

SETP FOUNDATION ORAL HISTORY PROGRAM

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Captain Eric “Winkle” Brown, CBE DSC AFC British Royal Navy’s most decorated pilot

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Interviewer**

INTRODUCTION

The following is an interview with world renowned British test pilot, Captain Eric “Winkle” Brown, CBE DSC AFC, for the Society of Experimental Test Pilots Foundation’s Oral History Program, made possible through the generous support of the Northrop Grumman Corporation and individual donors, for the Society of Experimental Test Pilots Foundation, Lancaster, California. In this interview Captain Eric “Winkle” Brown discusses his experiences becoming the most decorated pilot of the Royal Navy’s Fleet Air Arm and coming to hold three absolute Guinness World Records for the greatest number of aircraft carrier deck landings (2,407), greatest number of aircraft carrier take offs (2,721) and flying the greatest number of different types of aircraft (487), surviving 11 plane crashes and the sinking of HMS Audacity in 1941, honored by King George VI and Queen Elizabeth II, being present at the liberation of Belsen Concentration Camp, interrogating leading Nazis after the end of World War II, as Commanding Officer Enemy Aircraft Flight, he flight tested 53 types of captured Nazi aircraft including the dangerous rocket fighter, the Me163, serving as the Royal Navy’s Chief Test Pilot and Britain’s Deputy Director, Naval Air Warfare, his experiences as a test pilot at the U.S. Naval Flight Test Center at Patuxent River, Maryland, as Director of the British Helicopter Advisory Board, he envisioned and promoted the use of British helicopter air ambulance and police helicopter services throughout Great Britain and serving as President of the Royal Aeronautical Society.



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BIOGRAPHY

World renowned British Royal Navy test pilot, Captain Eric Melrose “Winkle” Brown, is best known as the Royal Navy’s most decorated pilot, holding world records for flying 487 different types of aircraft, a world record that is unlikely ever to be matched and piloting 2,407 aircraft carrier landings, another world record.

Born in Leith Scotland, on January 21, 1919, Captain Brown was educated at Edinburgh’s Royal High School before studying at the University of Edinburgh, where he learned to fly. During World War Two, Captain Brown flew fighter aircraft, survived the sinking of HMS Audacity in 1941, witnessed the liberation of Bergen Belsen concentration camp and interrogated some of the leading Nazis after the war, including Heinrich Himmler, Hermann Goering and Belsen’s chief guards Josef Kramer and Irma Grese and flew 53 captured Nazi planes including the Me 163 (Komet) rocket plane and Me 262 jet.

In 1948, Captain Brown made the first jet landing on an aircraft carrier. In 1951, he was attached to the U.S. Naval Air Test Centre at Patuxent River, Maryland. Honored by both King George VI and Queen Elizabeth II, Captain Brown has been awarded Member of the British Empire (MBE), Officer of the British Empire (OBE) and Commander of the British Empire (CBE), awarded the Air Force Cross (AFC) and the Distinguished Service Cross (DSC). During his world record breaking aviation career, Captain Brown survived 11 plane crashes and met with King George VI and Sir Winston Churchill numerous times and served as an Aide de Camp to Queen Elizabeth II

Captain Brown wrote numerous aviation books and forewords for other aviation history authors. His Autobiography “Wings on My Sleeve” was a best seller and he also wrote a popular series of articles titled “Viewed From the Cockpit.” Captain Brown retired from the Royal Navy in 1970, becoming the Director General of the British Helicopter Advisory Board and serving as the President of the Royal Aeronautical Society from 1982 to 1983. An Honorary Fellow of SETP, Captain Brown was also awarded “Master Pilot of Russia” and inducted into the U.S. Navy’s Carrier Test Pilot Hall of Honor.

Captain Brown was honored by the Royal Navy in March 2015, with an unveiling of a bronze bust dedicated to him, at the Fleet Air Arm Museum in Somerset, England. In 2015, Captain Brown also attended the 70th anniversary of the liberation of the Belsen Concentration Camp with Queen Elizabeth II.

Sadly, Captain Brown passed away at age 97 on February 21, 2016. On July 21st, 2016, Great Britain and the Royal Navy honored him with a Commemorative Tribute and Flypast of 40 different aircraft, many of which he had flown, at the Royal Naval Air Station Yeovilton in Sommerset, which is the home of the Royal Navy Fleet Air Arm. His Royal Highness, The Duke of York KG (Prince Andrew), a long time close friend of Eric’s, attended the Tribute, along with over 600 guests. It was a wonderful and fitting tribute to Great Britain’s most celebrated and decorated pilot.

INTERVIEW

Kilanowski: This is Dana Marcotte Kilanowski for the Society of Experimental Test Pilots Oral History Program. I am interviewing Captain Eric “Winkle” Melrose Brown at the SETP 2007 Symposium at the Grand Californian Hotel at Disneyland. This interview takes place on Thursday, September 27th, 2007. The cameraman is Dennis Archuleta, courtesy of the Northrop Grumman Corporation. SETP would like to thank the Northrop Grumman Corporation for their generous on-going support of SETP’s Oral History Program. Good evening and thank you, Captain Brown.

Brown: Good evening.

Kilanowski: Can you please give me your full given name, the date, and place of your birth?

Brown: My name is Eric Melrose Brown, and I was born in Leith, Edinburgh, Scotland, on the 21st of January, 1919.

Kilanowski: What drove your decision to become a pilot? Was it a dream you had as a young boy or did it just evolve?

Brown: No, it was really generated by the fact that my father had been in the Royal Flying Corps, and in the lounge of our house there was a large photograph or probably a painting, actually, of him in his RAF—or RFC as it was then—uniform, and I always eyed this and thought, “Hmm. I wouldn’t mind getting into that outfit.” So that’s really what stirred it up.

Kilanowski: How did you come by the nickname “Winkle”?

