12-12-2007

James Veghte: The Cold War Aerospace Technology History Project

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Today is Wednesday December 12, 2007 we’re talking this morning to Dr. James Veghte who, when he retired from the United States Air force in 1975, retired as the chief of the Environmental Physiology Branch of the Aerospace Medical Research Laboratory. This interview is being conducted in the studios of the Center for Teaching and Learning at Wright State University as part of the Cold War Aerospace Technology History Project. The interviewer is Gino Pasi and as I said our interviewee today is Dr. James Veghte. Dr. Veghte, thank you for finally getting together with us and taking some time out of your busy life to meet with us today.

You’re welcome. It’s nice to be here, and thank you for the honor.

Well like I said we’re glad to finally get you to sit down for us. To begin would you provide us just a brief synopsis of maybe some early biographical information and move into your university education and why you ended up studying what you did at the university.

Well, I’ll try to be brief [laughs]. I think to explain myself, or perhaps to let you understand a little bit about my personal goals and challenges, I grew up in upstate New York and Vermont, and was very interested at an early age in birds and all nature, but primarily birds fascinated me from when I was about 5 years old. And parlaying on that type of experience as well as a very independent childhood—we lived for example in six different states while we were growing up before I was 16, and that includes being on a dude ranch in southeastern Arizona. And we rode horse-back to a one room schoolhouse which was just exiting, very independent type of exposure I guess.
And going from that I went to Bowdoin College in Maine, which is this small liberal arts school primarily, because it had a professor in ornithology that I became aware of. So I said “okay, I’m interested in birds, let’s go there and we’ll see what happens.” So I got my bachelor’s there in ’49, but a lot of the experiences that I had at Bowdoin, I would say, were highly individually oriented. The professors taught the introductory courses. They had a biological station for example in the Bay of Fundy and so we went out there a couple of summers and it was an island that had tremendous riptides, one of the largest in the country, and we were looking at birds and everything, and studying birds. This love of ornithology carried me through this school.

And then I went to Harvard for a year. And at that time I got a draft notice in 1950, because of the Korean conflict to report for duty in the Army and I said “well, I didn’t particularly want to join that branch” so I jumped into the Air Force [laughs]. At September 1950 I went down to Laughlin Air Force Base. And it was surprising, at that time even though I had a college degree and I had started for my masters, I went in as a buck private. And about 75 percent of the recruits at that time were college graduates, so the Air Force really had quite a selection of the cream of the crop, education-wise. So I received my basic training at Sheppard Air Force Base in Texas; Laughlin Air Force Base was too full, so we slept in tents and went through our basic training and learned what the military was all about. And after that you took what they called a “stanine test profile score” and based on that you were assigned to various career areas within the Air Force. They had a need for weather observers, so I was assigned to that and then went to went to Weather Observer’s School at Chanute Air Force Base in Illinois; got my training there and then was assigned to Mitchell Air Force Base and went there out to Suffolk County for my basic duties as a weather observer.

Pasi: That’s on Long Island, is that right?

00:05:41 Yeah—quite an interesting area. But anyway the responsibility of that particular career or job was to prepare weather maps, very detailed. You had to have good eyesight, because they were very small for the air crew members and the pilots. Then I went to Phoenix later on, as a—well that’s jumping ahead a little bit—but anyway based on that experience, the next step was I wanted to get my commission and so I applied for pilot training, and also for OCS. Because of rather a small anomaly, I was physically not fit for pilot training. Well it was interesting; I got a set of orders saying to report as a weather observer to Korea, but at the same time the next day, I got orders to go to OCS class in Laughlin Air Force Base. So I went there rather than Korea, but it was very close.
00:07:03 Pasi: And did you have to make sure some strings were pulled to get you out of going to Korea? How did one supersede the other?

00:07:09 Veghte: Who knows? No I didn’t pull any strings; I was all set to go. But anyway, the next assignment was down to Luke as a weather forecaster. And to make a long story short, I was assigned to do research in the weather field at Wright Field. So I got orders and I came up here and what happened when I got here—you have to understand I wasn’t particularly reticent. I looked around the other labs [laughs] and I found the Aero Med Lab.

00:07:50 Pasi: So you were already thinking of making a jump

00:07:53 Veghte: Well I was interested in what was around and what’s available. I wasn’t that excited about doing research and weather. So I found the Aero Med Lab and I boldly went in and asked if I could speak to the commander, and I did and it was a Colonel Bollerud and he was a flight surgeon. I guess up to then most of the directors of the lab were flight surgeons. And Colonel Bollerud somehow, and I don’t know how, pulled strings and I was assigned to the thermal group at the laboratory, and I started my career there.

00:08:38 Pasi: Now maybe to jump back a bit. When you were drafted, you were drafted by the Army.

00:08:43 Veghte: I got my draft notice.

00:08:46 Pasi: You got your draft notice. Now why did you choose the Air Force, because of its maybe more intellectual rigor than say the Army, or what were the factors.

00:08:57 Veghte: No. You have to realize I was a little younger and maybe more idealistic. I didn’t want to shoot at people; I didn’t want to kill people [chuckles].

00:09:09 Pasi: Now was that born of a religious pacifism.

00:09:11 Veghte: I don’t know. I don’t know. I don’t know where it came from [laughs]. It was just one of those things I felt that if I had my druthers, I’d rather not do that.

00:09:23 Pasi: So you came to Wright-Patterson about what year, early fifties?

00:09:29 Veghte: 1954, the first of the year.
And wound up in the Aerospace, or Aero Medical Research Laboratory at the time. And what were some of the initial projects that you worked on there?

