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OTIS HISTORICAL ARCHIVES

Interview w/Dr. George Schreiner of Georgetown University - 4/18/91

Present: GS - Dr. Schreiner
AN - Adrianne Noe, Curator of Historical Collections
AH - Alan Hawk, Collections Manager, Hist. Collections
MR - Michael Rhode, Archivist, Otis Historical Archives

GS: They asked me to do this for the 20th Anniversary of the American Society of Morphology to do this thing on decade by decade. They asked me to do the 50's in terms of giving a analysis of poisons I go into, the history of dialysis coming back to 1910 or so, and the earlier work of...which I won't bore you with.

: For the record, Dr. Schreiner is talking about his article "The Roaring Fifties."

GS: It's published in the *American Journal of Kidney Diseases*, vol 16, 1990, p. 520-9, but I'll just go into a little bit.

AN: Are these photos from your own collection? (the ones you used in your article?)

GS: Yes. Since the whole issue was historically oriented, I...
threw some things in there, so it is doubtful that the rapid growth of morphology in a few centers in these two areas would have occurred were not for five major factors. The first were the direct involvement in military medicine. In England, Lurke' had popularized thrush syndrome. The board for the study of the severely wounded in Italy during WWII recorded case fatality rates of 80-90% in sequence of multiple wounds followed by Algerian death. The Army had experienced acute tumorocrosis in the sperm research in Richmond and Brooks Army Medical Center and instituted a grant's program to support research on the subject. A McNeil Column's kidney was actually built on a grant from the surgeon general. The reason I know that is that I was the site visitor on grant. I'm the only person really around that's been through all this stuff, because I was here at Walter Reed at WRAIR.

AN: Did you do a lot of site visits for them? What other projects did you work at?

GS: Yes. Richmond, Brooks Army Hospital, McNeil in Buffalo, a guy in College of Providence, RI - something about a cocktail that they had of citrate potassium salts to treat urenial. I even know where he is;, he's down in Florida, Dick Nubar. I don't know whether he got the grant or not, but it was of great interest to the Army at the time, and then I did a little work with Bill Moroni who was here (WRAMC?), and was here Colonnel and had research lab. Norm Finkel who is now dead and I did the major part of the physiologic research to back up the Korean unit. I was actually offered the job to command the unit in Korea after I came back with the first view research team. We were told at the time that actually the Army had never mounted a clinical field research team directly out of Washington, that all research up to the Korean War had been done incidentally by people who were in the field, surgeons's, and what not but they never formally processed a NY

thing. It was legally titled "The First Field Research Team" so I don't know if that was true. That's what we were told at the time, that this was first at the way the Army did things.

AN: What were the goals of the Research Team?

GS: We had a whole series of projects. One was they had no feedback on the Airevac. Airevac started out very spontaneously. My concept of the history of the M.A.S.H. unit was that they got the idea between/after WWII as a result of something called the "Second Aux Surgical Team" which I believe was out of the M.A.S.H. general hospital and commanded by Dr. Churchill who was the surgeon. They tacked the Second Aux Team which was a surgical team, a very skilled surgical team, onto a field hospital, and then they began doing major surgery much closer to the front. Believe it was in northern Italy where they ended up, don't know where they started. They realized a huge benefit in terms of going directly to definitive surgery early on instead of taking people back to England. That inspired the design of the M.A.S.H. unit which was on the blueprints following WWII, and then when the Korea thing broke out, they turned it into reality for the first time. That was the first use of it. The first war trial concept of the M.A.S.H. unit. When the M.A.S.H.'s started, the helicopter was just getting into military use. In fact, they didn't even have, the Air Corps didn't even have helicopter pilots in Korea. Very few people know that. All the MEDLVAC helicopter pilots; many of them didn't even have pilot licenses. The guy that flew me around was a former filling station operator. He was terrific as a pilot. There was almost no Air Force participation. I know they wouldn't be happy to hear about that. From my point of view, at least every place I visited myself, I saw very little Air Force operation except in straight military situations. They had fighter pilots and fighter wings, but weren't participating in other kinds of air activities. In fact, the man that used to fly me up to the front every week who carried the General's orders, the actual command orders for the day. The battle orders were Greek. He was a fantastic pilot. He flew the General's plane up there and he wasn't even American. He was on loan.
AN: What year were you in Korea?

GS: 1951. My orders were very early in the year. And then we were held up here and then for a little while in Salt Lake City and Travers. That spring was during the ___ between President Truman and McArthur, and they sort of froze orders even though we had orders to go over early. We didn't actually get there until late spring after MacArthur was fired.

MR: When you were at Travers, did you have the whole blood program started yet?