Brown: In the Royal Navy, or in the Fleet Air Arm in particular, we’ve always this name for somebody, and it’s usually associated with somebody of my stature. I mean, I’m only about five-feet-seven. The one before me was a very famous pilot who won our Victoria Cross, which is our highest award, and the day after he was killed, winning that award, his nickname moved on to me. There was no formality about it. It was just like somebody beating the tom-toms, and they all started calling me “Winkle.”

Kilanowski: How did you come to be in Germany when the war was declared?

Brown: In 1937 and 1938, I was at Edinburgh University studying modern languages, and I was doing an Honors course, and because of this, the Foreign Office approached me and asked me if I would be interested in joining the Diplomatic Corps. I showed an interest, and they said that would mean for my penultimate year of my four-year course, I’d have to go abroad and teach, to learn the languages of the country I was in. So I was packed off to Germany and was sitting there fat, dumb, and happy when the war broke out.

Kilanowski: How were you notified that the war had broken out?

Brown: At six o'clock on the morning of third September, which was a Sunday, I was in a small hotel in Munich, just enjoying the weekend there, and there was a knock on my door about six in the morning, and there was a lady interpreter with two SS officers, and they came in and said that our countries were at war and that I'd be under arrest. Well, that wasn't strictly true. Technically, we weren't at war till eleven o'clock, I think it was, but that's a moot point. [laughs] And so I was removed and kept in an SS jail for the next three days.

Kilanowski: What happened after that?

Brown: I didn't realize it at the time, but I subsequently found out that I was only one of sixty British students from various universities chosen by the Foreign Office to do the same as I was doing, and there were sixty Germans doing a similar exchange in the United Kingdom. Now, if I'd known that, I'd have been much happier, but it eventually came out and we were exchanged through the Red Cross in Switzerland.

Kilanowski: How did you make your way back to the U.K.?

Brown: When I eventually got to Switzerland, I went to the British Embassy in Bern and was interviewed by the ambassador, and he then told me that since I was in the University Air Squadron, I had better get myself back to the United Kingdom because I'd be automatically called up for service, and he gave me the petrol coupons to drive my car back, because, strangely enough, although the Germans took everything from me, including my car, they gave my car back to me. And you may ask why, but with typical Teutonic logic, I asked them why, and they said, "Because we have no spares." So there we are. It was rather an old MG. [laughter]

Kilanowski: My goodness. Well, you were probably very happy to make it back to merry old England.

Brown: Very.

Kilanowski: What drove your decision to become a member of the Fleet Air Arm of the Royal Navy?

Brown: When I got to my RAF station, things were extremely quiet. It was the period of what they call the "phony war" in the beginning. And being young and suicidal, I thought we should all be rushing into action, and nothing was happening.

And in September of 1939, the Royal Navy had an aircraft carrier, *HMS Courageous*, sunk off the south of Ireland, and we lost a lot of the crew, including the pilots, and so there was a shortage of pilots in the Fleet Air Arm, and they were allowed to advertise this by the Minister of Defense in RAF stations. And I saw this on the notice board and thought, "Well, that's for me. I'll get into action quicker this way." So that's how it all came about.

Kilanowski: Can you describe your first flight assignment on Britain's first escort carrier?

Brown: This little carrier was called *HMS Audacity*. It was very small, and the flight deck was only 425 feet long. Now, the average carrier in those days was about 800 feet long. And it had no hangar. All the aircraft—when I say “all,” there were only six fighters parked on the upper deck. And the task of this carrier was to protect British convoys going to Gibraltar, and therefore we were operating mainly in the Bay of Biscay area, which was a fairly stormy area and was well populated, if that's the right word, by U-boats, so it was quite an active area.

Kilanowski: Very dangerous area to be in.

Brown: It was indeed, and we, in fact, had the worst attack ever made on a convoy throughout the whole war during this period. So I think you're right in saying it was a pretty prickly area.

Kilanowski: Can you describe your first takeoff from a carrier?

Brown: I had never seen an aircraft carrier before until I was told I was going on to this one, and I flew out. My flight leader had been on a big aircraft carrier, and he was quite shell shocked to see the size of this thing, but, to me, it didn't mean much because I hadn't seen a carrier before. So maybe I started off with that advantage. I didn't expect too much and didn't get too much. [laughs] And it was very exciting. It was a very new experience and a very challenging one too. I thoroughly enjoyed the experience.

Kilanowski: I'm assuming there was no catapult on the *Audacity*.

Brown: There were no catapults, no. It was all free takeoff.

Kilanowski: What plane were you flying?

Brown: The American Grumman “Hellcat”—sorry, “Wildcat,” under Lease-Lend. These Wildcats had originally been due to go to France, and when we got them, when France fell at the beginning of the war, they were diverted to Britain, so we finished up with French Wildcats with all the instruments in kilometers instead of miles-an-hour, and various designations which were entirely French. But these were replaced after about six months with British ones—well, really American ones, but with the same designations as we used in Britain.

Kilanowski: Did you try to land on the *Audacity*?

Brown: Yes. For the first initial introduction, we all had to do four landings, and some found it easy, some did not, so it varied.

Kilanowski: What was your experience with your first carrier landing?

Brown: I found it remarkably easy, frankly, and all went well. I just took to deck landing. I think I liked it.

Kilanowski: Certainly a challenge! How did you become the most decorated pilot in the Fleet Air Arm during the war?

Brown: Being in the right place at the right time. Partially operational awards, but mainly I would say test flying awards.

Kilanowski: What was your most memorable flight while you were flying with the Fleet Air Arm?

Brown: I think my first experience in World War II of going into combat against a German aircraft, and that was something that it is difficult to replace in the mind.

Kilanowski: Can you describe it?