Well I found out I landed in a group, a small group of research people. John Hall I believe was the Branch Chief at the time, or it may have been Mr. Mauch, who was a “Paperclip” scientist. These people had some military there. Thinking back on it, I may have been one of the first military, well one of the only military at that time. And I came in of course as a Second Lieutenant.

I didn’t know what to expect, but I was given, first of all, I was given a project to develop and flight test an in-flight recorder, a physiologic monitoring piece of hardware. And so this was under contract with Douglas Aircraft. For those of you who remember, Douglas was out in Santa Monica, and so I just tagged along; this is my job. So I went out there and talked with the engineers and what parameters were to be monitored, what sensors should be used. And then it was flight tested at Edwards. So I went out there and kind of oversaw the flight testing of this particular device.

And again this device was called just an “in-flight”—“physiologic in-flight recorder.”

Oh, it measured your heart rate, your body temperature and your clothing temperature, things like that. The normal sensors for a lot of the things are thermisters or thermocouples. And this just measures temperature of various areas, or regions, or parts of the body, and I think it even had a rectal probe at that time.

And did this work seem a little more exciting than weather observation and research to you?

Not particularly [laughs]. It wasn’t really my forte, at least my primary interest. But along with this you’re given—if you can envision at that period of time, ’54, it was a very exciting period there. A lot of young military—the military is very close cliquish group. And civilians—there were old-time civilian heads there at the laboratory kind of mentoring these young brash people that all of sudden appeared on their doorstep and they’re in charge of.

And I became involved in looking at the response of people to temperatures. The group had what we call an “all-weather room” that had
So I quickly got involved in that. And the way the system worked at that particular time, there were various projects that the branches were assigned to, or were responsible for, such as temperature exposure inside of anti-exposure suits, or something like that. So we used the all-weather room; we also had a unique facility, an altitude chamber, plus a high temperature capability; it went up to 350, plus 350 degrees Fahrenheit as you went through altitude. And we had that facility. And then there was a facility to measure the Clo value of clothing. This is a way of scientifically looking at insulation. So with those tools that were available, we explored a lot of different things. But one of the initial projects was looking at the problem of anti-exposure suits. The aircrew members on overseas flights got hot

Pasi: Because of the duration that they had to wear the suit?

Veghte: Yeah, it impaired their capability of flight maybe a little bit. So we had a group of “paperclip” scientists in our group, about four “paperclip” scientists and their primary responsibility was to design an air conditioned garment that could be worn under the anti-exposure, or the cold-water anti-exposure suit, and later on also the flight suits. So they were primarily focused on that particular area. And we just tested it and see how efficient or effective it was.

Pasi: So these suits were designed, anti-exposure, for cold water crash in essence.

Veghte: Yeah, emergencies.

Pasi: But the problem was that the pilots and crewmembers were getting hot underneath them?

Veghte: Yeah, it’s a rubber bag, essentially a rubber bag. If you a rubber bag, you sweat. Well it has nowhere to go, so you don’t have evaporative cooling. So that was one of the studies.

Then we had very fertile imaginations; [laughs] they evolved in all kinds of things and studies within the purview of what we were supposed to.

Another interesting sidelight, this was before the human use review process was really initiated so the only purview of the studies—you wrote up an experimental design and protocol to do whatever you’re studying
and it just passed through the branch and if you had a flight surgeon, he looked at it. But that was it. There was no rigorous testing that for me, would today or later on during my career. So those were some studies that we did.

00:17:08 Pasi: So to get a sign-off on a project, it didn’t demand a significant protocol.

00:17:12 Veghte: It was internal. No--which was kind of interesting in a way.

00:17:18 Pasi: You talked about it being an exciting time and a lot of young people coming aboard to work at Wright Field, and your laboratory, or other laboratories. Why did you think that was in the fifties and early sixties? I mean what prompted that, or what was its catalyst?

00:17:44 Veghte: I don’t know really. I just know my own experience. There are a lot of inductees during the Korean War; there’s a requirement for because educational requirement for a lot of the young M.D.s to go into the military and serve time. So we had a lot of young flight surgeons that were available or came in the lab. A lot of ROTC I suspect. I’m trying to think about the people that I was familiar with that came there. We had people from UCLA, young graduates, engineers. We had a doctor, an M.D. Paul Webb, came as a civilian. But in terms of military, I don’t know the forces, at least I can’t think of them right off my head right now.

00:18:57 Pasi: Do you think it’s safe to say that money was plentiful at the time and that the government was willing to spend large amounts of money on research and development

00:19:04 Veghte: Yes, that was certainly true. Even though we fought for money, so to speak, for our various projects, in terms of equipment or travel, or whatever, money didn’t seem to be a primary issue at that time. So you’d come up with—you need some equipment—either as built “in-house,” we had some very, very, talented people who could build almost anything in terms of sensor. Gienapp and one of the “Paperclip” scientist, Willie Buehring could make almost anything that you wanted to. So there was that plus my stumbling around Wright Field. I visited just about every building there, being a curiosity nut so to speak. And they had facilities left over from the Second World War down the flight line where they actually made airplanes. So you’d go down with a thing and if it was justified, they’d make it for you. So it was a very interesting area. To us you know we just had our projects and if we wanted something we just went ahead and money was not a particular issue.

They also fostered the mentors that you had, the old-timers there at the field, visits to scientific and professional organizations. The Aero Med
association was the primary one for us, to give papers, to present posters of your research. So it was a very, I don’t know, supportive type of environment.

Pasi: And you say “supportive” because you mentioned a lot of “young,” “brash” newcomers coming up. And the relationship with the “old guard” was a supportive one?