GS: Yes.

MR: We have an article here in the Archives that said there were about 33 people working out of a converted kitchen, and they would only send whole blood.

GS: Yes. That is correct. I had something to do intellectually with it because we were assigned to the project long before we actually went so that we were spending part of this time learning all that we could learn. We were living up our ducks which is something you don't get a chance to do in the Army. We basically had time on our hands. I ran around a lot with Curtis Artz and with Moroni and an other fellow, and of course COL Stone was the head of WRAIR at that time and also the post-graduate medical school, and I taught in that. We were hearing about all of these projects, and we were also given unusual access to them because everybody

knew that we were going over there (to Korea). We more or less could get into anything we wanted to get into even if it was classified. We all had high-level security checks. My understanding of the blood program was that they collected at the various blood centers tilter whole blood. There was something called strength of antigens, and so they tried to get low tilter blood and either RH negative or something that tested RH negative because the test weren't real good at that time. I was incorrectly tested myself. I was said to be RH positive, but I wasn't. When we started having babies, I had my wife checked with antibodies all during pregnancy. Nothing happened because I knew she was RH negative, and I was RH positive so we were expecting Erythroblastosis. Nothing happened and her titer didn't even rise. The baby turned out to be RH negative, and then the next child came along with Irish negative; I said something is wrong because that exceeds the statistical odds. I went back and got myself re-typed and it turned out I was RH negative too, but I've been a blood donor as an RH positive. So, the serum wasn't really good at that time. It was reasonably good - 98% or something. We were using what was tested as RH negative O blood, and then it was put into these containers, cool containers, they were special boxes that were designed, and they could ship them over under refrigeration or they would hold the cold pretty well so that they were taken out of the refrigerator and put a dry ice pack on top, and they flew them to Korea and put them into the field hospitals, - first the general hospital and the field hospitals and eventually in the M.A.S.H. units, and then what was a real medical innovation. I won all sorts of bets from people betting, i.e., science teachers, medical students. One was the first war that we gave fresh blood to the wounded on the battlefield. Some say the Civil War, WWI and WWI. That was the first time it was actually done in policy was Korea, and their reason is ridiculously simple. There is no refrigeration in a battalion, nor refrigeration in the collecting station. So until the Airevac came along, there was no way you could get cool blood up to the front. There was no way for you to keep it. It was kept in the M.A.S.H. unit in the refrigerators which were setup in the lab. And, then in the morning, when the first casualties came into the battalion aid station. The battalion aid guy, if there was a doctor, fine, if otherwise, the sergeant or the corporal would call and say "send the helicopters up" as soon as it was dawn. We weren't allowed to fly in the daylight, becasue they had no counter radar equipment. We would fly up in the morning and if they already knew the nature of casualties, sometimes they flew a doctor up, sometimes we wouldn't, but we always would fly up a case of blood with chipped ice around it and keep it right in the battalion aid station and give it to the wounded as they came in. I actually flew back by the light of the moon one time. They would stretch the sunset a little far if they have a lot of wounded to try and get that last flight in. Then we would take the blood back, put it in the refrigerator and do the same thing for the next day.

AN: The system worked pretty well.

GS: The system worked very well. We actually initiated for the first time, the first in-flight intravenous infusion of concentrated albumin solution. Later we did a plug in the air.

MR: Would this be in a helicopter?

GS: Yes. You'll never guess how we overcame the problem. You know how the Bell X-1 was with pods on the outside.

AH: Like the M.A.S.H. television show "Choppers."
GS: Exactly. There are the two seats here in the X-1, and the pods are here. The obvious problem was how are you going to hang the bottle to drip into the veins. We were thinking about it, and I went up one day with

one of these ex-service station men and HOLY SMOKES, this guy said "these people are in shock. Why don't you give them stuff." We were giving them stuff on the ground at the battalion station. We had to disconnect the tubing, put them into a pod and fly them back to the M.A.S.H. unit. He said, "if they're in such bad shape, why don't you continue to do it?" I said, "that's exactly what I've been thinking of - a way to do that, and I haven't been able to figure a simple way to run the tubing out, because the only place you could control it would be from inside, so you'd have to have the bottle hanging in the cockpit." You got the tube and a rush of air. He says, "Oh, I got that problem licked." So he took a circular gas-line and sawed it in half with a hacksaw. Except the way he sawed it was like this, and then he'd saw this half a little further. What you ended up with was a semicircle with some fingers sticking out. You could take the bottle, hang it up and then thread the tubing down and then slip it behind each notch and thread it all the way down to the patient and then close the pod the air would hit the gas-line shelter and dot the tube which was stable. I put that in and I didn't go back over, but I assumed that they made such a device because several different pilots were using it by the time I left. We spread the word that this guy actually invented it. He didn't even have a pilot's license for a little piper, and he's flying the wounded back and forth. They were amazing people, very ingenious. The first real Nat'l Conference in acute renal sufficiency was held in Ft. Sam, Houston under the leadership of Paul Tashano. Paul Tashano is still alive; he's at Vandervilt and is retired.

