NATIONAL MUSEUM OF THE UNITED STATES AIR FORCE

Wings & Things Guest Lecture Series

Air Superiority in Korea

Dr. Kenneth P. Werrell discusses the Korean War, which saw the first largest jet-versus-jet fighter conflict of all time. Despite many disadvantages, American pilots won an overwhelming victory, which was critical in the outcome of the war.

Dr. Kenneth P. Werrell: Thank you very much. It's certainly a pleasure to be here and an honor, because I know of the high standard and caliber of the speakers you have, and having gone through the Korean War exhibit, I also know the high caliber of your exhibits. I would like to thank various members of the staff who treated me so well here, and have done such a good job making a contribution to air power history. And I especially want to thank Brett Stolle, over at the Archives, who have been a great help to me, not only this week, but in the past endeavors.

Well the Korean War came as a great shock to the American public, and is truly a forgotten war wedged between World War II and the Vietnam War. It was the first jet-to-jet aerial war; it was the largest jet-to-jet aerial war in terms of planes and of losses. But the battle for air superiority was the one bright spot in that conflict. And of course the star of that conflict was the F-86, in my view, one of the prettiest airplanes that ever flew, an elegant aircraft, high-performing and it proved itself in combat. The pilots of that airplane were celebrated, were made heroes, as were the pilots of World War I and World War II.

And if I can take a moment for a little personal note here, I was an aviation enthusiast as a kid, making models, joining the civil air patrol and the rest. And I knew of the F-86, but I didn't get a glimpse of it until the summer of 1956 when I was standing on the ramp at Laoui Field and an officer leaned over and in a stern voice said "Gaze, Gentlemen, Gaze," and it was an F-86 landing. A most impressive sight. A number of those officers had served in Korea, and a few of them had actually registered some claims, which was very heavy stuff for a 17 year old. And you might understand why I as well as most of my classmates wanted to be fighter pilots. So that's kind of the background to my connection with the F-86. I never got to fly it, I never became a fighter pilot, but I still have this feeling of nostalgia.

Tonight, I want to move the discussion beyond what I think is the normal view of the war which centers just on the aircraft and the machines. I hope to move it up a notch or so to talk about some of the myths, some of the claims, some of the mysteries that are involved in this endeavor.

I want to discuss some of the recent scholarship and I hope that we eventually can get around to answering many of the questions.

Well, the first thing that I want to do is to try to put this into context. Because I don't want you to get the idea that the only thing that happened in Korea had to do with the F-86. There was a lot more going on. And we can see this numerically in that the F-86 action, the air superiority action, was only a small part of the air war. In terms of sorties, the air superiority sorties were only 3/4 the number of close air support sorties. And the air superiority sorties were only 1/3 of the sorties that the Air Force flew in interdiction. So it was a very small part of the war, but a very important part of the war. And in terms of flying hours, the F-86 only flew 3/5 of the flying hours as did its two rivals: the F-80 and F-84.

In losses, the F-86 units only lost 1/3 as many casualties as did the F-80 units and only 1/2 as many as the F-84 units. So you can get some idea, I hope, the context of this story. Well, the F-86 started off as a straight-wing fighter and as you can see looking very much like an F-84. And probably had it gone into service this way, would have performed about that same way. North American realized, this and building on information that came out during the war through wind tunnel tes,t and particularly with the experience they gained from the ME-262 which saw combat in World War II. They innovated by sweeping back the wing.

The other influence of the ME-262 on the F-86 had to do with using wing flaps which is as many of you know is an extension of the leading edge which at low air speeds extends forward which lowers the speed that's required for takeoff, landing and approaches which made it a much safer aircraft. Clearly there was a German influence with the F-86.

The F-86 first flew -- I'm going the wrong direction here. Well, someone's going to have to give me a hand. Well here we go. Sorry, I hit the wrong button.

So this is the model that first flew. This is the experimental F-86 that first flew in October of 1987. You can see it's a bit of tube and the fact that it does not have any armor. It was flown by the man on the left, a North American test pilot George “Wheaties” Welch and in the photograph with Gabby Gabreski. They both flew on the 7th of December, 1941. Gabreski did not get any claims that day but”Wheaties” Welch claimed four, was nominated for Medal of Honor which he did not get, and Welch goes on to claim a total of 16 Japanese aircraft on 348 combat missions.

