Introduction

Phil Montgomery, MLIS

00:00:17 Hi, everyone. Thank you for being here. I want to introduce Jack, my good friend. He is a distinguished geneticist, epidemiologist and international scientist. He's Professor Emeritus of Human Genetics at the University of Texas Health Science Center in Houston. He's the author of more than 400 publications, including 14 books. He is the founder of the Schull Institute, which is devoted to addressing the healthcare needs of vulnerable populations. His research career has three recurring themes: genetics of populations and epidemiology of chronic disease conditions, the creation and maintenance of research environments in which early career scientists and clinicians are free to flourish, and finally, his career-long interest in the effects of radiation exposure on the survivors of the atomic bombings of Hiroshima and Nagasaki. He joined the Atomic Bomb Casualty Commission, which is called the ABCC—and you'll be hearing that throughout this talk—he joined that in Japan in 1949, three years after it was established. Dr. Schull served on most of the major committees throughout the 20th century to quantify the effects of radiation. He has served on numerous boards and panels and held many academic positions. He has brought his considerable knowledge and intellect to numerous reports about the effects of ionizing radiation that have guided policies of the United States, the United Nations, and the World Health Organization. His accomplishments are really too many to list. In 1992 he was awarded the Order of the Sacred Treasure, Third Class, from the Emperor of Japan.
That's the highest honor bestowed on foreign non-diplomatic individuals, and the award recognizes long and honorable service to the Japanese people. So we're going to do basically a Q&A here. That will be the format. Jack, first thing, describe the major event or breakthrough in which you participated which has guided your life.

**Jack Schull, MD**

**00:02:32** The major event that guided my life was World War II. Without the Veterans Assistance Program that was instituted, the GI Bill of Rights, as it were, I probably would never have finished college. But that was just the—added enough money to make it possible to go to school. And if you went to a local university, you could stay at home and eat off your family and do all the other things that made it possible for you to go to school on an annual amount, including room and board, of less than $1,000. So that developed my career, and I was fortunate enough early on to be offered a position in Japan. And I was piqued by my association with the Army during World War II, and that started it all. And so from then on most of whatever has flowed to me as a consequence of science has come out of those initial associations.

**Phil Montgomery, MLIS**

Tell us about the ABCC and what happened there.

**Jack Schull, MD**

If I may depart from your script—

**Phil Montgomery, MLIS**

By all means, do. [both laugh]

**Jack Schull, MD**

I was going to state at the outset that this is an old-fashioned lecture. There are no PowerPoints, no slides, only talk. What I will be talking about is essentially a man and two institutions which he enriched. The person I'm thinking of is Harvey Grant Taylor. Dr. Taylor was very definitely a 20th century man. He was born in 1903 and died in 1995. This made him then a participant in a sense or at least alive through all the major events of one of the most productive and simultaneously destructive centuries in our lives. He was born in San Francisco.
He grew up in the West. He went to school—his undergraduate work was done at Stanford, and his medical education occurred at Duke University. He was early on in the history of that institution, whose founding dean was a close friend of Grant Taylor's. That dean was Wilbur Davison.

00:05:21 Dr. Taylor was a man of many parts. If you read this little book called "Remembrances and Reflections," which was an effort at a semi-autobiographical account of his life, you'll find how diverse his involvements were and remained up until his very end. He never stopped working, and he worked at almost anything that interested him. I'll try to describe some of those interests as they relate to the two institutions which were important to him and which he enriched so much. One was the Atomic Bomb Casualty Commission, and the other one was the MD Anderson Hospital and Tumor Institute. Grant Taylor came here to Houston—it must have been in 1954-1955—as Dean of the Postgraduate School of Medicine, which was primarily responsible for the management of all of the postdoctoral programs in medicine. While here, he also was involved in the Department of Pediatrics, which he chaired, and he and the staff who cooperated with him in the 1950s were responsible in part for the treatment of most of the significant advances in the treatment of childhood malignancies. One, Wataru Sutow, was responsible for the development of the chemotherapeutic method of treating rhabdomyosarcoma. The others were interested in childhood leukemia. Now, let me go to the institutions. Can you hear me?