AN: He did a lot of work with artificial organs?

GS: Yes. Both John Merrill, who's now dead (he was the chief at Harvard), and I attended the research program which had been established at Walter Reed Army Institute for Research by its commandant, COL Stone with emphasis on kidneys. Stone used the influx of reserve specialists who came in on the doctor draft just after WWII to assemble a remarkable faculty at WRAIR including Lloyd Smith, Frank Gebstein, COL Frank ___, Russ Nelson and about forty others. It was an impressive group. I think within ten years, 85% of them were tenure rank professors at the American Medical... at the last counting everybody that was alive is a full professor. It was really a remarkable collection of people. I vividly remember Nelson bringing into my lab a fellow from Mayo clinic named Scribner which expressed an interest in kidney research. He left me a fine gift - his bedside _carbonate analysis kit. A graduate school was set up with visiting professors from the very best medical schools and associate faculty from the staff of clinical investigators. Post-graduate students were drawn from all the uniformed services including the Army, Navy, Air Force health service oceanographic and Geodetic survey. Grant finalists provided academic updating from the middle-management of officers who had remained in the service post WWII. Creators of this plan hoped it would evolve into a military medical school. Indeed it could well be considered as the forerunner of the present uniformed services medical school (USUHS). It interdigitated with the Army epidemiological board on which Merrill had been placed as consultant along with other fine nephrologists over a __ page. A rapidly developing momentum of post-graduate school at WRAIR was interrupted suddenly by Korea. The surgeon general was faced with unusually large numbers of battlefield deaths that could not be explained by the severity of the wounds. The early months of the Korean War which moved very rapidly were medically staffed almost entirely by young reservists fresh out of the very latest academic training at our university hospitals. It was marked, perhaps, by more medical innovations than any war in our military history. It included new forms of burn therapy, the use of concentrated albumin, airevac for evacuation for casualties, M.A.S.H. units for definitive surgery near the front, the first ever sutchuring of arteries on the scene to replace the traditional military amputation, the first regular use of blood transfusions in fresh casualties of battalion aid and collecting stations and a host of other advances along with dialysis. All the head trauma neurosurgery, for example, was

performed by a Dutch neurosurgeon volunteer and a freshly arrived third year resident from St. Louis.

AN: Which of those advances do you think was the most significant?

GS: Well of course I'm biased towards dialysis, but I think the fresh transfusions was a big thing and the whole M.A.S.H. unit concept.

AN: Had the first transfusion been a goal of the military medicine for a long time?

GS: Yes.

AN: It awaited a cool transportation system.

GS: It really wasn't a system. It was spontaneously begun. It wasn't like somebody sat down and designed the system. It just sort of came out of the fact that fresh blood was there, and you now had a way to fly it up. Doctors often operated at two or three different hospitals on the same day commuting by helicopter. The surgeon general decided to perform the first field research team which consisted of Curtis Artz, a regular Army surgeon who had done research on burns and was the man who performed the first skin transplantation between identical twins and later became a professor of surgery at the University of Mississippi. Russell Nelson was fresh out of the residency in surgery at Minnesota and the surgical residency at M.A.S.H. general hospital. He later became the chief of ___ surgery at the Latter Day Saints Hospital and is now one of the governing apostles for the Mormon church. It wouldn't surprise me if he's got a lot of stuff too. He was sort of a thorough fellow who might keep some photographs. I think I was the most avid photographer of the group. The late Fierendo Simeone who had seen service in WWII and then had been the Churchill fellow the surgery at the M.A.S.H. general hospital. He was put on, because he was actually a member of the Second Office surgical team and had had the service. He was the continuity from WWII in Northern Italy. He later became chairman of surgery at Case Western Reserve University.

AN: Who was selecting the members of this committee?

GS: The Surgeon General. And then I was the team's internal
physiologist, so I worked with the three surgeons. During our time in Korea, we examined the renal biopsies and the associate autopsy data on every unexplained battlefield death in the first year of the war and found something like an 18% incidence. I don't have that paper to classify. We weren't allowed to keep it, but it's got to be around somewhere. My memory is around an 18% incidence of tumor necrosis. It could be 19, or it could be 18 1/2%.