I should also mention that this time, there are also indications that Welch also got the F-86 through the sound barrier two weeks prior to the better documented and the more famous flight by Chuck Yeager. He did this in the dive because the F-86 could go supersonic in a dive.

There are three variants of the F-86 that flew in Korea. The “A” Model which was superseded by the “E” Model in 1951. The “E” Model looked the same as the “A” Model, weighed about 480 lbs more which decreased performance but it had an off flying tail that is that when the elevator was depressed, the entire horizontal tail moved which gave the aircraft more maneuverability than the previous model. So although there were some tradeoffs involved, it was a better handling aircraft.

The third variant was the F-86F which comes into service in mid-1952, and it was the new improved version, and had a more powerful engine. It also had a redesigned wing. The wing was the so-called 63 wing which was 6 inches longer at the cord. It was 3 inches to tip so slightly larger. It deleted the wind flaps and as you can see the corner here, it had a small wing fence. This improved its performance. However, it also increased its stall speed by about 29 knots. But as one pilot correctly noted, you don't win dog fights in a traffic pattern. This was the ultimate F-86 that saw action in Korea.

The F-86 was well known as an honest aircraft, a fine aircraft but there were flying safety issues particularly when the Air Force was transitioning into jets at this point. The F-86 had a particularly weak nose gear which caused problems, but I would point out to you that as this graphic I hope makes clear, the F-86 had the best flying safety record of those jets. As you can see on the right, whatever metric you used of major accidents or fatal accidents or wrecked aircraft, it was a much safer aircraft than either the F-84 or the F-80, its two rivals at that time. And at approximately the same flying safety record as the F-51 which was the standard Air Force fighter of the day.

A number of efforts made to improve the performance of the F-86. There was an effort to reduce its weight. There was an effort to tweak the engine by adding alcohol water injection. There was an effort to add liquid rocket engines. There was also an effort made to put air-to-air refueling. They tried both the probe system and I know that occurred during the Korean War. At some point, because this photograph is undated, they also tried the flying boom system. None of these systems were put into effect in the F-86 during the Korean War, although air refueling was used by other aircraft.

Another effort that was made was with fellow rocket propellants in the summer of 1952, they attached three 1000 lb rocket boosters to the F-86 and if these were fired simultaneously, they could boost air speed by 20 knots for 16 seconds. They flew these on 300 missions on which about 6 MiGs were knocked down, 2 of which were attributed to having this extra power, but for a variety of reasons that were not put into service.

A second effort that was made, that was combat-tested, was to up-gun the F-86. The F-86 initial armor was six 50 caliber machine guns which is the standard armor from World War II. I think here the Air Force has to take some hits for not including the armament because from the very start in Korea, pilots complained that they didn't have enough fighter power. So the effort that was made was to upgrade it with 20mm cannons in project Gun Valve in which they put four 20mm of cannons of German-designed on the aircraft. In early 1953, these were combat-tested over Korea. On 284 missions, they knocked down 6 MiG's but the 20mm proved to be less reliable than the 50's and the 20mm had an additional problem which was from the gun gases. The 20mm generated about 4 times as much gases as the 50 calibers and there were 20 instances of the engine stalling out. One aircraft was lost because of this. And it turned out once again; the Air Force had messed up. They had tested project Gun Valve over the States and only up to 25,000 feet whereas the aerial combat in Korea initially took place at much higher altitudes where stalls are much more likely to occur. So the 20mm were not put into

service in Korea although they later were to arm the F-86H in the course of other Air Force aircraft as well.

Another technology that should be mentioned that is important was the installation of the radar ranging gun sight into the F-86. These were hastily took over into theater and put into service and the haste turned out to be detrimental in that the gun sights proved to be unreliable. Unreliable because of a lack of parts. Unreliable because the pilot's weren't properly trained in the chutes and the maintenance people weren't properly trained to that a whole bunch of problems with this device. Although when it worked, it really helped a lot.