Brown: We were being opposed by large four-engine aircraft called Focke-Wulf Couriers, which was a military version of what had been a civil airplane, the Condor. But it was the most heavily armed aircraft of that era, so it was a formidable foe and difficult to shoot down. We'd already lost some of our pilots to these, and I had made a study of its armament and how I reckoned it could get the best chance of killing us, and, of course, alternatively, our best chance of killing it, and I decided that the best way of dealing with it was a head-on attack, which would bring fewer guns to bear than any other attack, and that worked out very successfully.

Kilanowski: How were you selected to become a test pilot in 1942?

Brown: This was all, again, because of the *Audacity*. When we were sunk in December 1941, the captain of the carrier, who was killed in that occasion, had already sent in to the admiralty reports on all the officers. In my report, he had said I had a facility for deck landing and it should be used, and that's how I got into test flying.

Kilanowski: I'd like to digress a bit and ask you about your experiences when your ship was sunk. You spent quite a few harrowing hours in the water.

Brown: When we were sunk, there were attendant destroyers in the vicinity, and they came, picked up as many people as they could. And I thought we were going to be picked up just in a few minutes or so, when suddenly all these destroyers left. Now, what we didn't know at the time was the reason they had left was they got indication that the U-boats were still in the area, and they thought this is not the time to hang around and be sunk with a load of survivors aboard. So they had to abandon some of us, and I was left with twenty-four altogether. Only two of us survived. We were in the water, I would say for about four hours, and one has to remember this was the 21st of December. Water was a little chilly.

Kilanowski: What do you attribute your survival?

Brown: I was young, fit, and I had a pilot Mae West (life jacket) on, which the seamen, of which there were twenty-four with us, they didn't have Mae Wests. They had a rather simplified form of lifebelt, which really was just an inner tube of a tire with tapes from the tube over their shoulders, and the problem with that was if you got tired and fell asleep, you would drown. You'd fall forward and drown, whereas with the Mae West, your head was supported and you could fall asleep and still float and survive.

Kilanowski: Can you describe your experiences and duties at the Aeroplane and Armament Experimental Establishment at Bascombe Down?

Brown: I was at Bascombe Down for quite a short period, and the job there was normally to pass aircraft through to the operational pilots after they had been cleared by Bascombe as being fit for service. But the main thing, the main advantage that accrued to me out at Bascombe Down was they handed me a lot of experience on—you see, I was basically a single-engine pilot, but they gave me a lot of experience on twin- and four-engine aircraft, which helped, stood me in very good stead in the future.

Kilanowski: Can you describe your experiences as chief test pilot at the Royal Aircraft Establishment at Farnborough?

Brown: Now, Farnborough is the main research, flying research establishment in Britain. You could only call it the equivalent, our equivalent of Edwards Air Force Base. And we got the job of doing any research that was, if you like, a little out of the ordinary on new aircraft, and we were also, I would say, troubleshooters. If one of our aircraft firms had manufactured or built a new prototype aircraft and it had some difficulty with it, it would call on Farnborough for help. And we were independent, we were not associated with any company, and we'd be sent to that company or they'd send the aircraft to us, and we would try and find the problem and cure it for them. So that was quite a demanding job.

But our main duty during the war years was to improve the performance of our fighters, so the main part of our testing was in the transonic region, getting near the speed of sound or as near the speed of sound as we could get in those days. And in addition, of course, I did all the naval test flying. That was additional part of the work.

Kilanowski: That was a heavy workload at that time.

Brown: Very.

Kilanowski: Can you describe your experiences as Commander of the Enemy Aircraft Flight?

Brown: Because I was German-speaking, I had been chosen for this job, also the fact that I was in the High Speed Flight, because what we were looking for, we believed that

the Germans had made some very interesting advances in aviation technology, and we wanted to get into Germany as soon as the war finished, even before the war finished, to try and capture as many jet and rocket aircraft as we could and as many high-grade scientists as we could before they destroyed the aircraft or the scientists were picked up by the Americans or the Russians. [laughs]

Kilanowski: I'll ask you that question now. I was surprised when the Americans took so many of the Peenemünde scientists, including Wernher von Braun. Did the British also take quite a few German scientists, or did the Americans and Russians take them all?

Brown: No, by no means. I would say initially they were pretty evenly divided. From being allies, we three of us suddenly became competitors: ourselves, the Americans, and the Russians. And we'd captured a load of aircraft and a load of scientists, but then we began to weed them out a bit, and we kept the ones we believed were best, the Americans did likewise, and the Russians too. And then there were some left over, and they became, if you like, into the pool, and people could lure them away, to hire them, to give them money to work there. And, of course, the Americans had a big advantage in this area because they had the money, and neither Britain nor Russia were very financially well off at the end of the war. So the Americans finished up with by far the greater number.

Kilanowski: Did you have the equivalent of our Paperclip Program?

Brown: I'm not clear what the Paperclip Program was.

Kilanowski: The Paperclip Program was headed by Dr. Wernher von Braun, and it was a cadre of highly trained former Peenemünde scientists that worked on our rocket program in Huntsville, Alabama.

Brown: No, we had no equivalent like that. I don't think we had the financial resources, frankly, to engage in a program like that, and there was no competition for Von Braun because, for one thing, he was captured by the Americans; therefore he was their prize. Very kindly, they give us interrogation rights with him, so he came to Britain and I interrogated him, but he was American property.

Kilanowski: I'd like to ask you what you learned from Dr. von Braun.

Brown: Well, of course, he was a brilliant scientist. I have never met a man with more self-confidence in all my life. His attitude literally was such that although at this time he didn't speak a lot of English, when he was captured by the Americans he had a very bad broken arm as a result of a car accident, but he was full of the joys of spring and more or less said to the Americans, "Aren't you lucky guys to catch me?" That's the sort of man he was. Of course, what he had shown in the war, was his tremendous capability in the space field. Quite apart from it being a war job, this was the man's hobby. He loved everything he was doing, and the fact that he was working for the Army at that time gave him unlimited resources. So he knew what he was doing, and I would say the Americans were extremely lucky to have him.