AN: Does that statistic surprise you?

GS: Yes.
AN: How come?

GS: It was high. It had not been identified any previous military situation. It's held to be true though in earthquakes and other diastrous instances.

MR: In *the Atlas of Tropical and Extraordinary Disease* published by AFIP, there's a sentence that reads "mortality varies, but during the Korean War it dropped between 5-7% after clinical management was based on the physiological requirements of the patients." Do you think that's accurate?

GS: Not initially. My memory of the original statistics is they went from the 80-90%. Now, if we're talking about the group of people who have multiple wounds, incipient shock followed by low urine volume, that's so-called alurea, and the death rate was 80-90%. After we wrote our report and put the kidney team over there, which was also by the way had the first blank photometer that was used in war time so we could do sodiums and potassiums at the M.A.S.H. unit level. And, of course then they had access to modern electrolyte solutions and they could be given intelligently because in WWII, except in big, general hospitals that had laboratories and people gave fluids, but they didn't know what the patient needed, because they had no way of evaluating the patients.

AN: Was the high rate possibly due to better diagnostic procedure, or was it possibly that the more seriously wounded were accurately getting back to the hospital before they died? Why was the rate so high?

GS: Why was the death rate so high?

AN: Yes. I mean, was it just that the more seriously wounded were actually just being able to get to hospital whereas before, they would have died on the battlefield and wouldn't have made it into the statistics?

GS: No. I don't think so. As a matter of a fact, we were probably pretty good at picking up people off the battlefield even back in primitive wars, but the injuries were much less severe. Penetrating abdominal wounds were really rare until we developed these fast shooting small guns.

AN: So high-velocity was a factor

GS: Yes. Certain guys would come in with six or eight wounds through the abdomen. Now, that wouldn't be enough to kill them; they wouldn't be bleeding necessarily but just the shock and the rabdamyhyalis they got from being under rubble and things like that. Most of the acute renal failure in WWII was from the bombings in England and the rubble. It's very, very analagous to what we're seeing now in earthquakes in Armeniad and Russia and so forth - the same kind of statistics. My recollection in the early studies, there were no formal studies done, but the people did keep track within an individual hospital. After the kidney was so-called the kidney-tent was put up over there and the lab people were sent over, that was put in over there to receive the artificial kidney when it got there, and we sent the one out of Walter Reed over to Korea but it took a while to get over there - to get it set up and everything.
Teshine(?) in his article sort of goes into that detail - how they used a metal gas tank for a water heater and things like that. The thing operated some months before the artificial kidney arrived, so we had really three periods, one in which we had no lab work available, one in which we had the lab work - one which might be called conservative morphology methods in physiology. And then, dialysis. The mortality rate dropped at least to 50% from the 80-90% just on the basis of the conservative morphology approach, and then probably another 20% from dialysis.

MR: You don't really think it ever got down to 5-7%?

GS: Not in our barracks, because we weren't even doing that well in university hospitals back home at the time. The death rate from infections were still quite high since we didn't have a lot in the way of antibiotics other than Penicillin. We documented one death in 14 hours in a perfectly health young man with multiple nonfatal, abdominal gunshot wounds, whose heart was dilated, and there was no reason or other explanation for his death except hyperteminium - which is high potassium. It was later established that the rate of accumulation of serum potassium in traumatic casualties was more than twice that of non- traumatized patients and that some of the deaths occurring in battalion aid stations were due to use of the universal "O" blood that was shipped in refrigerator bottles by helicopter. This was something that was totally unrecognized. We found out that potassium leaches from the aging blood cell. Most of this blood, by the time it got used, was getting close to the thirty day deadline, and we did some simple studies just measuring the serum potassium on the models in the refrigerator according to their age. We plotted the models and turned out to be straight lines as they were logarithmic. They were leaching at the rate of one millimole per deciliter of refrigeration per day. So, therefore, if you used 20 day old blood, it had a serum K of 20 milli-equivalents which was lethal.

AN: Did you try to counteract the accumulation of potassium?

GS: Well, if there was no kidney function, there was nothing you could do.

AN: Well, I mean, in the blood before you transfused it.