And then we had an interesting incident when older pilots who were Aces were asked about this gun sight and what they should do about it. They want to get rid of it. They thought it was just 200 lbs of extra weight and really wasn't necessary. And Gabreski, the top American Ace in Germany in World War II, supposedly said, "I can put a lot of chewing gum on the windscreen and do just as well," and he probably could but the younger pilots, the younger Aces, they were all for this and they made the point that for the average pilot, that this gun sight would make them better marksman without having all the experience. So this caused some real problems but the Air Force did hold on to the gun sight and it proved out in the long run.

The other innovation that was used which was a great advantage for American pilots in Korea was the G-suit. The G-suit which inflates when the pilots pulls harsh maneuvers to prevent blackout was pneumatically inflated around the waist, around the thighs and around the calves and it increased the pilot's resistance to G's between 1 to 2 Gs. What's significant here is that the F-86 had this radar-ranging gun sights and our pilots had G-suits. The pilots that we faced had neither which gave us a significant advantage. An advantage which can be seen by the fact that the one thing that the Russians wanted most was to get our gun sight and to get our G-suits, which I think I find very interesting.

Well, on the other side of the hill, the Soviets were building jets as well but they get into the game late. They don't fly their first jet until April 1946 but then all of a sudden they receive a bonanza from our ally the British who in September 1946 sell the Soviets their top of the line, state-of-the-art jet engine which is going to go on to power the MiG 15. And the MiG 15 first flies in December of 1947, only a few months after the first flight of the F-86.

And these two aircrafts, on a number of ways are similar, both having a sweep wing of 35 degrees, both having a nose inlet, but this photo doesn't really show it clearly. The F-86 has a low-mounted wing. The MiG 15, a mid-mounted wing. The MiG has the wing fences and also it has the horizontal stabilizer halfway up the vertical stabilizer.

The MiG 15 was red-lined at 0.292 Mach so it could not go as fast as the F-86. And when it approached its red line, the controls became stiffer and stiffer, and it was a much less stable aircraft, whereas I've already mentioned the F-86 could exceed the speed of sound in a dive. The MiG also had handling problems, it apparently was a tricky aircraft to fly,

it stalled easily and went into vicious spins. In '52 and '53, American pilots reported seeing 56 MiG's fall into spins, and they reported of those 56 incidents, that 35 of the pilots either bailed out or were seen to crash. So this was an airplane that was tricky. But it was in the Soviet style, it was simple, it was rugged, it was effective, and for the task for which it was designed - it was designed as interceptor, it was designed to knock out heavy bombers, it was designed to knock down B-29's - and in Korea, it did just that. It was armed, and it had an armament problem as well, it was armed with one 37mm and two 23mm cannons, so it's kind of curious that both aircraft had armaments which were less than fully effective. But nevertheless, the MiG-15 surprised the west because it turned out in a number of areas to have superior performance to our best aircraft, the F-86.

Well, I won't recap the entire Korea War for you. And again, I want to compliment the curators here for the excellent exhibit. I went thru the exhibit this morning and I'm trying very hard not to be redundant because they've covered - they've taken/stolen most of thunder here. And very effectively.

Anyway, we quickly gained air superiority after our ground troops got thrown back. The North Koreans had about 120 World War II aircraft and once we got into the fray we quickly wiped them out and by the end of July had complete air superiority. The war turned around when UN forces landed in Inchon on the 15th of September 1950. And McArthur say's "the war is going to be over by Thanksgiving, and the troops will be home for Christmas." And of course that didn't prove to be case, when the Chinese intervened massively in November 1950 with ground troops covered by the MiG-15. And most of the fighting that were talking about took place in this area, the stripped area, which is known as MiG alley.

The first MiG's were seen on 1st November 1950. They were very quickly seen to be superior to the aircraft we had in the theater, both the prop-powered fighters as well as the straight-winged jets. And I guess I need to pause here very quickly, we now know that these aircraft were piloted by Soviet pilots from regular Soviet units. The myth at the time was propagated at that time for diplomatic reasons, and I think lingers in the mind of many people, that it was mainly Chinese pilots with a few Russian instructors. We knew as early as March of '51 from the radio intercepts, that these were Soviets. So initially we're going head to head with Soviet pilots, many of whom were veterans of World War II, and well experienced.