Audience Member

We're having trouble hearing you. Can you speak a little louder?

Jack Schull, MD

I will certainly try. It's one of those unfortunate things. Once you stop lecturing, for some reason or other, you seem unable to project as you once were. I could without any mechanical aids and did lecture to as many as 600. And now—Dick Grimes, who is sitting right up here, probably has difficulty hearing me, and I'm not six feet away. But I'll try. Hold your hand up if I'm not speaking loudly enough for you to hear me. Let me tell you now about the institutions, and I will start with the first one with which Grant Taylor was associated, the Atomic Bomb Casualty Commission. If there's a single month in the entire 20th century that should be irrevocably engraved in everyone's mind, it's August 1945. That month saw the detonation of the first two nuclear devices the world has ever so far seen—in a war-like capacity, at any rate.
The damage which those two detonations rendered to the cities of Hiroshima and Nagasaki better one’s imagination even now. Hiroshima was almost totally destroyed. Nagasaki was more fortunate, largely because of the geographic nature of the city itself. It sits amidst two valleys with intervening mountains, which rise to about 1,500 feet, and that was the elevation at which the detonation occurred. So that valley—one of the valleys, the one up which the bomb did not drop—was pretty much protected, and there was very little damage in what’s called the Nakagawa River Valley. As you can imagine, Japan’s economy, physical well-being had been brutally damaged in the course of the war. And they had lost a substantial number of young men. The ostensible objective for the bombing of Hiroshima was the fact that it was the headquarters for the southern Japanese armies. Indeed, an area, which is about 50 miles long, from Iwakuni on the southwest to Kure on the southeast, was all military. Two of those cities were off limits to even the Japanese. They were available only to people with a need to know, as they now say. Hiroshima itself was a city of approximately a quarter of a million.

00:10:20 In tracking of the figures of that city in terms of the number of dead, injured or otherwise, one must retain a certain measure of uncertainty. These were wartime cities. A lot of people were transient. They were coming and going, particularly those involved in the military. Many of the young Japanese males who were drafted had been replaced by Koreans under a compulsory service program, and of course, they weren’t documented. We don’t know how many, but we estimate there were between 35,000 and 45,000 in Hiroshima at the time of the bombing. They were never censused, and so we don’t really know. The Korean government, once it became more affluent, attempted that, but it was by that time too late to really know very much about it. The same thing is true in terms of the military. Because it was a transient station, we don’t know the total numbers actually there who were exposed. Their military records, as would be natural in any army, followed them as they moved, and their military records were stored to a large extent in the Hiroshima castle, which was totally destroyed. So even the records of most of the troops were uncertain. Others we know were out on exercise programs.

So when you see the figure of 150,000 dead, that may be right; it may be wrong. And it could be wrong by as much as 50,000. The point is there were a very large number of people killed in the first—or died—in the first 30 days following the bombing. In Hiroshima everything virtually except ferro-concrete structures within two kilometers of the hypocenter were burned or destroyed in one fashion or another. This meant most of the support units that were necessary
were gone. The fire stations were burned, destroyed in many instances. And Hiroshima is built on the delta of the Ota River, and the river branches out to—I think there’s six branches. And so the city is almost a series of islands established by the recovery of land which was shallow enough to be filled. This meant obviously that it was, as they jokingly say, a city of bridges, bars, and banks. And there were—I can't say thousands—there were certainly a hundred or more bridges in the city. Most of those were destroyed because the blast moved them sideways on their pillars. And, secondly, they destroyed the circulating water system to a very large extent because they moved from island to island adjacent to the bridges themselves. So when the bridge was moved, the lines were all ruptured. Fire facilities that were available just didn’t work. So you had this concatenation of events which made things very desperate in the city.