GS: Oh! We were just identifying the problem, and when the blood was used cold in emergency triage situation, the patient got immediate infusion of a very high concentration of potassium. Now with warming, the potassium re-enters the red cells. They become active metabolically, and we then used this fact to our advantage. In the M.A.S.H. unit we centrifuged refrigerated blood in a refrigerator centrifuge. In other words, we took the old blood that had potassium leached out, because the red cells effective go to sleep in the AC-D solution, and the potassium leaches out. In humans, the predominant intra-cellular cadien is potassium. The predominant extra-cellular cad ion is sodium. So, you have concentration of, let's say 140, 150 inside the cells of potassium and four outside and you have a concentration of sodium of 140 outside and maybe 5-10 inside depending on the state of the cell. These both would tend to flow downhill across the red cell membrane, and if nothing were working, if everything was sleeping and the membrane was inert, you'd end up with exactly equal concentrations of both on both sides of the membrane. Why don't you do that? It's sort of like a leaky boat and, you have a bailing mechanism and the bailing has to equal the leak, so you have a pump, and that's called the ATPA's fueled - sodium/potassium pump. It's very complex. New physiology is very complex. In fact, it isn't one pump. It's several pumps. It's a very vital mechanism, because you'd die in seconds if something goes wrong. Therefore, the cells wake-up and start metabolizing and using glucose as you warm the blood. So, essentially what you're doing is putting it into semi-limbo when you cool it down. So, we've refrigerated cold, and now the potassium is very high in next 30-40 milli-equivalents per liter. We take off the plasma. So now when we're taking the potassium out of the surrounding medium in the bottle of blood, we warm it up, and we reconstitute the cells in physiologic albumin solutions that has no potassium. Now you end up with metabolizing red cells that are potassium deficient. You might visualize it as a potassium sponge. Then we infuse that into the patient whose got the high potassium. Now he pulls the potassium out of the patient's serum into his transfused red cells. So, what started out as a catastrophe, we turned 180° into an asset by using the red cell potassium sponge in our favor instead of having it working against us.

AN: This is based largely on research you were able to accomplish in Korea?

GS: Yeh. Right up there.

AH: When was that technique actually put to use in the field?

GS: That summer (in 1951) when were we over there, we did all of these things as we went along. We used this in emergency treatment for hyperchemia in addition to sodium alkalinization of calcium. In receiving our report which was written in the old imperial hotel the Frank Lloyd Wright thing in Tokyo, the surgeon general immediately organized a renal unit at Walter Reed and WRAIR and dispatched a kidney tent to the 11th vac hospital which contained the first field flamephotometer, osmometer, electro-cardiograph, intravenous fluids, and other simple, renal laboratory equipment was used by early nephrologists such as Robert Post being the first scientific treatment directly to the field to post traumatic Algeria and burn Algeria in both civilian and military populations. This application of scientific medicine reduced the case fatality rate from close to 100% initially to 80% and ultimately, somewhere in the range of 50-60%. Initial studies were reported by Paul Tashano at the first meeting of American Society of Artificial Internal Organs. I got that book at home. I can give you folks that article. [Dr. Schreiner is referring to his reference source.] The field research team had also called for dialyzer and the artificial kidney in operation at Walter Reed Hospital was flown to the renal center in April 1965.

AH: I think we actually have that particular artificial kidney in our collection. I didn't realize it was in Korea.

GS: The water was piped from a nearby storage tower and heated by a fuel stove under a discarded aircraft tank. Temperature control was maintained manually by a corpsman with a thermometer. 220 volt power was supplied by a thirty KW diesel-driven generator. Tubing, chemicals and supplies were flown from Japan and the supply base we operated at WRAIR. The center remained at the Evac hospital for the remainder of the war. Seventy dialysis were performed in the last eight months in 1952. Tashano said, "Whatever general or medical opinion may be concerned dialysis in civilian patients," military interest in all aspects of this technique, and especially new dialysis science is real and intensely practical. The success of the artificial kidney in treating post- traumatic Algeria in Korea really caught the attention of a significant number of budding clinical nephrologists and chairmen and administrators at university hospitals and contributed significantly to its first widespread acceptance. [end source reference] To be really honest with you, Koff would agree to this; I got him one night to at least grudgingly admit that he was getting nowhere. He had come over to the U.S. and had a demonstration of his kidney in NY and from there George Thorn had seen it in operation as I did, and invited Koff up to the Brig and introduced him to Carl Walters. I have, by the way, a videotape of all this that I, of course, did the voice on. It's a commercial videotape. I can bring that the next time. It's actually quite good. That is the whole genesis of the artificial kidney. Baxter is quite interested in this. If you get something going, there might be some fundraising.

AN: Do you think they'd be interested in helping support an exhibit?

GS: They might very well be, because they did this book project, and I was a consultant. It was originally done in a movie, and the movie is better than the video. The video, at least the copy I have, is quite sloppy.