On the 8th of November of 1950, the first MiG-15 is shot down by an F-80 pilot. And on that same day, the Chief of Staff of the Air Force, Hoyt Vandenberg, orders and F-86 unit to go over to Korea to make sure that we had the balance of power. And they send over the 4th Fighter Group, which the linear descendants of the famous Eagle Squadron from World War II. And the unit which in World War II is given credit for destroying the most German aircraft in the air and on the ground. So they go into action on the 15th of December. And then on the 17th of December, the figure in the middle, Lt. Col. Bruce Hinton shoots down the first MiG to fall to an F-86. The first of many.

From the outset, we are terribly surprised to find the MiG has performance advantages over the F-86's. Because the two airplanes are powered by engines of similar thrusts, and the MiG is lighter than the F-86, it has the advantage of greater acceleration, of superior rate of climb, and particularly, superior ceiling. The F-86 has the advantage, it can out dive the MiG, it has better speed brakes, it has better visibility with its canopy, and particularly its defrosting system-which you might think "that's kind of a simple ... you know.. why would you mention that?"- but when you're going from 40,000 feet down to the deck in very brief time in humid conditions, and your canopy frosts up ... Then you're in very big trouble. Our defroster worked, the MiG-15's did not work very well at all.

So there were a number of advantages that the Saber had, particularly that it can transition from one maneuver to another quicker. It had better controls.

On the 28th of May 1951, James Jabara becomes the first American jet Ace, when he shoots down two airplanes, two MiG's despite the fact that he had a hung up wing tank, which by policy, he should have aborted the mission. But does not, and he gets the accolade of being the first American jet Ace.

Now the battle for air superiority increases as the Communists pumped in more aircraft. The Soviets are joined by both Chinese and North Korean pilots towards the end of 1951. And to right that balance, we send over the F-86E, which I've mentioned the upgrade to the original F-86, in mid-1951. And then in December of 1951, a second F-86 unit is formed and this is the 51st Fighter Group which is distinguished by the checker board tail. It had been an F-80 outfit, and they had been transitioned into F-86's. So we upped the ante, and now have two F-86 fighter groups that are involved.

Well, the increase of numbers and the introduction of the F-86E lead to the fact that we are able to knock down greater number of MiG-15's. And this graphic, I hope makes this clear. In 1951, we knocked down an average of 18 MiG's a month. In 1952, we knocked down an average of 31 MiG's a month. And in the 7 months of 1953, we knocked down 41 MiG's a month, with the top month being June of 1953, right before the war was over when we claimed 78. So these were two factors to that worled, F-86s, F-86E. Other factors were the fact that Russians were rotating out there with more experienced units and the new pilots that were coming in were less experienced.

The Chinese, the North Korean pilots were less experienced, so these all play a factor but I would emphasize another factor which is not well known by most people and that is the intrusions of American pilots into China. Now the conventional wisdom holds that there were some intrusions, but these were done by either rogue fighter pilots or MiG crazy fighter pilots, or some poor guy who's lost in the weather and mistakenly crossed the river. But it was infrequent and it was only done by accident. That's not the case.

Our intrusions to China were frequent and they were well known by the high command up through Tokyo. Now, one of the F-86 group commanders recounts the story that he was called in and chewed out because the reports that the F-86 had gone into China. And after General Everest left the room, he sighed a sigh of relief. And Everest apparently

pokes his head back in and points his finger at poor Colonel and says, "Damn it. If you're going to fly into China, turn off your damn IFF." The IFF of course is the Identification Friend or Foe, a radar device which allowed, if it was turned on, allowed ground stations to know where American pilots were.

So Everest knew about these intrusions, field great offices, wing commanders, group commanders, squadron commanders, not only condone this but they led missions into China. So there were a lot of action over China.

My research indicates that probably half of our Aces, half of the 40 F-86 Aces claimed at least one MiG over China. Of the 11 top Aces, these are the ones who got 10 or more victory. Nine of the 11 got at least one victory. This stock is not documented you know. So we didn't have any documents but I interviewed about sixty F-86 pilots as well as get to read their memoirs. You'll see this.