00:13:47 Help came surprisingly rapidly, most of it, obviously, in those early days, was Japanese, either from local areas such as the cities of Iwakuni and Kure, which were not damaged by that bomb, and by national authorities who were coming in from the universities as far away as Tokyo. US participation in the studies didn't occur until after September 1 when the official termination occurred of the hostilities existing between the Japanese people and those in our own country. Once that treaty was signed—well, it wasn't a treaty—it was just a written agreement of we'll stop shooting at one another. The treaty wouldn't come until 1951. Then a large number of individuals from the United States—the exact numbers I don't recall, but it was approximately 61 or 62—they represented persons or institutions who were in one way or another associated with the fabrication of the bomb, its transport to Japan, its air transport from Saipan and Tinian where these B-29s were housed.

So you had Army, Navy, and Manhattan project all claiming the cock bird chair, to use a Texas expression, at this examination that was going to occur. MacArthur was of course the Supreme Commander of the Allied Forces and basically was the ruler of Japan at that point in time. He insisted they would work as a group, and this group became known as the Joint Commission. There was approximately 150 persons involved, 60, as I've said, roughly from the United States, and about 90 from Japan. Obviously the physical examinations and so on that were going to be conducted required the ability to speak Japanese and to understand it, and of course there weren’t a handful of American physicians who would know that, and so the actual physical examinations were often done by Japanese physicians under the supervision.

Fortunately, the prevailing influence on Japanese medicine prior to the end of World War II had been German. And German was the language used in medical schools. So most of them could
write a creditable amount of German. And so our task then was to try to understand what they had written in German or the few who understood English in the records themselves. There were, in a period of approximately six weeks, roughly 15,000 persons who were individually examined by the physicians attending this group. Their recommendations were passed on to—since this was a military collection—I should say that the head of it was a man by the name of Ashley Oughterson, who was a Professor of Medicine at Yale. He was representative of the Army. The representative of the Navy was Shields Warren, who was a Professor of Pathology at Harvard and Head of Pathology at Deaconess Hospital there. And the third person was Stafford Warren, a radiologist at that time at the University of Rochester but also a very significant figure in charge of biomedical affairs of the Manhattan Project. He was the founding Dean subsequently of the medical school at UCLA.

00:17:51 So you had the three persons who were not wanting in self—a sense of self—and so this was undoubtedly one of the reasons why MacArthur decided that the only way this would work was for them to be as a common one. They presented their findings, which were both physical as well as biomedical, to Norman Kirk who was the Secretary General of the Army at that time. His recommendations and that report went to James Forrestal, who was Dean of War—Dean of War—Secretary of War, and finally from there to Harry Truman. And Truman was the one that endorsed those recommendations that they made. The one of primary pertinence here is the fact that this group of people, ostensibly military, recommended that long-term studies be initiated as soon as practicable and that those long-term studies should be conducted under civilian auspices, not under the military. That was a very fortunate recommendation, and it was the one which I am sure led in large measure to Truman's endorsement of the recommendations. He then directed the National Academy of Sciences to conduct those studies. The problem with this was that the National Academy of Sciences had been a body initially formed to provide scientific and medical advice to the government. The National Academy of Sciences was established by Abraham Lincoln during the Civil War when apparently our presidents first recognized that there was a need for civilian insight and oversight to some of the things that were transpiring. That was the—and it still exists. It's now called the National Academies because since Lincoln's time and indeed late in this past century other branches were established.

During the first World War, President Wilson established what was called the National Research Council. And that was the operational arm under the Academies. And so when the studies
began in Japan, they were conducted by the National Research Council, which implied oversight by the National Academies themselves. A lot of problems hinged right away. The governing body was over 6,000 miles away from where the work was to take place, and the thought of mounting a program that far removed from the directorial services that would be provided was intimidating. They sent—the first thing the academy did was to send a small committee of about six people to Japan to explore the feasibility of the recommendations that had been made. They reported back and thought that it was feasible. It was going to be a hard row to hoe, but it could be done. It meant then that you had to recruit medical staff and all of the support mechanisms necessary for a major epidemiological undertaking. We didn't know what all we expected.