Veghte: It was by and large. Of course you had personalities like anything else with people, but it was very supportive. And there was no to my recollection there was no animosity between the “paperclip” scientists who were civilians, or the other civilians and the military, not at all. You all had a job to do and you just went ahead and to do it.

Pasi: And you didn’t foresee at the time any conflict of mission or focus between the old guard, and the new guard.

Veghte: No, other than we felt that being “brash” that we knew more than they did [laughs]. But that was just a matter of immaturity I think. John Hall, our Branch Chief was recruited by General Armstrong—well then Captain Armstrong—to come to the Aero-Med Lab. The Aero-Med Lab is a very, very old lab, one of the first on the base. And it was established in 1935 by Captain Armstrong, who was an M.D. a flight surgeon. He recruited John Hall in the late thirties and some other people.

Pasi: As you said, primarily flight surgeons, and that would eventually change? The leadership would be moving out of the surgeons.

Veghte: I think Jim Brinkley, after I left the lab in ’82, Jim Brinkley became Lab Director, whatever they called the Lab at that time, but he was the first, I think, one of the first non-M.D.s or flight surgeons.

Pasi: Dr Veghte you mentioned the Project Paperclip scientists, and I know a lot of the other gentlemen that we’ve interviewed for this project that have worked in other laboratories, Propulsion, Signature, all that stuff, they’ve talked about Project Paperclip. I didn’t know that there were Paperclip scientists involved in aero medical research, but obviously they were.

Veghte: Yes and not only in the Aero Med Lab at Wright Field, there were also some down at Brooks in terms of looking at radiation studies. But their branch chiefs, the “paperclip” branch chiefs, usually they’re highly trained and educated individuals.
Pasi: And again maybe for layman, Project Paperclip was bringing scientific experts out of Germany into the United States after World War II.

Veghte: Right. And as I understand it, and I’m no expert in the history of paperclip scientists, but they wanted to grab some of the people they thought would be useful in important projects, like the development of jet engines and things of this nature, before the Russians grabbed them. So that was my understanding, I don’t know whether that’s true or not.

Pasi: Well speaking of the Russians—

Veghte: Yes? [chuckles]

Pasi: This is the Cold War Aerospace Technology History Project. When you arrived at Wright-Patterson, or even when you were drafted into the Army, 1950, the beginnings really of the Cold War, how did—when you arrived in the Air Force, or more specifically Wright-Patterson, was it apparent to you that you were a participant in this Cold War? And if so, how did your laboratory management convey your role in the nation’s defense if at all.

Veghte: Well of course looking back, I would say that I wasn’t very aware, but I was certainly a gung-ho military person and supportive of the military operation. I think that came about a little more gradually as I matured. You have to understand this egocentric individual [laughs] was coming in and he was so—wanted to do research that that was the important thrust in his mind. The Cold War—we read everything we could about the research in the relevant areas, Russia and looking at the history of the German aerospace medicine and their publications. We used F.T.D., the Foreign Technology Division, that was called at that time, for any information that was available so we became aware of what the other, the Russians if you will, were doing in this particular area and we quickly found out, we were way ahead of what they were doing. So we were aware of it, but we kind of pushed it back and I can’t recall any thing that we pursued on the piggyback of the Russian research on our area.

Pasi: So you were always blazing your own path fearing that

Veghte: Yeah, that’s a good way of putting it I think. We were going ahead anyway.

Pasi: And in the intelligence you saw, really there was nothing to grasp or take with what the Russians were doing.
Veghte: Not that we used that was relevant. Now there may have been something that the paperclip scientist, Mr. Mauch, was aware of because he was so focused on developing this air ventilated system.

Veghte: Yes, H, A, N, S. But I wasn’t aware of it. Once, you know we would talk about the Cold War in a political sense when we got together socially, but not much.

Pasi: And that’s, is his name “Hans” Mauch.

Veghte: Once in awhile something would come floating through, the state-of-the-art synopsis, would come floating through from various sources, primarily probably from F.T.D., just to make sure that you’re aware of what was going on. But that was very limited I would say, very limited.

Pasi: How would this intelligence come to the Aero Med Lab, via Soviet documents, photographs? Was it something that you as just at this time maybe a “low man on the totem pole” in the lab, something that you would get your hands on. Or would leadership convey that to you.

Veghte: Once in awhile something would come floating through, the state-of-the-art synopsis, would come floating through from various sources, primarily probably from F.T.D., just to make sure that you’re aware of what was going on. But that was very limited I would say, very limited.

Pasi: You’ve talked about some of the early projects you worked on. How would these ideas come to your laboratory? Could you describe the process that an idea would take from its inception to an actual useful product at the end of the line?

Veghte: Well there are a number of examples I guess I could use. Let me start of backward perhaps. The end product that we were looking at was flight clothing, ok, and as a matter of integrating the person with this clothing. So initially the responsibility or the directives came from projects and these projects, they had numbers to them, and these projects were the result I think of the interaction of the research group, like the thermal group and the management. And these battles were fought out by branch chiefs and maybe a little bit about the systems command down at Andrews. I’m sure there is interaction between the laboratory once they formulated what they felt was a relevant project or study. They forwarded it to the Systems Command and they got an OK or a NO K, whatever. But once this project was assigned to the laboratory then the people started working on it and there were times when the Branch Chief said, you know “Jim, would you mind working on this?” Or “would you do this…this is one of our priorities?” And then we went ahead to the best of our background work, experience, and other things. We had guidance all the way, even though we were principal investigators in looking at the ventilation of say full pressure suits or something like that, of Capstan suits. What would you do? We’d set up a relevant temperature parameter, for example, ok later on, when we got into Man in Space or full pressure
suits, the standard exposure is around 160 degrees F for an hour, looking at that. We’d study that.