Some of these pilots believed that they had the right of hot pursuit. Although that was approved all the way up of the chain of command, it was never approved from Washington. They never had the right of hot pursuit. So there were a lot of intrusions. From what I've been able to find out, possibly only three pilots were punished for flying into China. Documentation is sketchy but apparently, Joseph McConnelll who I'll mention a little bit later apparently was grounded for two weeks. Another Ace, Double Ace Lonnie Moore was sent home very rapidly for having gone into China.

Again this is sketchy. The third instance Dolph Overton, we know more about, because I interviewed Overton, face-to-face. Overton had flown one tour in F-84s and then gone into F-86s. He goes to a radar station and sets down at a radar set and figures out where the Communist landing pattern is. And what he does, he goes up and he starts to orbit the Chinese landing pattern and is therefore able to shoot down five MiG’s in four days. He becomes the quickest Ace but unfortunately for Overton, his timing was bad.

And as you know in life, timing is probably everything. Turns out that on one of these days, a squadron commander had been shot down 100 miles inside of China so that got people's attention. The other fact was that on one of these missions, a UN pathfinding team was travelling across China and they look up and there's a dog fight going on in China. So they send rockets and of course you know it all goes downhill, and a staff officer from Tokyo comes over and interviews the pilot that flew that day and when Overton was asked, “Did you fly into China?" He admits that he did. They shipped him home immediately. They strip him of his medals which he did not get until about a decade ago. They even get rid of his kill credits as well, but that's the only instances I know of pilots being punished.

Okay, another part of the story which you know part of, because the museum's part of the exploitation of this equipment by both sides. In April of 1951, we found out that a MiG had crash landed deep inside of North Korea. Now 35 miles inland, and north of Pong Yang. We sent in a team that have been especially trained and they go about ripping apart the engine and parts of the engine. They get the whole [Inaudible] into this helicopter

before they come on the ground fire until they scooted out of there. Then a couple of months later, in June of 1951, another MiG is seen to go down in the mudflats of North Korea, so we send in a small of group of naval vessels. Royal Navy, U.S. and ROK and these poor photographs are of them salvaging parts of these and they're able to get out essentially the engine so we were able to get some pieces of the MiG-15.

But it's not until March of 1953 that a Polish defector brings a MiG into Denmark. Our intelligence people got a hold of these photographs. They disassemble it and then reassemble it before they gave it back to the Poles. So that was the first one we got to see up close and personal. Perhaps as a result of this, the next month, in April, 1953, a project is started in the theater called Project Mula where we offer $100,000 to a Communist pilot to bring in a MiG. And we drop a couple of million leaflets all over the place. And low and behold, in September of 1953, a MiG-15 lands in Seoul, and I might quickly add that the pilot indicates that he'd never heard of Project Mula. That was a complete surprise to him. And that MiG was quickly taken down to Okinawa and flight tested. You can see here with the F-86 chase plane by five American pilots including Major General Albert Boyd. And you know here, and I want to bring this up too that it was repainted in American markings at this point. And I don't know how long it stayed in American markings but as you know, this is the airplane that's currently on display not too far from here back in its North Korean markings.

What we've found out is that the Intelligence we had was pretty well confirmed about the MiG's advantages and disadvantages. The great story that I won't go into details but Chuck Yeager tried to get the MiG to go supersonic because there were rumors it would go supersonic. Took it up to the highest altitude that it will go at, full power. He doesn't go straight down. He goes down at an angle because the nose tucked under and tried to get it supersonic and it wouldn't go supersonic. And I guess he was lucky to survive.

The Communist tried to get F-86s, as I mentioned they wanted the gun sight, they wanted the G-suit but they wanted an F-86. They organized a unit in April of '51 of test pilots trying to capture an F-86 and they failed miserably at that. But then a few months later, in October '51, an F-86 got shot up, the pilot can't eject so he's forced to crash land the F-86 on the mud flats. The pilot is rescued, but the Communist got the entire aircraft and we were able to take it back. Later in May of '52, a second F-86 crash-lands and they get that one as well. According to Soviet records, they never flew the F-86, they certainly took it apart. They examined it but they never flew it.