00:21:29 By that time we did know, however, that ionizing radiation was teratogenic, mutagenic, and carcinogenic, so any disability that fell under any of those three rubrics was fair game for the examination and for study. The group that developed in Japan came into existence on the first of April, 1947, and it was called the Atomic Bomb Casualty Commission. When it started, it amounted to a handful—ten, fifteen people were all. By 1950, when Grant Taylor was the director, there were 1,000 persons working on this project. About 900 were Japanese, and the other 100 were from the United States or Allied powers, quite a number of Australians, because they were the occupying force for the British at that time. The task of recruiting, initiating, managing the program is formidable when you think that you are asking for the most part young people, young academicians, to go to Japan for a minimum of two years to work on projects which were ill defined and without any prospects of publication because whatever might be initiated would be so much the first bite that you wouldn't have very much that was publishable.

So most of us who went out went out on the strength of the basic interest in the problems we were confronting. Mine was genetics, and from the period from 1949 to 1951 I was head of what was called the genetics program. And in the subsequent—what?—60-odd years, I've spent about 12 years of my life in Japan working in association with these people. They are—many of them are still friends who—I first met in 1949. I will, as an aside, be going back to Japan in November. I try to get there every year to renew the acquaintances with people, most of whom are now more than 88 years old. So we are about as aged a group when we gather as you can imagine. To be among 25 people, the youngest one of whom is 88, is intimidating and awe-inspiring at the same time. But then you need to know that the Japanese—you certainly
know that they have the highest life expectancy of any nation. But, in addition, you may not
know that there are 60,000 centenarians alive in Japan. That's—the U.S. is probably lucky to
have 600, and we're a population which is three times as large as the Japanese. And so they—they've done something right with their lives obviously. [laughs]

00:24:43 But now, when Grant Taylor came, he was not the first director. In fact, one of the
persons who—the very first director was James V. Neel, who was an acting director, and he was
the person who started the genetics program. And he was my boss and colleague for 30 years
almost. And he was replaced because he was an internist, but he was in the military, and they
were looking for other avenues. And the person who was selected was Carl F. Tessmer. Dr.
Tessmer died only two years ago. He was 98. He was a colonel, and since these procedures—
the operations and studies and so on—were going under the aegis of the Supreme Command
Allied Powers—SCAP, as it was known—it was—they were all military—it was useful for the
ABCC to, at that point in time, have someone of military rank large enough to be able to
interact with the powers that be in Tokyo. Jim Neel was only a lieutenant, so that wasn’t very
much clout when you were talking to mostly one and up to five-star generals.

Taylor brought to the program a sense of need. He had come from Duke University where he
had been Associate Dean and Professor of Pediatrics. As I’ve mentioned, his boss was Wilbur
Davison who had involvements with radiation prior to his position in the—at Duke University.
Grant Taylor, when he returned—when he left Japan, which was in 1953—came to MD
Anderson. He had met R. Lee Clark, and for those of you who ever had any contact with Dr.
Clark, he was a hard man to say no to. He was so enthused and so aggressively sold on the
program of the Anderson that he could have talked—I think—the devil into being a radiologist.
He convinced Grant Taylor that they needed a program in pediatrics.

At that time, the Anderson was still a very, very young organization. In a sense, R. Lee Clark was
the first really commanding director that they had. And they had brought him here from
Minnesota. He was a Texas boy, born and raised in Hereford, so he was from the High Plains.
And he retained that culture that he had lived with all of his life, I guess, until he went to the
Mayo and to the University of Minnesota for a protracted period as a surgeon. He was brought
here to develop this previously infantile organization—that’s a bad choice of words because, as
I say, there was no pediatrics—but he was the one who set about giving substance. When the
Anderson first came into existence, it was housed in some old buildings that are now—still
extant—some of them are, at any rate—along I-10. They were not where they are now. When it
was first—when the thought of it arose—they were there in the place that I've just described. They weren't—it wasn't much but a very weak aggregation of physicians interested in cancer. But then, through the powers that be locally, the Texas Medical Center came into existence on land that the Hermann family was prepared to give. And Grant Taylor was brought to that institution because of Lee Clark. Taylor established the Department of Pediatrics.