Pasi: When you say “standard exposure” for what? What exactly do you mean by the standard exposure was this degree for an hour.

Veghte: This was something that we came—it’s human tolerance. In other words, without any protection, human tolerance is about 160 degrees F, for about an hour. So we kind of used that as a guide or a milestone to look at various protective devices if you will, the air conditioning, the undergarment and things of this nature. So we went and did this study. Did it help? Did it not? What improvements should be made? Did we need more airflow through the air conditioning suit to extend the tolerance say to two to three hours? We did longer times at a160 F with the protective devices so as one example.

We did as you know, well we did later on, studies of man in space. And one of the things was just determined the tolerance to these high temperatures that might be encountered during these emergencies reentries, so that would be an end item too.

Pasi: so you had to develop clothing that would withstand this heat.

Veghte: Well we knew so little. The Air Force at the time was very ambitious and wanted to get in space and have control over the Space Program and it was called Man in Space. During the late, mid and late sixties they got into this arena. And there were so many unknowns when NASA came into being they had no test facilities, so they came to the Air Force with questions. And one of the questions revolved around what was the tolerance to high temperature emergency thermal profiles as the vehicle, Project Mercury at that time, was coming at a non-optimal angle for reentry. It encountered higher temperatures. What would you do? How long could you tolerate them? So we looked at them protected, with full pressure suits, and unprotected with just flight clothing, and things of that nature. So that was an end if you will, getting back to your question. That was an end item in itself. So it was just quantitative physiology I guess.

Pasi: So the laboratory would say, “this is the end result; we would like to undertake research and experiment in this to provide this to you, is this something you will fund?

Veghte: Yeah. I think it was the other way around in this particular case. NASA asked us to do it.
Pasi: I see. So this was—Mercury was the first manned space project right? And did you come into contact with the Mercury Project astronauts? Would they take part in the experiments?

Veghte: No they didn’t take part in the experiments, they were probably too smart. [Laughs] All the original Project Mercury candidates came through the lab because as I mentioned we had the facilities; NASA had nothing and yet they were screening all these potential Project Mercury candidates. There were over twenty of them, came to the lab and were exposed to various environmental stressors to see what the physiologic strain was involved. So we you know Glenn and all the rest came through and they were exposed to this 160 degrees for one hour.

Pasi: May I ask how you arrived at that 160 degree litmus

Veghte: By just subjecting people. We had a limiting rectal temperature that we monitored and heart rate, and it was one hundred beats heart rate, a hundred and eighty for three minutes and a rectal temperature of over 102 F.

Pasi: Would you subject yourself to these experiments? Would you subject animals to these experiments?

Veghte: We subjected ourselves. In the early days we did no animal work, although there is quite a large vivarium at the Aero-Med Lab, but they’re used primarily for drop tests, centrifuge tests, things of that nature. But our tests were done all done with humans. And yes we used ourselves. The philosophy that was developed, at least by myself, was that you better expose yourself first before you expose anyone else just to see if there are any problems. And also when you write—everything is written up in reports, tech reports or professional journals—you know what you’re talking about. So yes we subjected ourselves.

Pasi: Now this is moving ahead I guess maybe from Project Mercury, but I believe in the mid-sixties you received some commendation for some of the experiments that you put yourself through, is that right, this 460 degree Fahrenheit extreme for three minutes?

Veghte: Well what happened as I mentioned earlier, to look at the tolerance time unprotected just wearing flight clothing without a helmet or bare hands? What was the tolerance time during these emergency or steady-state temperatures that might be encountered by Project Mercury? And we gradually exposed ourselves. First of all we built an oven if you will; it was a six foot cube and we’d sit inside on a little kind of a frame so we exposed most of our body to it. We’d sit inside and the walls were heated up by hundreds of quartz infrared lamps so that it could mirror.
We had programmable instruments that would follow a profile that you put into it. So we could simulate temporary transient exposures up to a thousand degrees F and these emergency profiles. But anyway this particular study we were just looking—what can you take? We had no idea. And so we gradually went into the experience and found out that at 300 degrees F you had difficulty; you had pain in your entrance to your nostrils, your naries, because all the available liquid, fluid, surface fluid was evaporated by these high temperatures. And pain was reached a little over a 110 degrees F. and when that was reached, you had to start mouth breathing. We learned that as kind of an intermediate step. We gradually explored the higher steady-state conditions. We went up as you mentioned 406 degrees for three minutes.

Pasi: You went up to 406 degrees for three minutes.

Veghte: And the reason I stopped was I could smell my hair burning. There’s a distinctive odor as your hair kind of singes. And I said “that’s enough [laughs]!”

Pasi: This is without protective headgear, nothing on your hands?

Veghte: Just bare-headed. And the reason you can get away with it is evaporative cooling, the sweating and everything. Anyone kind of looks at you, you say “well I cook at 350 you know,” an idiot or something [laughs]. But anyway it was very interesting; it was published. And it helped I think.

Regressing a little bit, I was stationed at the Arctic Aero-Med Lab from 59 to 63 and one of the things we made sure we did was interact with the flight crew members to find out what the problems were, and then to simulate these conditions and let them know what the parameters were. For example we tilted one of the myths every year, that was one of our goals. And there was a prevailing myth that if you accidentally got a leg or something—or your body got immersed in water, you had to quickly start a fire, or else you’d freeze to death within minutes you know [chuckles]. And so we looked at that by—well regressing again, up in Alaska where the Aero-Med Lab was in Fairbanks, most of the travel in the winter is along the rivers because there is less snow and there’s less trouble getting through the brush and everything else. But there are always air bubbles or pockets in the ice, so it wasn’t uncommon to break through and immerse you leg in water. And so we did that; we immersed our leg up to our mid-thighs with all kinds of thermal couples on your leg just to see what the problem was. And we quickly found out it was about thirty minutes before you reached a skin temperature of about thirty.