One last point I want to make here. There are rumors that American F-86 pilots were held after the war. This is kind of a Rambo scenario. Bare in mind that at the end of the Korean War, 13,000 Americans were declared missing in action. And I just saw a newspaper clipping couple of months ago which stated there were still 8,000 MIAs from the Korean War. At the end of the war, 220 Air Force crew members were released from captivity including twenty eight F-86 pilots. Nevertheless, there were Congressional hearings in 1996 where this issue was explored with all kinds of fragmentary third party information that pilots were seen etc. etc. but no smoking gun. And I've seen no evidence and I am going to believe that, that just did not occur.

Okay the change without much of a segway. One of the issues of the war has to do with numbers and I was always under the impression that the F-86s were terribly outnumbered in the war. Now they were outnumbered, but it turns out, not so terribly. The bar on the left is the official numbers of the blue being the F-86 sorties, and the red being the Chinese and Soviets sorties. And this comes out to an advantage to the Communist of about three F-86 sorties for every four MiG-15 sorties. Of course you have to add in the North Koreans. As far as fightings, that's an approximation but the most important is the bars on the right of those engaged and these are Air Force figures. It comes out that about three F-86's engage about four MiG-15. So they were outnumbered but it's not, you know, astronomically as you might think.

The most controversial numbers have to do with claims and losses. Now claims have always been a problem in aviation history. Understandably so in the fast action, obviously pilots have other things to do besides see what happens to the guy they just shot up. So this has always been a problem, but in the Korean War, it was an especial problem.

The bar on the left are U.S. figures. The F-86s claimed 800 MiG-15s. In addition to those 800, there were another 36 MiG's claimed by other Air Force, aircraft and then Marines and Navy pilots and Navy air craft claimed 9. But I just want you to look at the F-86s. 800 claim by then.

The US Air Force admits to losing about 210 F-86's but only about half of those in enemy action. And if you look at those numbers, and put them together, I think it's fairly certain that we lost approximately 100 F-86's in air-to-air combat or a claim to loss ratio of about 8:1. No big deal. The problem is when we look at the Chinese and Soviet figures because the Chinese and the Soviets, they claim to have knocked down 860 F-86's. Then of course you have to add on the North Koreans. They do admit to having lost about 540. My point is that there is such a discrepancy between the claims that the Soviets make and the Chinese make and the aircraft we lost. Not only they completely frustrate the researcher, but the through their numbers into discredit. So unless you believe there was a conspiracy by the U.S. Air Force to conceal F-86 losses, and I see absolutely no evidence of this and I've looked, you know, to the records. I don't believe in conspiracies whether it's Pearl Harbor or Roswell or 9-11. You can't reconcile this difference.

Okay then. So we have the issue of numbers. Then we finally get to the Aces and there's an excellent painting downstairs that you have on display which is from this photograph which is five of the top Aces of the 4th Fighter Group. And from left to right is Lonnie Moore, Vermont Garrison, James Johnson and they're actually standing in front of his F-86 so though you'll see only nine credits on his airplane. Next is Ralph Parr. Parr got the last victory in the war, a very controversial kill that took place and then finally on the right is James Jabar.

The four of them got 10 claims, Jabar got 15. So these are five of your top Aces in the war. But a more formal photograph is this one. Obviously taken in Washington appropriately under the view of Hap Arnold. My pointer doesn't work but the Vice Chief

of Staff Nate Twining, Secretary of the Air Force, Howard Talbottt, Chief of Staff Nate Twining, Blues Blesse who had 10 victories. John Myer who had 24 victories in over the German Air Craft we got two in Korea and in the front row, you can see Gabreski on the left. He had 28 over Germany and six and a half in Korea. And to his right is Iven Kinchelow who had 5 kills. So these are your top Aces.

But the top Ace of the war was Joseph McConnell. McConnell was 31 years of age when he got his 5th kill and had about 1100 flying hours. Ironically, McConnelll had washed out a pilot training during World War II and flew as a navigator in B-24s in World War II. But then after the war he goes on to earn his wings and then goes to Korea. After becoming an Ace, he shot down and fished out of the Yellow Sea by Air Sea Rescue. On his last day in combat, he flies two missions and on those two missions he knocked down three MiG's to run his toll up to 16, become the top Ace of the war. He got 16 MiG's on 106 missions. He was to be killed on a flying accident, test flying an F-86H in August of 1954.