Kilanowski: Were you surprised at the level of technology the Germans had developed?

Brown: Indeed I was. Indeed I was. I would say having reviewed everything we saw after, let's say, nine months, I would think they were, my judgment, a year ahead of the British and Americans and Russians in their advanced aviation technology.

Kilanowski: You also interviewed Dr. Heinkel.

Brown: Yes.

Kilanowski: What were your impressions of Dr. Heinkel?

Brown: Dr. Heinkel was a nice little man. He was not political. He did not like the Nazis, but he couldn't show that, of course, because he was a Jew. And when I interrogated him, I said, "It mustn't have been easy for you." He said, "I was living on a knife's edge all the time. If I didn't produce the goods, I'd be off to a concentration camp." So he had, I would think, a very, very difficult life during the war. But he was, as an aerodynamicist and, indeed, production man, very, very good in his field.

Kilanowski: And what about Willy Messerschmitt?

Brown: Quite different. He was a Nazi sympathizer, very good production manufacturer, but he also was a little suspect in the sense that he would be prepared to give up structural strength on an aircraft to reduce weight and thereby gain performance, and this caused quite a lot of accidents with these Me-109, wings coming off, that type of thing. So I didn't particularly care for him.

Kilanowski: And Kurt Tank?

Brown: The most brilliant of the lot. He was brilliant because he had the incredible ability to have been both a pilot and the chief designer. He was the assistant test pilot and the chief designer. With a combination like this, he had this gift of really having insight into what a pilot wanted, and, as a result, his Focke-Wulf fighters were Germany's best in the piston-engine field.

Kilanowski: And Hanna Reitsch?

Brown: A dreadful woman, fanatical Nazi. Before the war, unquestionably the finest glider pilot in the world. She had no formal training as a test pilot. She decided she would call herself a test pilot, and she made a nuisance of herself at Rechlin, which was their equivalent of Edwards Air Force Base, by turning up and demanding to fly aircraft when she wasn't really fit to fly. But she would threaten them with calling her friend Ernst (Udet?), the general who was in charge of the Technical Division of the Air Ministry, if they didn't give in to her.

But I must explain. When I say she wasn't competent, I don't mean she wasn't a good flier. She was in her field a brilliant flier, but she didn't have the strength to deal with some forms of flight. For example, transonic testing, you have to pull at times 100 pounds to keep yourself alive, and in big four-engine aircraft you have to pull heavy loads, and she was just not capable of these. I'm not denigrating her for courage, which was unbounded. The lady was not short of courage, but she was pretending to be something she wasn't.

Kilanowski: And also the Horten brothers.

Brown: The Horten brothers, to me, were a phenomenon because I do not know how in the middle of a war they managed to bamboozle their way along and conduct their experiments on quite extraordinary aerodynamic shapes, and very successful ones, and in the end, might have produced a wonderful result for Germany. But this was all being done really—they were both Air Force officers. They should have been in the front line flying instead of messing around in their own private field, virtually. But in their way, too—well, certainly there's the younger brother—no, the older brother, he was the brilliant one.

Kilanowski: What was the most significant outcome of your testing of fifty-three different German aircraft? Which of those planes really stands out in your memory as being special, and why?

Brown: The great airplane they had and, in my opinion, the most formidable aircraft of World War II was the Messerschmitt 262, but, of course, they had three different kinds of jets flying operationally—well, one was almost operational, but we were able to fly it quite extensively. And they had a rocket aircraft. Now, the rocket aircraft was a brilliant innovation, but operationally a tool of desperation and it wasn't working well. I mean, it didn't have a brilliant combat record, but technically quite astonishing. We—when I say “we,” the Allies—did not really know how they were moving so fast during the war, because no information was coming out of Germany. Their control of security was quite astonishing, which you can get away with, of course, in the kind of state the Nazis ran. But, for example, when we in Britain flew our first jet in 1941, we thought it was the first jet aircraft in the world. Far from it. The Germans had actually flown one in 1939 before the war began, but we were not aware of this, so we were in for some rude shocks at the end of the war.

Kilanowski: Can you tell me your impressions of flight-testing the Me 163 (Komet)?

Brown: The 163, the rocket aircraft?

Kilanowski: Yes.

Brown: If I had to put it in a few words, it was like being in charge of a runaway train. I felt this because I only had one flight in it under par. I think after maybe three flights, I'd

have felt I had a grip on it, but at first I had the feeling it was a jump ahead of me all the time. You had to move pretty fast. This thing really moved around.

For example, I'll give you an example, the climbing speed of a normal fighter that stage in the war, just before the end of the war, was about climbing speed of maybe 200 miles an hour and a rate of climb of about 3,000 feet a minute. The Messerschmitt 163 had a climbing speed of 450 miles an hour and a rate of climb of 16,000 feet a minute, in a totally different league. So it was, as I say, like being in charge of a runaway train.

Kilanowski: I understand that the 163 used highly hazardous fuel. It was a very high-risk plane to fly, wasn't it, because of the fuels?

Brown: Indeed. Indeed. There were two very volatile fuels, and they were highly dangerous to transport or even to refuel the aircraft, and they were so explosive that you could not afford to land this aircraft with any fuel in it at all. You had to jettison the fuel if, indeed, you had any left, which was unlikely, but you just could not even make a bumpy landing with any fuel aboard, otherwise the whole thing would explode, taking, of course, aircraft and pilot with it.

And one of the uncomfortable things was the pilot sat in what was almost equivalent to an armchair, and the armrests were, in fact, two tanks of concentrated hydrogen peroxide, violently explosive. And I said to the rocket motor inventor, "What would happen in combat if a bullet penetrated these." And he said, "They would leak. They wouldn't explode, but they would leak, and it would actually melt the pilot within about ten minutes." That's the sort of fuel you were dealing with.