Pasi: In the water?
Veghte: No this is out. You just immerse it for a minute and then come out with the flight clothing, trying to simulate a realistic condition. And so we quickly found out, well it’s not that big of a rush to go out and build a fire, and you’re not going to die; you might get frostbite. We monitored the other leg as well to see what was going on. Then we exercised, we just walked around and the tolerance time was extended to sixty minutes. So things like that we could report and tell the air crew members “don’t worry about it, what you’ve heard was not accurate.”

Pasi: It sounds essentially that survivability of pilots was the overarching concern of the laboratories.

Veghte: What do you mean by that.

Pasi: Well, pilots’ limitations, survivability. They wouldn’t burn up; they wouldn’t freeze to death.

Veghte: That was that particular area that I was interested in.

Pasi: How did upper management of the laboratories look upon you guys doing experiments on yourself? It seems like today there would be all kind of litigious things coming into play, but at the time, maybe not.

Veghte: I don’t think you can do that type of research much any more. You have to realize that there is—research in this area and a lot of areas was, first of all, descriptive, just what happens. And this was kind of the tag end or end of descriptive physiology if you will. And as the Human Use review committees came in there were more and more limitations on what you could do. But initially when I was first assigned to the lab that wasn’t true. So this descriptive phase was allowed. I don’t know what the upper management thought of us [laughs]. They just let you do it. I don’t recall an instant where they said “don’t do that.” So it was just mainly dictated by your work experience which gradually built up and the experience of your mentors that you had. It’s interesting. How do you learn what’s going on? A lot of people say that everything can be done by modeling now, but it’s based on descriptive data.

Pasi: It seems like it still has to come back to a human subject at some point, anything done on computer,

Veghte: Yeah, exactly. Yeah exactly.

Pasi: Did computers change the shape of your work as they began to increasingly play a role?
Veghte: That happened later on right toward the tag end. Yeah, This was probably before your time, but I remember the era of cards and Marchands, cranking them out, all this data. It was very laborious. But the computers came in and thermal regulatory models to model the environment of the cockpit and things of that nature.

Pasi: You’ve mentioned doing cold temperature research; you’ve mentioned doing heat research; were those types of experiments always ongoing simultaneously, the cold—just extreme temperature research in general, or would you say maybe when the Mercury Project took off, that your focus switched more towards reentry temperatures and things of that nature?

Veghte: I think my experience at the Aero-Med lab at Wright Field was primarily heat. And yes we did some cold water exposure, for example I was involved in designing a new life raft for NASA and that was primarily cold. It was a three-man life raft, which was a little bit different than the small dingy or single aircrew member thing. So we went down to Eglin Air Force Base, went into minus 65 degree chamber they had down there and floated around in the life raft and did some things, and interacted with the capsule. So there was that interest, that kind of was a—if I had to prioritize things I would say the heat was the major thrust of all our research at Wright Field, but there was a cold water component also. And at the Arctic Aero-Med lab it was mainly the cold water took a little more important role, played a little more important role, because the aircrew members are flying out of Islson or Anchorage, across the water, they’re doing sorties over there. So there was a strong interest by the aircrew members and just what to expect and what the exposure suit would do. And we went and I parlayed the information and the technology for monitoring people through the lab in Alaska. And we went down to Valdez and jumped in—the Lab had a small quanset hut down there and we jumped in the water just to test some various exposure suits and survival equipment. So it depended on where you were and what the aircrew’s concern was.

Pasi: Why did they send you up to Alaska?

Veghte: This is my interpretation [laughs]. I was coming up on six years at Wright Field and usually you had—I became regular Air Force which is a little different than being a reservist, so my career pattern probably was looked on and directed by others higher up. And so it was time for me to move on. The Arctic Aero-Med lab was established by Brooks in the late forties. And so it was felt they could use my expertise and a slot came open, and I became, well they call them departments up there, but it’s like branches of the protective clothing branch at the Aero-Med lab.
Pasi: Chief of the Protective Clothing Branch.

Veghte: Yeah, whatever. Titles weren’t that important; it was just there. I don’t know the mechanics of why I was selected for that, but I went up there.

Pasi: You weren’t looking upon it with dread or trepidation.

Veghte: No. It was another—it turns out—I viewed it as almost like boy scout experience. All our testing up there is done in the winter time primarily. Our test parameters are minus 45 and below. The coldest temperature while I was up there was minus 70 degrees F. It’s a different environmental stressor. And so we learned a lot. And I was in charge of a group of about three or four old-time survival people. They came out of the Second World War. They were parachutists; they could survive anywhere. They taught survival training at Stead Air Force Base. And so here’s this brash captain coming up trying to teach them how to use rectal probes [laughs] and why we need to use rectal probes. So we developed a very small tightly knit group that we exposed everyone to, all these parameters.

Pasi: And you worked with those same gentleman throughout your stay there primarily?

Veghte: Oh yeah, they were unique individuals I’ll tell you.

Pasi: They sound like the toughest of the tough.

Veghte: They were. And one of the things we did was to go through a simulated survival experience. We did this in the summer time; we did winter time, but this summer time we would just take a survival kit out of a fighter and walk from the Brooks Range up the Arctic Ocean or the Beaufort Sea and just see what the problems were testing new equipment and everything else, which was kind of interesting. [laughs]

Pasi: Dr. Veghte our first tape is running out of time now, so this might be a good time to take a time out and switch tapes.