The second rank order was James Jabara on the left. Jabara was 27 and a half when he got his 5th MiG and had about 1800 flying hours. He has flown two tours in World War II. Two tours, 168 combat missions, where he was credited with one and a half German aircraft. He flies two tours in Korea where he runs his total up to 15 on 163 missions. And he was on active duty when he was killed on an automobile accident in November of 1966.

He's shaking hands here with Pete Fernandez. This is actually when Fernandez got his 5th kill. He's congratulating him on that. Fernandez was 28 at this point and about 2100 flying hours.

Fernandez got his wings in World War II, but could not see any combat but then became a gunnery instructor and had the reputation of being one of the best shots in the Air Force. And apparently, had been an instructor to McConnell. Fernandez knocks down 14 and a half MiG’s on a 145 missions. He retires from the Air Force as a Major in 1963 and then is killed in a very controversial flying accident in October of 1980. Here are two of these top Aces being congratulated by the President.

Well I'm not going to go through all of the other Aces although that would be a lot of fun but I do want to mention one other. The one non-Air Force F-86 Ace of the war and this was Marine Major John Bolt. Bolts have knocked down six Japanese air planes in World War II and six MiGs. And this llows me to introduce you to a subject that we haven't talked about and is not in display. And that is a number of exchange pilots who flew F-86s. He was one of at least 51 exchange pilots. I've been able to identify about 51. Of the exchange pilots from the Marines, Navy, RAF, RCAF. And these 51 pilots got credit for knocking down 49 airplanes.

The most famous of these probably though is someone else near and dear to the heart of those of you from the very buck-eyed state and that's Marine Major John Glenn. Glenn got three victories in 10 days in the last days of the war. And probably would have been

Ace had the war gone on. I should also mention that Glenn admit in his memoirs that he got one of his airplanes over China. So I think we've touched the major points, at least the major points as I see them of the story of the F-86, of the fight for air superiority in Aces.

To summarize then, we now know that we are additionally were fighting against Soviet pilots in regular Soviet units. We now know that intrusions into China were frequent and were condoned and even lead by top ranking Air Force officers. Unfortunately, we don't know any more about the claims issue except that it's very frustrating and I guess in my view, is never going to be resolved. It's going to be one of those terrible, terrible mysteries. But this is really not important. I don't think because regardless of the numbers, what's significant is that the F-86 has won air superiority and they won it with these two exceptions that I should make clear to them. So I could get dinged in the Q & A about this. The two exceptions of air superiority are the so-called Bed-check Charlie. These were Communist pilots who flew after the World War II by-plane trainers at night that we were never able to effectively stop which harassed our troops and the other one was in MiG alley. The MiG's were able to drive B-29 out of the day-time skies and forced the B-29 to bomb at night. And those are the two major exceptions. Otherwise, we had air superiority. And this air superiority was won not with superior numbers. It was won not with superior aircraft because the MiG did have its advantage. It was won not in the way it was won in World War II. When in World War II, we bombed out enemy fighter factories; we attacked enemy aircraft on the ground which by the way is the one thing that was not done in Korea. We went into China but we never shot up Communist aircraft on the ground but it was done on air-to-air and it was done of course because of superior pilots. Pilots were more experienced. Pilots were better trained. Pilots were more aggressive than the pilots that they faced.

Air superiority was significant and it allowed American allied, UN missions, to be flown in close superiority, close air support and in interdiction. There were few allied losses to enemy air. In fact, I'm pretty certain that we lost more allied ground troops to friendly fire than we did from Communist aircraft. Where conversely; we caused considerable casualties to the Communist and made his life very difficult with air-to-air. And I think really were a deciding factor on how that war turned out.

So air power was significant in the outcome of the war and I think a proud episode in aviation history. The last thing I like to do before I conclude is to flash up a little bibliography and maybe this is my teaching experience. Leave something for those of you who are interested in a macro view of the war, particularly air superiority, I recommend some of these books. Thank you very much and I look forward to the Q&A.

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