Kilanowski: My goodness. What were your opinions of the level of German aviation technology and flying expertise versus British aviation technology and flying expertise?

Brown: As I said, I think the technology was well ahead of us, about maybe a year ahead of us. This was, to a large degree, because they had made the preparations before the war by setting up a lot of technical colleges and university aviation departments. So they were well prepared, and this was the secret of their success in technology.

As regards to pilot expertise, I would say ourselves, the Americans, and the Germans were on an equivalent basis. There was nothing in it. It was just we were more or less of the same quality.

Kilanowski: Can you describe your experiences as Commander of High Speed Flight Test?

Brown: During my time in High Speed Flight, our Holy Grail was, of course, supersonic flight. We wanted to be like every nation, I suppose, at that time, aviation nation, be the first to break the sound barrier, and we were well on our way, we believed, and I was to be the pilot for the airplane called the M.52, which we believed would break the sound barrier. It was cancelled by the government in 1946 for a reason that is obscure to this day, and all the expertise was handed over to America. We still don't know why this

occurred the way it did or why the cancellation was made, but, of course, we lost our chance there. However, we battled on and we were not far behind the Americans. Of course, we were fifteen months ahead of the Americans in transonic flight testing when this cancellation was made. We believed we would be able to break the sound barrier in December 1946—no, even a little earlier than that, maybe around September 1946, but this unknown cancellation by a Labour government denied us this.

Kilanowski: My goodness. That's really a shame.

Brown: To such a degree that Mrs. Thatcher, when she came to power, Conservative government, issued a white paper. Now, this is a thing in Britain where a prime minister only does this, issues a white paper, if he feels there is some extraordinary event that must be explained to the public, and she said in that paper that this was one of the most critical mistakes that had ever been made in Britain affecting our aviation standing in the world.

Kilanowski: And the white paper did not disclose the reasons?

Brown: It did not.

Kilanowski: My goodness. Let's see if I have more questions here. I want to go into transonic flight, but I think I have a couple more questions I'd like to ask you before we talk about transonic flight. I wanted to ask you how you came to be the first naval pilot to command aerodynamics flight.

Brown: Normally, a tour of duty at an establishment like Farnborough was two to three years. Most people did about two. I had already done three years when the top test pilot as regards length of duty there finished, so I came to the top of the heap, and the Navy said, "You can keep him for another three years," and that's really how I came to become head of the aerodynamics department.

Kilanowski: That's a very, very prestigious position and one that I'm sure you were thrilled to assume.

Brown: Oh, yes, I was very conscious of it, yes.

Kilanowski: I wanted to ask you about the development of the jet airplane in Britain. When I was doing research years ago, it seems that Sir Frank Whittle had the idea of the jet engine years before the British government embraced funding the project.

Brown: Yes.

Kilanowski: Why was that?

Brown: When Frank Whittle really made his brilliant, like all brilliant things, rather simple modification that turned jet propulsion purely as a principle into an actual working

unit, he was nineteen years of age, a cadet at RAF College. And the scientists who heard about it just could not believe that a young man of this age and inexperience could have such a brilliant idea which he expounded. I mean, he just didn't say, "You know, I kind of know how to do it." He laid it out and actually took out a patent on this.

And then I think this became exacerbated by a little professional jealousy outside. When they realized it was workable, there were many scientists, I think, that had rather had their nose put out by this young man, and human nature being what it is, I think they just did not give him the backing that they could have done because they thought they could have taken their own way of doing it. And it was a very, very sorry situation, because after his patent had run five years, from 1930 to 1935, it had to be renewed. The cost of renewal was five pounds, ten dollars, and he didn't have the money as a young impecunious cadet to renew it, so it lapsed and anybody could have access to it. And the German Embassy in London, of course, bought dozens of copies of it and distributed them all over the aviation industry in Germany. So this was a dreadful occurrence, really.

Kilanowski: Can you describe your first flight in a jet aircraft and which plane was it?

Brown: I first flew a jet—this was our very first jet aircraft, which was with Frank Whittle's engine and many of his ideas in the aircraft also, and, of course, it was a great thrill and great experience and unforgettable because one just gloried in all the things that were so different from a piston-engine aircraft. The view was so wonderful. You didn't have a long nose and an engine in front of you. There was no vibration, which you had all the time in a piston engine, and there was no noise as far as the pilot was concerned. I know externally there was quite a lot of noise from a jet engine, but if you're sitting up in front there, there's virtually no noise. And the whole thing. And the turn of speed, I mean this thing only had a very small engine in it and yet it was as fast as any Allied fighter at the time. So it was a new world, it really was.

Kilanowski: I also wanted to ask you how you were selected for the world's first landing of a jet aircraft, the de Havilland Sea Vampire on the *HMS Ocean*. That must have been quite an experience.

Brown: Yes, very much so. But there were two factors involved. One was at that time I was the most experienced deck-landing pilot in the world, and also I was the only naval officer in the world that had flown a jet aircraft. So the two things almost made it an eventuality.

Kilanowski: I want to go now into questions about transonic flight. What was British involvement in transonic flight testing during World War II?

Brown: We started earlier than any other nation in the world, and our first transonic flight testing was started on the Spitfire. This is, of course, we had the machine, you see, which could lend itself to this, and it started in November 1941 at Farnborough. And the earliest I can find in Germany is the Messerschmitt-109G in 1943. The Americans and Russians had not done any transonic testing at all, so we were preeminent at that stage in

history. So in high-speed flight, we were a very privileged group, really, to get this early experience.

Kilanowski: What were the problems and surprises that you discovered as you reached the transonic flight envelope?