Veghte: That’s good I need a drink.

Pasi: And we’ll resume in a second or two.

End of Tape 1

Beginning of Tape 2
Pasi: Once again the day is Wednesday, December 12th 2007. We are talking with Dr. James Veghte. Dr. Veghte I’d like to maybe discuss now if possible, or hear you discuss, your promotions throughout your career in the Air Force. It seems like you moved into more managerial positions. I see Chief of the Department of Protective Equipment, Chief of Baro-Thermal Environments, Chief of Environmental Physiology Branch. As you progressed career wise, vocationally, how did your job duties change, or did you make sure that they didn’t change that much?

Veghte: Well of course you have added responsibilities of managing people and that was one of the major shifts I think. I was involved in looking at the overall research programs within our purview. One of the reasons I didn’t take any other managerial jobs was personal; I wanted to stay in research and be able to do research myself. And so I purposely stayed where I did and not advance any further. And I made those wishes known. So I just stayed at a working level because a branch is kind of a working level really.

I went through a lot of schools. I went through Squadron Officer’s School and a lot of in-house training on how to manage people and resources. So that was kind of a progressive type of a learning experience for me and training. It never stopped. I was always happy really personally doing research, trying to solve problems and find out what the problems were.

Pasi: And there wasn’t any push from some of your superiors to move more in that managerial…

Veghte: It was approached at times, but they just said “ok Jim you want to stay there… o.k. we’ll let you stay.” So my career from ’54 to ’59 was spent at the Aero-Med Lab at Wright Field. Then I went up the Arctic Aero-Med Lab from ’59 to ’63 and then came back to the Aero-Med Lab in ’63, went to school from ’65 to ’67; came back to the lab until the end of my career. So the available positions for a researcher, in research were very limited unless you wanted to get into management area, which I didn’t.

Pasi: And so your upper degrees were not management degrees in any way? They were also biological?

Veghte: Yes. I’ll put my ending statement right now. I want to thank the Air Force for allowing me to pursue my academic career. I got my masters at the University of Alaska studying the thermal regulation of Grey Jays, kind of like a Blue Jay, cousin [laughs]. And then I went to the University of Michigan and got my doctorate after a lengthy research program in environmental physiology. And this again was the thermal
regulation of ravens. So the Air Force has these opportunities and was very kind to send me there.

Pasi: Now you were working for the Air Force in human physiology, but your degrees and your university research was directed more toward animal physiology. Did they say “hey Veghte, what are you doing?”

Veghte: No they never—no one ever said that. Maybe they never knew, I don’t know. No they never said that. But physiology is physiology. The various thermal regulatory processes might vary. In other words, we’re a sweating body, but the principles are the same. If you study thermal regulation in birds, you’ve probably pretty well covered it, although they have some dissimilarities, if you will. But I didn’t find the transition uncomfortable at all.

Also I became involved in something called Project Themis. It was at that time a DARPA project where people with work experience in the Air Force, civilian and military—in this case it was military—to visit the major research workers in their area in the country. So every year I would visit and review the research programs or contracts the Air Force or DARPA had with University of Illinois, Sid Robertson at Indiana, Steve Horvath in Santa Barbara, John Hardy at Yale, places like that. And it was very stimulating because you get a lot of different inputs and ideas, and you’d say “I have this problem…”

Pasi: And was this specifically related to aerospace medicine?

Veghte: Yes, in thermal regulation. They’re modeling, modelers. They’re into all areas of thermal regulation, the sweating mechanism, exercise, so some more basic things. And it was very stimulating.

Overlaid on this, as I alluded to earlier, we were a very tight knit group and we were very conversant with the Army, what the Army was doing; what the Navy was doing, out at Stohol. We visited; the money was available to go and visit periodically, at least once a year usually, or if some project was going on that they needed some equipment like the infrared camera that I hadn’t mentioned. But it discerns the temperature difference, non-contact of clothing and things like this. We used to travel with this to the Army and do a specific study and with the Navy too. We went to Royal Air Force research facility at Farnsboro, England. So overlaid with the civilian input there is the counterpart military input. It was very, very rewarding and very exciting really. So there was that type of responsibility and work experience that you’d gather and then tried to convey this through your research projects.
Pasi: You mentioned visiting universities and I guess that brings up a question for me. Would the Environmental Physiology Branch in any of your research ever contract work out as other laboratories did or other divisions?

Veghte: Yes, we had contractual effort. But the focus changed at least in my perception from the later outsourcing type of process. You were given contracts to monitor. And with your work experience, at least in my area, you were the directors; you knew what was going on and you directed their research. Since some of it involved basic research, like say exercise physiology, it played an important role. You could kind of direct research a little bit. And you also wrote the mission statement and stuff for the contractual effort. Later on with the outsourcing you started losing the experienced people at the lab say, or in my group. You started losing those experienced people and you became more unfamiliar, or unaware, of where the contracts were, what they involved and the things like that. And that was the importance I felt of the training you received from your mentorship and everything as you went through your career at the field.

Pasi: So you’re saying that at one time there were just a few contracts that would go out to others but they eventually became more the rule as opposed to the exception? You talked about outsourcing became…

Veghte: Well let me see if I can explain it or get my thoughts. There was a great deal of resistance to outsourcing when it was first proposed.

Pasi: And again by “outsourcing” you mean simply getting an outside contractor to do the work?

Veghte: Yeah, to do the work, or do the study. And the fear was, and I think it’s been realized to some extent but I don’t know because I haven’t been involved with the field for so long, that you lose your in-house experience because you don’t have the human experimentation, for example in our area. But that’s just a personal feeling I have, or thought that I have, I really probably shouldn’t even mention my feelings on it. [laughs]

Pasi: Did you witness that first hand?