00:29:23 If you had seen the Department of Pediatrics in the late 1950s, you would have thought it was Japanese because he had brought a large number of people from ABCC—it's now called RERF—with him when he came to the institution here. The most distinguished of those was Wat Sutow, whose name I've mentioned, but some of you may be old enough—well, the students won't—to remember a pediatrician by the name of Margaret Sullivan. Margaret Sullivan also was a Duke product and had followed Taylor to Japan, and then he recruited her as well as Drs. A. Kuramoto and Sutow. Sutow was a Nisei—a very distinguished, very able person. That was the department. And he remained there throughout the remainder of his life. He retired in time. But I think by the time he retired, Lee Clark has also retired. But at any rate, Grant Taylor's enthusiasms were—almost matched those of Lee Clark so that they made a marvelous team while they were there at the Anderson.

A little bit of information—this is strictly for those of you who play trivia. Lee Clark, in addition to encouraging Grant Taylor to do many other things, had encouraged Grant to encourage John McGovern to come to Houston to practice. John McGovern was one of Grant Taylor's students at Duke, and when he finally decided to go out to practice on his own, he had consulted his mentor. And Grant Taylor strongly urged him to come here. So the rest of it is history in the sense that John McGovern has given more money to this city and to his various institutions than probably any other one if you ignore inflation. Otherwise the land that the Hermann brothers gave would beggar even the—Bill Gates' fortune. But it was a godsend. There is a—for those of you who pay attention to the newspaper here—that is, the Texas Medical Center newspaper—you will see there is an annual lectureship that John McGovern underwrote—endowed—for Lee Clark in one—in a sense but primarily. It's called the Grant Taylor Lectureship. He subsequently endowed one for Wat Sutow, too, so there is a Wat Sutow Lectureship. What else? I know I've rambled, and that was the—the problem of being so close to an institution for as many years as I have.
Phil Montgomery, MLIS

Can you tell us a little bit about what you did with ABCC in Japan with genetics?

Jack Schull, MD

00:33:10 These studies, remember, began in 1947. They still continue but in a totally different form of reference. Our concern—and in fact I should say that probably the single fear of ionizing radiation—that colored the minds of most people were the genetic effects. At that time, it was generally thought that it took a fairly substantial exposure to ionizing radiation to be carcinogenic, and so the focus was on genetic abnormalities. We didn't know in those years enough single gene defects to actually look for specific genetic disease as a means of assessing whether there had or had not been an increase, which might be ascribable to mutations, so that the study actually focused on pregnancy terminations, and it measured all of the abnormalities that can prevail when a pregnancy terminates.

So we were looking at stillbirths. We were measuring every form of abnormality that we could envisage, major and minor, and all of these were carefully recorded. We were examining about seven and a half thousand children each year in each of the two cities. And to do this, I had at my disposal a small staff—about 15 physicians—6 Jeeps, 8 public health nurses, and the drivers for those Jeeps. We were in the field seven days a week, every day from about eight o'clock in the morning until five o'clock in the evening, except for the first five days of the new year. Then we had emergency services available, but we weren't actually calling on the home. The important thing was that in those years the bulk of pregnancies terminated at home. Less than five percent of infants were actually born in hospitals. So if we wanted to see them at their earliest, before something might happen, or, if they were stillborn, what possible causes there might be, we had to be at the home if possible as shortly thereafter as we could. Most of the births at home—as I've said, terminated at home—but they were attended by midwives. Hiroshima—Nagasaki too—had approximately 150 practicing midwives. So mothers would generally be attended by a midwife, even if they went to a physician, because the physicians ran small, 10-15 bed hospitals and for the most part weren't interested in pregnancy terminations. They would have a midwife on their staff. The midwives were good, very conscientious, but obviously there were a great many subtle abnormalities which they couldn't possibly diagnose. So they contacted us immediately if the pregnancy appeared abnormal to them. And a team went to see that child as quickly as we could get them there, usually within
four to five days after the child was born. If they were not apparently abnormal, then we visited on a more leisurely schedule.

