell, presents no real hazard. And, I think we, we all probably have better things to do and so, I, I would second Dr. Barkley’s suggestion that the guidelines, I think, are overdue for revision. I mean, we’re processing 25-50 protocols a month, mainly involving work with, uh, transgenic animals, but, uh, when you look at what they’re doing, there does not appear to be any hazard, so. But, it requires an awful lot of time on the part of the investigators and a lot, an awful lot of paperwork to, uh, review all of this material, so, I would agree.

**Diane Fleming:** The NIH will not revise them until you bring it to their attention and it’s up to this group to do that.

**Emmett Barkley:** You tried ten years ago.

**Diane Fleming:** I did, and it happened [laughs].

**Emmett Barkley:** Now, I don’t mean to, in any way, imply that it’s, not, uh, a valued document. It’s, uh, it’s interesting to note that, uh, uh, the, the scientist who’s, who defines the, uh, uh, experiments of risk, uh, identified two experiments that they thought should not be carried out without the full, full scrutiny of the NIH and the approval of the director of NIH. Two of those, uh, those, those two experiments are among the seven experiments of concern, uh, that we’re dealing with in the area of dual use technology. Those were anticipated by the scientists, twenty-some years ago who said, collectively, they should not be pursued to clear approval of the director through the review and approval process of, of the recombinant advisory committee. And, and, I don’t know of one experiment that would fit that those, those two, uh, uh, types of experiments that have come before the committee. There will be absolutely no question that there will be those experiments that will come before NIH in the future, uh, out of the work of the, uh, uh, the, uh, emerging infection bioterrorism program. So, there’s a lot about, there’s a lot of stuff that’s really, really great, both the process and the mechanism, the, uh, uh, collaborative activity, the assignment of responsibilities, the importance of the IBC, the role of the biological safety officer, which I think was the first one that was put in any federal, uh, document. Uh, that, that structure is sound, valid and valuable and, and certainly should be, uh, sustained.

**Randall Morin:** Ok. Over here.

**Question for Audience Member, Nanda Godera:** Hi. My name is Nanda Godera and I practice biosafety at George University. I had one comment and I have one question. And, my comment is that I’ve been practicing biosafety for less than three years and I just wanted to draw an experience. The very first time I attended chapter meeting in Maryland, I met Dr. Fleming and I just wanted to account that she perhaps is one of the smartest person I ever met in my life. I also like to [applause] I also like to thank all of you on the panel for creating such rich history and body of knowledge for starters like me. So, my question is, if you would give a single piece of advice for a starting biosafety professional like me, what would that be? Thank you.

**Diane Fleming:** My advice would be to learn your subject in depth.

[Applause]

**Randall Morin:**  Anyone else have any sage advice? [Laughs]

**Jonathan Richmond:** That’s good.

**Emmett Blakely:** I can’t think of anything better.

**Randall Morin:** Yeah. Um, you know, it was interesting when I was interviewing for the job that I first took when I got to Frederick, um, they asked me, what, what, what are you going to do as a biosafety officer? What is the most important job you’re going to have? And I and I got this sense this might be a trick question. Um, and I thought for a minute and I said, “Well, it’s to help figure out how to let the scientists do their research safely.” He said, “Exactly.” He said, “We do not want someone here who wants to put on his badge and be the safety police. That is not what we want.” And, that’s typical of most research institutions. Uh, they don’t want somebody that is strictly going to enforce the regulations at, at all costs. They want someone who will work, as Emmett said, with the scientists because I don’t think we have yet to come up with an issue in Frederick where we couldn’t allow the scientists to do what they wanted to do. We were able to figure out a way to have them do it safely. And, so, I think that’s the spirit of, of what we all should be about.

Ok, we have one more question and I think we’ll wrap it up. Go ahead.

**Question for Audience Member:**  Um, they say that if we’re doing our profession correctly, we’re invisible. And, I think most of us have experienced that at one point in our life where we feel that we, we as professionals are not getting the institution, I mean the acknowledge, acknowledgement or the resources that we need from our institutions because nothing’s gone wrong. But, as, uh, one of the, uh commenter’s mentioned earlier, we are being tasked to do more as this profession evolves. And, my question to you as the panel is to ask you to share with us your success at elevating the discipline in the role of biosafety to your institutional management and how you have done that successfully without having to have a war story to speak for you.

Um, I think the answer is the same thing that’s just been said. You’ve got to convince, uh, your superiors that what you’re there for is not to hinder research but you’re there to help it and to help these people do it. And, uh, that’s, you’re not going to get anywhere if you’re there as a policeman. So, that’s what you’ve got to convince upper management of that you’re an asset not a, not an anchor.

Randall, I’d like to take historical Chair privilege here and I’ll ask the last question.

[Laughter]

**Randall Morin:** Ok Joe. [Laughs]

**Question for Audience Member:** All of you had, were, you have had very robust careers in biosafety. Many of you know we’re associated with some of the founders: L.G. Wedum, Briggs Phillips, Ev Haynel. What would those gentlemen think of ABSA today?

**Emmett Barkley:** In, in my opening remarks, uh, at this conference, uh, I mentioned that, uh, Dr. Wedum would be absolutely, uh, just ecstatic. He would be delighted. It was, he always found, uh, the, the work and achievements of those around him were the most important accomplishments that he would ever see that he would, he would marvel at how, uh, an initiative that was set up where the conference has grown to something like this. He, he would not imagine, he’s probably smiling now, I’m sure. This is, all of them, it just, this, this is, this is amazing what this organization has done, is doing, has grown to, uh the International connection, and I, I think it’s, uh, they would be extraordinarily be, be proud of, uh, of everything that has happened in the….

**Randall Morin:** Ok. On that note, let me just conclude by telling all of you, first of all, thanks for staying and participating in the roundtable. Also, the videotaping that I mentioned, uh, that was conducted earlier this morning, where I was interviewing and allowing these folks to interact together in two small groups, it was videotaped professionally. It will be edited and put on a, uh, I guess a DVD along with the panel this afternoon, and, my understanding is that it will be made available to, uh, anyone who would like a copy. Is that correct, Joe?

**Joe:** That is correct.

Ok. Again, thank you, um Bob, are you going to come up and officially, or, um, close the conference? Ok. Our new President.

[Applause]

**Christina Thompson:** I can’t say anymore than thank you all so much. And, the 50th Biological Safety Conference is now concluded. We hope to see you all next year in Reno.