Veghte: No because I left when I did.

Pasi: And it was beginning to change?

Veghte: Yes it was just beginning to change. But I know the makeup of the people in the lab.
Pasi. Well why did that change? Why did the Air Force eventually start to say we can do this outside? Was it cheaper? Was it cost-effective?

Veghte: [laughs] The reason we heard is cost-effective. That’s what we heard. Whether it was, I don’t know.

Pasi: Why would you contract jobs out even during this heyday

Veghte: If you could do them in-house? I don’t know?

Pasi: Why did you in your work do it even during that heyday?

Veghte: We did it originally so that we could tap into the academia world, the people that that was their specialty in thermal regulation for example, or modeling of the human body. The expertise didn’t exist perhaps in those special areas, but it also provided an insight into the type of work that we were trying to do and also an interpretation of some of the results. It was there in place when I came to the lab, so I think it was always there from an early period.

Pasi: In any of this research or projects that you were working on, was there ever a push for some kind of dramatic breakthrough, whether for Mercury saying “hey we’re going to send these guys up in a year from now, we need to have this done.” Or maybe during the Viet Nam War were there ever instances where there was a very real tangible necessity that had to be met very quickly.

Veghte: I think you touched on one example would be the Project Mercury, because there is no information. They’re scared to death of what might happen and they wanted to know—be provided with some information. I don’t think I mentioned—I’ve done so much talking here [laughs]. I don’t think I’ve mentioned this study that I was aware of, even though I wasn’t involved in, in describing the safe distance from nuclear blasts that occurred, the thermal profile associated with the blast. A person in our group, Bill Kaufman got a hold of a F-100 that pranged as they say and put it into a large building down in the flight line where they test to destruct; they put hydraulic jacks and break wings off and have a lot of fun. He built some quartz lamp apparatus over the cockpit, put a person in, and then studied, well duplicated, a thermal profile associated with a nuclear blast, various distances just to see what the tolerance limit, or tolerance envelope was. And at that time there was what was called a “lob maneuver” where the B-47 would go up and lob or toss the nuclear weapon toward the target and fly the other way. And he developed this envelope. So there was a push for this type of information. Now the other stuff, the cold water immersion was kind of a not so—well it was important at least to us it was, but it wasn’t the strong push to get an
answer right off the bat. So it was kind of a back-burner type of thing in that area.

Pasi: You’re kind of unique to our interviewees here because you were regular Air Force for quite some time.

Veghte: [Laughs]

Pasi: And most of our interviewees have been civilian, civilian leadership, civilian engineers. Wright-Patterson is unique because of its heritage from the earliest days of military aviation, because there has always been a significant mix of civilian and Air Force there. How would you describe that work environment in your experience?

Veghte: Well all I can say is based on my personal experience. As I mentioned we had a number of Paperclip scientists; we had civilians working a long time in our area and there was never a problem at all. Getting the job done was the primary thrust. We all worked together, we shared information together; we shared experiences together. So I always felt that the Civil Service provided a continuity across the short term the military had at the various labs, so they were extremely important to me. Both as mentorship and providing this long view of what was going on and how to do a certain—oh you want some money, here’s how you do it and that type of thing.

Pasi: Well that brings up another good question, in my opinion. Maybe not. You’ll be the judge I guess.

Veghte: [laughs] Ok.

Pasi: You talk about the continuity of the Civil Service whereas the Air Force it seems is every few years is changing, rearranging, shifting, changing titles of organization; it gets into this vortex of alphabet soup. How would these reorganizations affect your work if at all?

Veghte: Well I think there is a in my conceptual picture of what’s going on there’s a lot of rapid transition in terms of change of titles among the higher echelon wherever it occurs, with the military, the Pentagon, the political arena, whatever. But to get trickled down, it slows down and when it gets down to a working level, yes we were aware of it, that changes in primarily funding was going to happen and how to adjust to that would cause some changes I guess. In terms of research you know bodies are bodies; people don’t change, at least not that rapidly. And the flight environment is pretty much the same. Now if the flight environment changes from manned aircraft to drones that would be a dramatic shift and would affect the research of the Aero-Med lab although they are doing studies on how to control the drones and things like that. So I would say
that yes the changes occurred; they affected us in terms of titles of our
groups, maybe a branch name would change or something. But in terms
of the basic research over my short time at the Lab which encompassed
twenty years or so, I didn’t see much change.

Pasi: You mentioned drones and unmanned aircraft; I remember a
significant project in the early sixties was project forecast. And if you
read some of the articles from the 1950s there is a focus on weapons and
aircraft of the future. Were unmanned aircraft ever something that you
took seriously as possibly a threat to your job.

Veghte: No. I never felt a threat to my job [laughs]. But maybe that’s the
egocentric personality.

Pasi: Seems like you could have shifted directions and found something.

Veghte: That’s right. Flexibility, that’s one of the key expressions.

Pasi: Well Dr. Veghte you were at Wright-Patterson Air Force Base and
other places in the Air Force for several years during the Cold War. Could
you estimate for future historians the value of Wright-Patterson during this
time?