At the time, you see, what made all of this possible was that, during the war, the Japanese had instituted a ration system for food, and a portion of that ration system made provision for pregnant women. And they could, on the registration of their pregnancy, receive additional rations, roughly a rice bowl a day of food, ostensibly for the baby's purposes. However, they could register their pregnancy at any time in pregnancy, but they weren't eligible for the rations until they were 20 weeks along. So at that stage, usually that was when most women came in. They didn't bother about registering their pregnancy at the end of their—first evidence that they were pregnant.

00:37:40 That registration occurred at the city halls or at branches of the city hall, and we had insinuated our staff into those locations so that once they'd registered for the rations, they registered with us. And so we registered every one of the infants in duplicate. One copy was given to the mother. One copy we retained because it had the expected date of confinement. And so we knew approximately when the pregnancy should terminate. And then the midwife would complete the others, such as the birth weight. We provided the midwives all with scales so that they could weigh the infants. And then those messages, as I've said, came to us either by phone or by pick up, that is, we'd send out contactors to pick the contacts up. We ended up, over the six years that the program ran—it ran from April of '47, as I've said, to December of '53—we examined 77 thousand babies. And that was a monumental undertaking, particularly given the circumstances under which those examinations occurred.

Now, because we recognized that there were a host of abnormalities that you would not be able to recognize in a newborn infant—mental retardation, for example, might not be recognizable, you wouldn't see some of the visual defects because they aren't focusing that early, or anything like some of the gastrointestinal abnormalities. They wouldn't have been picked up until such time as the baby was either on soft food or probably beyond the milk stage. So we instituted a second set of examinations. It was called the nine-month examination, but actually it was made at any time between the eighth and the tenth month after the child's birth. And that was done in the clinics. And there were x-rays available and everything else, so that all of the necessary—armamentarium that was necessary to examine these children was there. That also gave us additional insight into early mortality because we would know at least those that were born alive but succumbed within the first nine months of birth, which was a
major problem. So that was the undertaking. We stopped in—as I've said—in December of 1953 after a meeting of a group of senior geneticists in the United States who, on the basis of preliminary scanning the data that we had, were persuaded that the program was too costly in time and energy to continue since it looked as though it would never actually answer the question which was of interest to us. So we terminated that program, but in a sense it didn't really end because we switched to a mortality surveillance program, which still runs, and also then, as newer and newer techniques came on line, where we could actually look at a substantial number of specific genetic loci, these were instituted. So there's been biochemical follow up of these children since about 1972. So that study continues.

Phil Montgomery, MLIS

We're running out of time, but I wanted to ask you one other thing—if you could just briefly talk about—[both laugh]—briefly—what you and Grant Taylor did as far as preserving the records of the ABCC—in three minutes or less.

Jack Schull, MD

Okay, you've got me on the horns of a dilemma. I never said anything in two words. [laughter] Even what I just said isn't two words. [laughter] I was concerned by the fact that there were—there was an archive in Japan. There was also an archive at the National Academy of Sciences. But these were ones which, under Phillip's tutelage, I have come to realize are institutional archives. And they are more protective of incentives and things like that than necessarily accurate in the give and take that goes on in the research that actually occurred. So I went along with Grant Taylor's urging. We started to collect, or encourage our colleagues to contribute their personal papers, to an institution rather than to the Academy. In fact, the Academy didn't want those papers. They only wanted institutional. So they weren't interested in the kind of give and take that went. You were led to believe, if you look at the archival records at the Academy, that every decision that was made was unanimous. I can assure you that was often not the case. And sometimes one person who was a little bit more articulate prevailed, and the rest didn't really like it. They expressed their dislike generally in their personal papers and in letters to colleagues or memorandas for understanding, and these things never went any place else. So we started collecting those, and we have the papers now. What? About 30?
Phil Montgomery, MLIS

About—close to 30 collections and about 200 feet of papers.