Brown: We had not realized that once you start fighting at high altitude, you are in a different combat world. Different forces are working on you and you have different limitations and different problems to deal with, and one of the main problems is once you get up into the transonic region, you get vast changes of trim which affect the way the airplane behaves. And if it is allowed to go on beyond that stage, you are virtually certain to be heading for total loss of control, and it may not be fatal, because if you can hang on and as you get in the lower altitudes and, therefore, the denser air, the Mach number will automatically drop, but there are very large trim changes, a huge amount of vibration occurs, so you have quite a lot of work on your hands if you're doing transonic testing, large forces involved.

Kilanowski: Did you lose a lot of fighter pilots during World War II to these newly discovered problems in the transonic area?

Brown: Initially we lost a lot of test pilots, and then not so much in the Spitfire. The problem really reared its ugly head when the P-51 came to Britain in 1943. And General Jimmy Doolittle came to Farnborough at the end of 1943, beginning of 1944—I think actually it was January 1944—and explained that his Flying Fortress formations, very large formations, were being attacked by German fighters, and they lost a lot of bombers, so he started taking escort fighters with him. Now, at first, these escort fighters did not have good high-speed characteristics, and the rear gunners in the Flying Fortresses were reporting that they would see the German fighters coming up to attack, and their escort fighters would dive down to intercept the Germans, and instead of intercepting them, would go straight past, dive down, make a big hole in the ground, and this was these large effects of transonic flight taking that toll on them.

So Jimmy Doolittle was a long way from home at this time, and he asked Farnborough to do a series of tests on these fighters for him, which we did, and I think we gave him all the information he needed, because when I came to the SETP in 1984 to be made an honorary fellow, I had the honor to sit next to Jimmy Doolittle, and he said to me, "I'll always be eternally grateful for the help you gave me in extremis," he put it, "in the war." So that is a nice memory. And they finished up with the finest escort fighter in the world, of course, the P-51 Mustang.

Kilanowski: What sort of a man was General Jimmy Doolittle to work with?

Brown: A man of action, didn't beat about the bush, didn't want to be bothered with paperwork, wanted to get on with it, and a man after my own heart. I liked him.

Kilanowski: What was the de Havilland company's involvement in transonic flight testing, and how did you become involved in it?

Brown: de Havilland was one of our better fighter manufacturers, and they made such famous airplanes as the Mosquito, and therefore they were involved in the high-speed flyings from the beginning. They could only do it, of course, on their own company products, so they depended on Farnborough a lot to get them added information from their own flying. But they liked to conduct their own and get the experience because they needed this background in design work, and we gave them all the help we could.

I would say de Havilland and Supermarine, who made the Spitfire, were our two—well, no, there was another one, Hawker, who made the Hurricane. These three companies were our great fighter conglomerate. It's rather like North American, Northrop, Grumman, etc. So they were conducting their own thing within their own resources.

Kilanowski: Were you present during Geoffery de Havilland's tragic accident in the 108 Swallow on September 27th, 1946?

Brown: I was at Farnborough at the time and was very well aware of it because I had a lot to do with Geoffery de Havilland, Jr., and he had invited me because I'd been head of the high-speed flight tour, taken interest from the very beginning in the de Havilland 108. As you know, we started out believing—well, the company, that is to say, believed that it had the potential to beat the world speed record and also to go supersonic. Neither of these evolved, as it happened. So one has to say that it was a sad airplane in the sense that three were built, three had fatal accidents. And I was very involved with it, and it was a lot of knife-edge flying with that airplane, to say the least.

Kilanowski: When the accident report was completed, what was the determination for the cause of Geoffery de Havilland's accident?

Brown: He had been doing a fairly low level—we're talking about 7,000 feet—low-altitude flight, preparing to make an attempt on the world speed record, and it was made in slightly bumpy air, and this, we believe, set off an oscillation in the aircraft which eventually got out of hand and caused the airplane to break up, and it literally disintegrated at a Mach number of .875 at 7,000 feet. And Geoffery was found after the accident on the mudflats of the Thames, and he was wearing his parachute, which had never been opened, and we believed at first the parachute had failed to open when he pulled the ring and he had impacted with the ground, and this had broken his neck. But when the medics looked at it and we looked at the parachute, there was nothing wrong with the parachute at all, and Geoffery's neck had been broken in flight. So what we found was that the transonic effect had been so violent that it had caused the aircraft to oscillate, and Geoffery was six-foot-two and, being tall, as his neck moved forward, back and forward with the oscillation, we believed—we were guessing at this time. We confirmed it later, but we believed that his head had struck the cockpit canopy and broken his neck, which in the event we believe was the actual thing that happened.

Kilanowski: Did this accident cause the end of the transonic flight program in England, or in Britain, or did the flight test program continue with you flying?

Brown: It continued with a slight hiatus while we determined to find out the real cause of this, and I was involved in doing the accident investigation flying. So we didn't stop. In general, we stopped, but at Farnborough we kept on with just this one specific thing, to find out the reason for this extraordinary accident. And once we had got that, we carried on then.

Kilanowski: When did the British flight test community call a halt to trying to break the sound barrier?

Brown: I would say once—well, I'm just trying to think about this. We had fighters that could break the sound barrier, and so we were keeping up with the hunt in the manufacturing trade. In the research trade, we kept at it, I would say, right up until the mid 1950s, and then it gradually petered out for simple reason, I would say, financial reasons, coupled with the fact that it was obvious that American technology had moved into the lead.

Kilanowski: Was there free interchange of transonic and hypersonic flight data between the United States and Britain during this time?

Brown: Not at all. Not at all. This is the whole problem, and this is one of the things that caused a hiatus in relationships, I think, that when our supersonic project was cancelled and we were ordered by our government to hand over all the data to America, the Americans said there would be a fair exchange and we would get their data from them. We got absolutely nothing, and there was no explanation given. But subsequently, we've been told by one or two elder statesmen of that time that the reason was they didn't have anything to give us, that, as I said earlier, America lagged behind in transonic testing. Once it got the bit between its teeth, of course, it raced away. With your incredible industrial potential, there was no catching you once you moved on, but you were slow in moving on to it, and I think during this period there was no exchange, for the reasons I've given you.