Veghte: That’s a big question. All I have as a frame of reference is
Wright-Patt Aero-Med Lab and visiting other places, but to me it’s one of
the most critical or most important research facilities the Air Force has in
terms of personnel, in terms of equipment. When you just go around
Wright Field, or Area B and other Areas, you realize the tremendous
investment just in the facilities to be able to do this research. And if it
isn’t available it becomes available. But of course the most important
thing are the people. In any endeavor the people are the most critical
resource you have. AFIT, for example, training, it’s just beyond measure
what they have done. At the University of Michigan I came in contact
with forty odd aero engineers and you wouldn’t believe the minds they’ve
tapped into to send for master’s usually in aero engineering. And just to
have that capability and farsightedness to train their people is just
insurmountable. I don’t know. It’s hard to even imagine the impact this
has with the future direction of research in the Air Force because they go
all over the place, pilots, engineers. It’s amazing. I feel very fortunate to
be a small part of this history really, what’s going on. In terms of the Cold
War, I think it made a tremendous impact. I cannot—I wasn’t aware of it
because I was a very small niche down there, but I can imagine the impact
that it must have had on the direction and everything else of the Cold War.

Pasi: Now I know you’re a man of humility, but what do you think one of
your significant contributions to your work was at this time.
Veghte: I have no idea. [laughs] You have to realize that science is building on the shoulders of a great many people. And the importance of the particular work that you do is—perhaps you’ve advanced the science a little bit, but you’re built on the shoulders of many, many, many, many people and the work that you do becomes part of this pool of knowledge hopefully. Then someone is going to build on that depending on what the area of interest is. I don’t know; I don’t take myself too seriously. I’ll put it that way. I had fun. And I was given a great opportunity and I hope I’ve repaid it back, that opportunity, in some way.

Pasi: Before we go, I don’t want to forget to bring these up; I know you did some work in Norway at one point I guess for NATO is that right?

Veghte: Yeah. I became involved with the training of flight surgeons in NATO. We interacted at various meetings, NATO meetings and everything. I became a spokesperson for my area of specialty. With my Alaskan experience and everything else, we trained flight surgeons up there and aircrew members and all kinds of survival techniques. That became a study that took place by NATO over in Norway. And we had a group of flight surgeons from NATO, all over NATO who participated in the study as both a classroom and an actual field test. We went out and lived snow caves for a couple nights. So there was that involvement and that cross-fertilization of information on a more international basis that couldn’t have been possible without the work experience started right here.

Pasi: Now you say you trained flight surgeons.

Veghte: Yep.

Pasi: You’re not an M.D.

Veghte: No

Pasi: What would that training look like coming from you; what role would you play in that training?

Veghte: Well they have there—how can I explain it? It never came up. I first encountered this a little bit here in early stages at the Aero-Med lab. At the Arctic Aero-Med Lab we had all the flight surgeons, new flight surgeons that went up there for survival training. And they quickly became very humble in terms of how they knew how to survive at you know, minus 40, minus 30 whatever. And most of the people—flight surgeons are by and large, at least the ones I’ve been exposed to, are very accommodating to new challenges and ideas. This is an area they don’t
know too much about. They’ve been told going through flight surgeon training, aerospace medicine, a lot of classroom stuff, but to actually be exposed to some of the things that aircrew members might be is very limited. They don’t go through Stead, the survival school usually. So I didn’t have a feeling of any animosity or anything. I was relaying information that they didn’t have, so they accepted that. At least that was my feeling. What they said over a beer, when I wasn’t there, I don’t know. But anyway [laughs]

Pasi: I know throughout your career too being the researcher that you are, you began to compile data for future researchers. Could you talk about that a little bit?

Veghte: Well when I came back after I was out of the military, I came back to Wright Field. After a year you were allowed to come back as civil service. And I came back. Since the thermal research area had been moved to Brooks, I came back in acceleration physiology and did some work with primarily animals with the centrifuge.

But anyway I still had this tremendous mass of information. I’m just a collector and everything on thermal regulation both with people, clothing, animals, I had all these reprints, thousands of them. And I began putting them into a database. I became a resource, a library resource, which I think you can appreciate. People working in an area, they would say “what information is available in a given area,” say like temperature regulation of birds, just for an example. And I would extract that information and send it to them. So that was kind of an ancillary interest. I don’t know whether the Air Force had any interest in it, but I did and so I was allowed to do this.

Pasi: And when you left civilian work did that leave with you or did somebody else take over the project?

Veghte: It wasn’t a contract; it was an in-house effort.

Pasi: O.k.

Veghte: No I think that was dropped. [laughs]

Pasi: You mentioned coming back as a civilian doing work with the centrifuge what type of work were you involved in there?

Veghte: Mainly looking at the effects of G-Forces, various axis of G-Forces on animals. The lab had quite a few primates at that time and they were doing some work that humans—they felt was too dangerous for humans. So the D.E.S. or centrifuge over in Building 33 had on one end
for humans, on the other end they had a platform for animals. And we worked with veterinarians and everything on looking at some of these parameters.

Pasi: Now was that for a particular new system that the Air [Force] was developing for a plane that was going to have a higher G Force than other aircraft.

Veghte: Yeah. They were always pushing that envelope, yeah.

Pasi: And do you remember what aircraft that was in particular that they were trying to do the research on?

Veghte: Nothing comes to mind right off hand. And I don’t know whether it was restricted just to aircraft. I just can’t answer that I don’t think.

Pasi: Well Dr. Veghte as we come to a close here, I’d like to give you the opportunity to discuss any thing you feel that we may have glossed over today that you’d like to put down on record.

Veghte: No, other than it was a very exciting time. You met a great number of very talented, specialized, trained individuals in the Air Force. And it was a wonderful experience for me and I still treasure it. And happy to have the opportunity to perhaps relay some of this information in the future generations. I don’t know where this is going, but who knows?

Pasi: Let’s hope it doesn’t stop.

Veghte: I think Wright State is doing a wonderful job archiving because everyone has a story to tell and you’ve heard several I’m sure very important contributions to this area.

Pasi: Well thank you for being here with us today; we appreciate your story.

Veghte: Ok, well thank you.

End of Tape 2