All the film of the early part of Georgetown is from an eight millimeter home movie that I made. I showed that one to Pat McBride. He was working with Baxter, and then they decided to produce the movie, but it's caught up little strips of early dialysis, were taken from my movie and used intricately throughout the whole thing in between the other historic strips. When you start doing something like this, you're amazed to find things you didn't know existed. We were trying to get permission from Hopkins to get a picture of the original hemodiffusor. Some guy said, "Did you know that Dr. Able made a sound movie," and Pat called me up and said, "There's a sound movie of Able giving his talk (the one that made him famous) on dialysis?" He did this first in 1916. I said, "He couldn't have." It was before sound movies. He said, "No, it's a sound movie." The sound which is reproduced in this Genesis movie (of the artificial kidney) was very good, and it bothered me for a long time. Finally, it turned out that Dr. Able gave this talk, and he was sort of a slick guy. He was a friend of the man who developed the first sound camera in Hollywood. So, before it was actually available commercially he __ __ able who pretended he was giving the original speech, and he stood up at the same podium, but it was a year or two afterwards. I couldn't figure out how he got a sound movie before there was sound. Able never told anybody.

AN: Do you think the fact that physicians in military situations have to jerry-rig things all the time, and they have technological challenges all the time predisposes them to technological solutions to physiological problems?

GS: Yes. I also think that the shame is that there's probably more of this done than we were ever aware of in the military situation. The shame is not that more of it isn't done. The real shame is that more of it doesn't get communicated.
Transcription cont'd - 3/16/92

GS: Who would find this stuff? I ran into doctors who had gone directly from Brooklyn, NY to their battle-stations and stayed there throughout their time. Maybe the got a week or two off back to Japan for RR. That was it. They went home. They didn't know what was going on in the other sectors. And the very fact that we were a research team not pinned down in any geographic place meant that we also had this ability to disseminate as we went. So as we were doing research, we were disseminating. A wonderful example was that I said to Curtis Artz, because I was a professional teacher of some experience and so was he, "You know, these people are not going to want to cooperate. They're going to be very, very busy. They're going to want to cooperate, but they're so distracted that they're really not going to want to spend any time with you, because it's going to seem to them like they're doing all the giving of the information, and we're doing all the receiving, and it's a one way street." And I said, "Here you got four academic people who are all pretty well known as speakers and as teachers. This would be a wonderful chance if we could, instead of just walking in saying, 'we'd like you to answer some questions about this and this, and we have this questionnaire...'" After all, here are people who had been over there, not heard anything up to date other than through their own military channels. They had no way of knowing what was going on in back in the U.S. So, we prepared a whole series of talks on shock and treatment, fluids, etc., and there was no way to show the slides for these figures. Artz came up with, it was completely his idea because I couldn't figure out how we were going to do this said, "Maybe we could have maps or something. He remembered magicians gimmick of the womens' scarves. They keep pulling them out. There's a thousand of them. So he got some of this thin silk, and he silk screened

all of the slides on silk. In a little time, we could carry the slides for ten lectures. We just pulled them out, and we pinned them to the tent. That was brilliant I've never seen it even talked about or written about or anything. They must be around somewhere. I bet you if we got a hold of these, (he's dead), but he must have some family around.

[Tape Ends]Side 2

GS: We reproduced a lot of my slides, because I was the one who was most accurately teaching at that time. I had just come out of the physiology department, so I had a lot prepared for undergrads. He prepared slides also, but the idea of putting them on the scarves was Artz.

MR: Do you find yourself passing along techniques that weren't in your field as or like surgical?

GS: Yes. I was not a surgeon. Each guy decided we would try to make ___ philosophy and try to make our contribution as best we can so that we wouldn't appear to be selfish. We weren't selfish. None of these people were. They were all very dedicated. Simeone, who was a brilliant vascular surgeon decided that his contribution would be to teach the young surgeons how to suture arteries properly. So, he brought along a whole suitcase of this optical silk. Even saying "this is how you do it" wouldn't allow them to because they didn't have the material, the correct suture material, the fine silk and the glasses and so forth. He bought all that for them, his personal baggage. Curtis and I would go or Russell. We broke up into two's so we would function in two different places at the same time. Usually Nelson and myself and Artz and Simeone, or some combination like that in the various places that we would go. We were following the same protocol eliciting in the same information, but we were often doing it two places simultaneously by splitting the team. So I would go and give a lecture, and Curtis would go give a lecture, and then Simeone would go into the or with the surgeons and demonstrate how to suture and how to avoid amputations. We spread that all over. All the M.A.S.H. units in Korea learned how to suture. If I was in a place and I saw that a fellow was having developing gangrene in the leg, and they were planning to amputate tomorrow, and I said "Is there anything we can do to put him in better shape." "Let's call Simmy, and maybe he can save the artery." I'd tell them what he's doing, and that doctor wouldn't know that was going on til 20 miles away, because they were separate. The sectors were moving forward like this with the second corps here. The first corps here and the Marines here....They never knew what was going on. We actually acted as almost couriers. We would constantly take stuff around. If we'd come back to Japan we'd come back with reprints and all sorts of things.