Jack Schull, MD

So we have the papers of both Carl Tessmer and Grant Taylor, the two initial directors. We have Jim Neel's papers. We have all of my papers. And glibness is not the only fault I have. I collect every piece of paper that goes past my office. And so they have one person's view of the strengths and weaknesses of that institution and its management. Overall I'd give it an A+, but it's not perfect, and it's made its own mistakes. So, sorry, three words. (laughs)

Phil Montgomery, MLIS

00:44:06 That's good.

Jack Schull, MD

But it is three minutes.

Phil Montgomery, MLIS

Yeah, that's good. Do we have any questions? Anybody like to comment?

Audience Member

What have you learned?

Jack Schull, MD

What have we learned?

Phil Montgomery, MLIS

Yes.

Jack Schull, MD

I think the major thing that we've learned so far is that our initial fear of an epidemic of monstrosities or premature deaths and so on didn't happen. We have—we can estimate how
big an effect could have occurred that we would miss because this is a statistical issue. We know that the frequency of congenital defects, which runs about one percent for pregnancies that persist for at least 28 weeks—and the one percent is based upon at-birth examinations—wasn’t doubled, so that we know that if there was an increase, it was small. The biochemical studies that have been underway for the last 40 years provide much more information. But even there, we don't find any intimation that there was an epidemic of mutational events. And that's utilizing information that we currently have, both with respect to the frequency of mutations in experimental situations—and you may have noticed that one of the Nobel Prizes went for chemistry. It's just been awarded to three investigators who explored the system for DNA repair.

00:45:44 And we know now that there are repair mechanisms we didn't know existed at that point in time. So a mutation may have occurred but have been repaired. Well, I was like everybody else. We were in the Philippines and being staged to invade the Tokyo area. I was with what now would be thought of as a MASH center. It was called a Clearing Company in those days. I was the chief surgical technician. And we were prepared by higher authorities for the—we were given by higher authorities—the estimated number of casualties. We were estimating fifty percent casualties in the assault waves. I was with what was then the Eighth Army. And it was the Eighth Army that would invade the Tokyo area. And the First Army from Europe was being brought over as backup. If you know the size of an army, you know we're talking about roughly a million men with all of its attachments. And when you speak of fifty percent casualties, that's not every wave, but the first several waves would have had that kind of casualty loss. Not all dead necessarily, maybe not more than twenty-five percent of that fifty percent would have been killed outright. But there'd be a lot that weren't going to make it on.

And so when we learned it was all over, we couldn't feel particularly sorry about the Japanese. I think the same thing—the reaction must have been there, much as it was in Europe when the Germans surrendered, that, God, this nightmare is gone. What was really surprising to me was, when I got to Japan and ended up—that's the only place outside the United States I can imagine living. It's that much of a home to me now. And it was those people, not—they're the ones who persuaded me. [laughs] So it was really quite something. Even seeing veterans as I did right after the war—you don't anymore—and the Japanese, obviously in their economic situation, couldn't take care of veterans—were begging. And even they would refuse any—their cups would be withdrawn. They wouldn't proffer their cups to us for a contribution of any sort.
But there was no overt antagonism. I mean, it was really quite strange. And their behavior, except, made sense. The thing that was never explained to me was, why in the hell what happened, happened? Because that was not characteristic of the Japanese that I've come to know.

**Audience Member**

What do you mean: ‘Why what happened, happened’?

*Jack Schull, MD*

**00:48:59** Well, it was still—it was a military oligarchy. It wasn't a free country. And the military oligarchy was good at—notion management, if you want. So they prevailed upon the emperor who could be the person through whom all major changes were passed and that he was God-endowed and so there wouldn't be mistakes. But the only information he ever got was from the military oligarchy because they closed him off. So it was—if you were there and you saw them in the field, the Japanese army was just as hard on its own as it often was on not its own. Something as simple as taking a bath—a big ritual in Japan—you bathed by rank. So the lowest PFC was the last one to get in this water that looked like mud. [laughs] But everything had a programming nature to it. So that's the only reason—the only thing I can think of—is they were just blindsided by propaganda.