Kilanowski: After the war, was there any interchange with American test pilots from Pax River or the Flight Test Division at Wright Field, such as Chuck Yeager and Bob Hoover and Pete Everest? Did they come over and fly your airplanes and you come over and fly ours?

Brown: They did very little. There was more movement from the Navy than there was from the Air Force at this time. When I was CO of Aeroflight at Farnborough we had—your very fine test pilot, the Marine, Marion Carl come over and he spent a couple of months with me, and because of this, he was all responsible for me simply going back to Patuxent River eventually for two years during the Korean War years. So I would say there was quite fluent connection with the Navy and slow connection with the Air Force.

Kilanowski: I believe at the very beginning of our Air Force Test Pilot School, which formed at Old Wright Field, I believe that Colonel Albert Boyd sent some of his pilots back to England to study the Empire Test Pilot School. Were you aware of any of that going on?

Brown: Yes, I was indeed. Yes, I was. I didn't go through ETPS because I was before that, but I had some consultative work to do with the board they set up at ETPS, and we were aware of Colonel Boyd, who was, of course, very much respected and a very good friend to Britain, really.

Kilanowski: When I look at the history, the United States Air Force gained so much knowledge from the British. We founded our Test Pilot School according to your model. You helped us with transonic flight. We owe you so much.

Brown: Yes, I think that's fair to say, and we've always had a tremendous rapport with America and, I like to say, America with us. And it has been very strong in both the flying Navy and the seafaring Navy, and it's taken longer because it's an older service, older in formation, I mean, for the Air Force or the Army to build up. But it was very strong in the 1950s.

Kilanowski: I wanted to ask you how you came to flight test at the Naval Air Test Center at Patuxent River in 1951. How did that all occur?

Brown: I think there were two reasons for this. One was that the Korean War was upon us. America, or the Navy, I should say, really hadn't gotten its Test Pilot School going, and they were having quite a few casualties at Pax River. And Marion Carl had already spent some time with me and we got on very well together, and I think he was quite impressed with the work we were doing. He would never say so—well, I never asked him—but I feel his hand was in that. I had a wonderful time with him, and I really regard it as one of the nicest periods in my life. We were friends right until his tragic death, of course.

Kilanowski: Can you describe your involvement in the developmental testing of the F9F, the Panther?

Brown: I was involved. I had three projects which Marion gave me at the beginning, F9F, the F3H, and the F3D, and all of them were good, sound airplanes, not outstanding airplanes, but good, sound airplanes, and I enjoyed flying them. I found it, frankly, very easy after Farnborough, but he gave me the chance to fly some of the difficult ones too. But maybe he was conscious or maybe he didn't want me to get killed in America, because although he let me fly them, he didn't make me the project officer on them. Now, such airplanes I'm talking about are like the Delta Catalyst. That was a difficult airplane. And he let me fly both the Mark 1 and the Mark 2, but I wasn't the project officer on them. But I had very, very enjoyable time, learned a lot, and, I hope, contributed a bit.

Kilanowski: Oh, I'm sure it was very, very helpful. I wanted to ask you how you introduced the concepts of the angled deck operations and the steam catapult. You were years ahead of us on that with carrier operations.

Brown: When we got this simple but brilliant idea, shortly after the meeting at which this all came out, I was due to go to Patuxent. So the powers that be said, "Well, the ideal way is for you to take the concept over with you and hand it over to the Commander of Flight Test at Patuxent River," which is what I did. And they were delighted, of course. Then later on, the concept of the steam catapult came up, and we decided the best way to introduce it to America would be to send over one of our aircraft carriers, and I did the flying, the introduction flying, from the shipyard up at Pennsylvania, and it worked very well indeed. Both things were very well received, and I couldn't have been happier to give away two things that were going to preserve naval aviation for years to come.

It was interesting, during this steam catapult I was to fly the F9F, the American aircraft, to demonstrate this to them, and when we were tied up in the shipyard, the commander of the carrier said, "Oh, we'll fly the aircraft off of here, just alongside of the ship." And they said, "Oh, no, this aircraft has quite a high stalling speed, and it'll need a lot more wind than this." And he said, "Oh, no, no, no, no, you don't need wind. All the power is in the catapult." And the American authority said, "Well, we're not so sure. We don't think we should do it with these conditions." He said, "Well, if you prepare to let the aircraft go, we'll let the pilot go." [laughs]

I was not consulted, I may say, but like a lamb to the slaughter house, but it went off like a rocket, and a very impressive demonstration because the wind was down the catapult the wrong way, tailwind as opposed to a headwind, and we were alongside, as I say. And it went off like a rocket, so it was a very impressive demonstration, quite a lot of fun. I enjoyed it. [laughs]

Kilanowski: I'm sure that there were a lot of really large eyes when you came back. [laughter]

Brown: Well, a bit of astonishment, yes.

Kilanowski: How did you come to be assigned as head of the British naval air mission to Germany, and what was that mission?

Brown: After a gap after the war, of course, when no military activity could take place in Germany, eventually NATO decided that if the German naval air arm could be resuscitated and trained up to standard and handed over to NATO [unclear] objective for them. So we were given the assignment in Britain to help them out, and since I was German-speaking and had an extensive experience of the aircraft they were going to fly, which were all British—not all, but almost all British aircraft, there were American and French aircraft as well, so I was given this assignment, and it was very interesting indeed because it was a strange mix. You had the old hands from leftovers from World War II, and you had the young up-and-coming youngsters, and it was oil and water, really. And I

realized that the older ones were only dragging the younger ones back slightly, because they were living in the wartime era in their minds, and they were a bit slower to react. But we jollied them along, and at the end of the day, they made a rather good fighting force. My job finished when I eventually officially had them assigned to NATO. So I enjoyed the job. It was a great challenge, not much of a challenge for me in flying, but to see them react well to their training was very rewarding.