AH: Did you ever have any contact with the Navy hospitals?

GS: The ship, yes. I was asked....You asked me what basic problems were: one to rec___ the air-evac and see how it was working and, how it was organized and what could improve it. The second was how to reconcile the techniques for multiple...they were potentially very dangerous...for a multiple injections of pain killers. A guy on the field would be picked up by a corpsman and given a shot of morphine if he was in severe pain, and then he would be tagged, but the tag might be lost. Then they'd be put onto the helicopter and given another shot of morphine, put back in the air-evac back to Travers, back to Hawaii and give him another shot of morphine. By this time he was....So they developed all sorts of techniques. There was a tag that was supposed to take care of that, but it didn't in reality. Up front, we took to developing skin crayon. We could write it on

the forehead. They want to study what were the times, exactly how long it would take the average guy to get throughout all of these steps. So the way we did this was to go up and choose an armed patrol that was going out at like 6:00 in the morning. We'd go right with them and then pick up the first wounded, and then we'd just stay with those wounded men all the way back. In fact, I made one run back to Manila, then I'd come back and pick up another group and then off to Japan. We'd go on all these various routes to see what was happening. It was quite interesting, because we'd uncover all sorts of things wrong including putting body casts on wrong for people who had bowel injuries. Surgeons had to stay up all night some times on the tarmac and change casts before they could let the plane take off.

MR: It sounds like your four man team was very successful. Did the Army ever evolve their own travelling team after this?

GS: That's a very interesting question. Not to my knowledge. I haven't had that much contact. We had the airevac, the reconnaissance of the times from woundings to definitive treatment by all different groups - one of which involved my taking a train. We had a train, a hospital train that went all the way down to Pusan and Taego. I took that all the way. That was really a dismal trip. It was a hot, dusty day, so I was grimy, and I hadn't had much to eat, hadn't had a bath in about four days or something like that. I got down there, and I think it was the repose. It was either the repose or the hope. It was probably the repose. It involved the guy that later became commandant at Bethesda Naval Hospital, and then he became Surgeon General, Bobby Brown. He was the commandant of the hospital ship. I called him up and he said, "I know what you need. I'll send my tender." He let me use his shower for a hot shower and gave me a steak and glass of scotch. The next morning they asked me to come in to make rounds in the general hospital, because they heard I was there. The medical guys wanted to see somebody, and there were several Georgetown, NYU alumni there, and of course, they took me around to see the patients. The second patient I saw, a fellow had a hemorrhage in his conjunction, and I couldn't think of what was going on, and I couldn't contribute anything that would do anything. He seemed to be pretty healthy other than that. I asked him where he was at and so forth. He had been up North in a marshy area where there was heavy Malaria, and he'd taken a lot of Atabrin. The only thing I've ever seen like that in all my life was sort of a allergic reaction you get from drug sensitivity, and Atabrin is actually pretty rare.. They thought that that was great diagnosis and then we went down the line of beds, and then in about four beds later, than the other guy sits up with conjunctive hemmorrhages. I just don't think that kind of sensitivity doesn't run in epidemic. Then they started pouring in. In retrospect, those were the very first cases of hemmorrhagic fever. Within a week, the pathologist Paul Horst (?), whose papers would be good to get, came over from the 406th lab in Tokyo, and we had their translators send from the Library, a translation of a reprint in Japanese from when they had invaded Korea and had run into this peculiar disease which led to kidney failure. So all the rest of the time in Korea, every night, wherever we were, after we finished with our research work, I volunteered and worked in the hospitals taking care of patients. Of course epidemic hemmorrhagic fever was probably the single biggest contribution of the Korean War to Nephrology, because that disease was totally unknown. Of course, now we know that a virus disease.
That's why I was in Korea - to give this lecture at the __ virus _. We want to go ahead and show some of those slides. Anytime you all have to leave, I know you've worked on your time schedule. I can come back again. I just wanted to get started doing this.

AN: Would you like to take a break?

GS: My time is yours.

AH: In Elvert Calgrey's book on the medical dept. in the Korean War, he makes the observation that, at least right after the second World War, the Army was pretty much adopted the standard AMA model of very specialized doctors. ___ his observation was when you went into a military medical situation, most of the people didn't really have the training that was appropriate for that. They had gynecologists that suddenly had to deal with trauma wounds. Was that a problem?