**Audience Member**

Can you describe the impact of you—first being a soldier going in to invade, then being a scientist coming to study, then making friends and feeling at home with these people—how has that made you who you are today?

*Jack Schull, MD*

Well, I—it's done it in both overt and very subtle ways as well. I think one of the things which—with time I've come to realize how fortunate I was. I didn't speak Japanese, knew virtually nothing about the culture, and here I was supposed to be understanding of these young physicians who were going to work under me, as well as the staff, most of whom didn't speak any English. But I was fortunate enough to have a right arm who happened to be a Nisei from Hawaii whose family—his father was a Buddhist priest. He was born on the big island. His name was Koji Takeshima. And Koji was about sixteen, went back to Japan, and the family went too.
He had two sisters and one brother plus himself. The one brother was killed in the bombing. The two sisters and Koji both survived. They were far enough away. But Takeshima got his medical training in Japan. And of course he had been in the United States long enough to be fluent in English. So I had someone who both knew the culture and knew the medical culture in addition to just the other culture, if you will, and who made certain that I didn't make more gaffes than I possibly could. [laughs] But he informed me of things to do, things not to do. And they developed a camaraderie largely because they could speak to Koji. And they'd talk to me, and I was with them all the time. I didn't lead from the rear of the troops. I went—I was on the field most every day. And I can tell you, a Jeep does perpetual damage to your derriere. [laughter]

Phil Montgomery, MLIS

Okay, well, thank you very much, Jack. I think that's all we have. I appreciate it. [applause]
K
Kirk, Norman .................................................................................................................. 6
Koreans .................................................................................................................................. 4
Kuramoto, A .......................................................................................................................... 9
Kure .......................................................... 4, 5

L
leukemia .............................................................................................................................. 3
Lincoln, Abraham ............................................................................................................... 6

M
MacArthur, Douglas ........................................................................................................... 5, 6
malignancies ....................................................................................................................... 3
Manhattan project ............................................................................................................... 5
McGovern, John .................................................................................................................. 9
midwives .............................................................................................................................. 10, 11
military oligarchy ............................................................................................................... 15
mortality surveillance program ......................................................................................... 12

N
Nagasaki .............................................................................................................................. 1, 4, 10
Nakagawa River Valley ........................................................................................................ 4
National Academy of Sciences ............................................................................................ 6, 12
National Research Council ................................................................................................. 6
Navy ....................................................................................................................................... 5, 6
Neel, James V ...................................................................................................................... 8
Nisei ....................................................................................................................................... 9, 15

O
Ota River .............................................................................................................................. 5
Oughterson, Ashley .............................................................................................................. 6

R
ration system for food ......................................................................................................... 11
Remembrances and Reflections ........................................................................................... 3
repair mechanisms .............................................................................................................. 14
RERF (Radiation Effects Research Foundation) ................................................................... 9

S
SCAP (Supreme Command Allied Powers) ....................................................................... 8
stillbirths .............................................................................................................................. 10
Sullivan, Margaret ................................................................................................................................. 9
Sutow, Wataru ...................................................................................................................................... 3, 9

T
Takeshima, Koji .................................................................................................................................... 15
Taylor, Harvey Grant ............................................................................................................................ 2, 3, 7, 8, 9, 12, 13
Tessmer, Carl F. ..................................................................................................................................... 8
Texas Medical Center ........................................................................................................................... 9
Tokyo .................................................................................................................................................... 5, 8, 14
Truman, Harry ...................................................................................................................................... 6

W
Warren, Shields ................................................................................................................................. 6
Warren, Stafford ................................................................................................................................. 6
World War II ......................................................................................................................................... 2, 5