GS: Well, I'll tell you why it wasn't a problem. It would have been. Anybody who sat back and looked at the organization legitimately could see that, and there was no question that one ran into isolated circumstance like that. Probably more in the Navy than the Army. I knew a fellow who was on a carrier once which is a small city, and one of the two doctors was a dermatologist. That's not what we conceive as mainstream medicine or surgery. If the surgeon was tied up, who could do the emergency appendectomy? The thing that was really different about Korea was...my impression is that for some strange reason, almost all regular Army military surgeons had just left Korea as the war broke out. I only met one regular Army trained surgeon the whole time I was there. He was so good, and so needed that he had to run around like tending sheep, running around from hospital to hospital to help the guys. But the other side of the coin was that almost all of them were reservists right out of residency. Like this kid from St. Louis who was a neurosurgeon out of the Dutchman. The Dutchman was a volunteer who came over....He was not a board certified brain surgeon. He was not an American-board brain surgeon doing brain surgery in one of the largest head trauma services in the world. There was only regular Army psychiatrist fellow named Glass. He was terrific. He did a great deal of support, because everybody was in terrible shape mentally trying to cope with all this....The unit we had at ___ during the first year of the war had 19,000 casualties. It was really something to deal with, and most of the guys were young, but they, in turn, had the advantage of having come right out of residency training where you're forced to get a broad experience. It's really before you're going into some specialization, or even if you were a surgical fellow - say, a neurosurgeon involved in any particular field, you'd just come out of a general surgical residency. It turned out to be a blessing in a way, because these guys were really surprising, adapatable, because they were close to fresh, good, broad training. So his criticism, I think is more theoretical certainly for the first year of the war, and is based on if you look at the classification of the doctors in the Army, then I would agree with him, but if you actually looked to who was over there, it was quite different in a way. You'd rather have somebody broadly well-educated that reflects a well-educated man, than somebody over-educated and over-specialized.

[descriptions of slides - open discussion]

AH: Did you have much contact with the Republic of Korea doctors?

GS: Very little. That was the first Chinese nurse that we captured. She'd had been told that she'd be raped and assaulted. She was totally scared. That's Curtis Artz...He spoke a few words of Chinese. She lived with the American nurses and realized that American M.A.S.H. guys weren't so bad after all. She eventually agreed to work on some Korean patients, P.O.W.'s and so forth. She didn't work on our casualties. That's the M.A.S.H. unit what we called the 'Double Nickel!' __ ___ or something like that. Most everybody thinks that that was the only one with a double digit, the last numbers the same. There were many things about the commandant that were very reminiscent of the character in MASH - the guy with the fish files in his hat,

Henry Blake. The guy was a G.P. from Kansas.
AH: How often did the M.A.S.H. unit come under enemy attack?

GS: You know, we almost lost a Navy hospital. They ordered us to pick up the M.A.S.H. hospital which didn't happen very often, to move closer to the front, within 20 miles or so. We stayed there because the front was moving away from us. It didn't move as much as you would expect. One was in trouble if they told the guy to pack up and leave in 24 hours which was impossible. It sat down there for six months and had all this stuff built up around it....Anyway, he got the whole thing, the trucks and everything and started going south and the fellow who was leading the truck made a wrong turn and ended up in some desolate area and the next day, Air Reconnaissance showed the Chinese had set up and were close to taking a hospital.

GS: There was a story in one of them that the doctors told that a surgeon actually killed a Chinese sniper during an operation. He pulled a revolver out and broke scrub and shot the guy as he came around the corner.

AH: In your experience, did the doctors on the front have very good training in military tactics?

GS: No.

AH: Did they kind of wish they had?

GS: Yes. There was a widespread rumor that on the first anniversary, the Chinese were going to try to push against the forward M.A.S.H. units, so the commandant of our unit said, "Every man who isn't actually scrubbed and doing an ____ has to take a tour of the perimeter and patrol with an M-_. So you can imagine how scared I am, never having taken a day of military training. I never had any weapons training at all. What I knew, I knew from firing a _22 target rifle and hunting with my father, but there I was up in that corner, scared stiff. I had to go out and take my four hour perimeter tour outside the perimeter of the M.A.S.H. I said, "I don't know if I can hit anyting." The other guy says "You don't have to; if you see anything move you fire in the air and we'll hear that shot. That's what we want you for. Early warning system."

AH: How many people were with you? Was it just one person walking around?

GS: No, there was a guy each hundred feet. It was all bushes. So there was a ___ _ patrol, and each guy had to walk a certain distance back and forth.

[Slides end. Group looks at photos. Copies of all material is in Archives.]