Kilanowski: I'm sure. I'm sure you were. How did you come to be a test pilot for Focke-Wulf? Were you still active duty when that happened?

Brown: Oh, yes, I was, very much so. I was head of the naval air mission at the time, and what happened was this was a time of the Berlin Wall, of course, and then-chief test pilot for Focke-Wulf had his six-month security vetting, and they found he had relations in East Germany, so he was taken off the job because it was classified, and I was asked to undertake it. Now, it wasn't testing Focke-Wulf products. They didn't have any of their own at that time. These were British aircraft assigned to the Germans, but they came straight from the manufacturer, usually by boat to Germany, and Focke-Wulf then put them in shape to be flown. All I did was test them and, when they were fit, hand them over to the Germans. So it was really almost an extension of my job.

But the wonderful thing was I had access to all the Focke-Wulf files when I was there, and they had survived the war. They must have been hidden away; otherwise, I'm sure either yourselves (U.S.) or ourselves (U.K.) would have appropriated them. But I had a wonderful time just going through all these files. They never stopped me, because I was doing a job for them. And I found out more about Focke-Wulf and Kurt Tank than I'd known by any means before, and the more I read, the more I admired Kurt Tank, whom I already admired, I must say, as a designer.

Kilanowski: Whatever happened to Kurt Tank?

Brown: Kurt Tank wanted to work for either America or Britain, and both of us were reluctant to take on any German designer because of their, if you like, their standing in Germany at that time. He wasn't necessarily sympathetic to the Nazi Party, Kurt Tank certainly wasn't. Willie Messerschmitt was. Dr. Heinkel was caught in the middle, so to speak. So that was the reason. So at the end of the day, I think that Kurt Tank went to work firstly in India, designed a fighter for them, and then in South America, but he never got a job within the European area again.

Kilanowski: Can you tell me about your experiences as a naval air attaché to Germany and as Commanding Officer of RAS, Lossiemouth?

Brown: Lossiemouth, yes, well, as naval attaché, of course, you are a respectable spy, if you like to put it that way. [laughs] And I had so many contacts in Germany already with my time there that it, for me, was a delightful occasion, and I met a lot of old friends, etc. Altogether, it was after some of the trials and tribulations of life, I found this

a very enjoyable job and made very, very good connections with the German Navy. Of course, I'd already trained them, so it was almost like an extension of that job, if you like. Lossiemouth, again, one of the nice experiences of my life, this was the biggest air station in Britain, it's a huge place with a runway so long that you need closed television to see the end of it, not in the context, of course, or challenge to Edwards Air Force Base's runway, but for us a very long runway. There were eight thousand people stationed there, and this was the training and operational training squadron area for the Buccaneer strike aircraft. So I had three and a half very happy years there.

Kilanowski: That sounds wonderful. And then it sounds like you were assigned as aide de camp to Her Majesty the Queen (Elizabeth II).

Brown: Yes. That is a social job, really. You are doing your ordinary job as a naval officer, but occasionally you get called as an aide to go and attend on Her Majesty when, for example, she goes to an event that has some aviation connection in any way, maybe to explain to the Queen something that's going on that might be of interest to her or comment on it. So it's a nice relationship, and as I had been her naval attaché before, it was, for me, a very happy occasion again.

Kilanowski: She is a great lady.

Brown: Her incredible devotion to duty almost begs belief.

Kilanowski: Indeed it does. You've experienced 2,721 catapult launches from a carrier and 2,400 carrier landings. Did you have any significant flights or landings with the other 300 launches? Did you land on the ground or did you have secret missions?

Brown: No. Let me explain. There are more than 300 involved. For every time I landed on a carrier, I wasn't shot off by catapult. I would say of these 2,700, probably about 800 have been made at Farnborough, because we had all the catapult research work done at Farnborough. We had every type of catapult that we could think of there, and I did, as I say, probably 800 to 1,000 at Farnborough, it was very busy, and the rest were done on ships because we had to change our catapult system when we took on American aircraft because you had a different method of launching aircraft from a carrier, and we had to turn to this when we had Lease-Lend aircraft. We found it so good that we eventually turned to the American system in total. It was a really first-class system. So I would say out of all these, probably two-thirds of them are on the American method of catapulting, the rest on the British. [laughs]

Kilanowski: Have there been any recently declassified missions that you can talk about that you couldn't talk about before, when you wrote your book (*Wings on My Sleeve*)?

Brown: Yes. One of the big missions that we had from Farnborough during the war was to steal a German four-engine bomber from the occupied French Zone, and that was done—I remember it well—on a Saturday afternoon when we were given Saturday afternoon off. This was just towards the end, getting on towards the end of the war, not

quite. It was September 1944. And a signal suddenly came through saying that the French Maquis, the Resistance people, had isolated a bomber at an airfield at Toulouse, actually, and if we were smart about it, they could hang on till we got in there and got the bomber out. So that was done with a bit of shenanigans. [laughs]

We took two research—radio research, not aerodynamic research—two radio research Beaufighters with us to conduct the aircraft safely back, in case the Germans ran after us. But by the time we got off and everything, the aircraft—it was dark and the two Beaufighters ran out of fuel over the Bay of Biscay and both were lost, but the pilots were not lost. And the funny thing about it was one of the pilots was a very heavily-built chap in the Beaufighter, and he felt very unhappy about bailing out. He'd ran out of fuel, so he's got to bail out or crash-land, he thought that, "At my weight, if I bail out, I'm bound to break something." [laughs] So he decided to stay with the aircraft and crash-landed on the French beaches, and they captured him and put him in a hospital along with a lot of Germans who were occupying, of course, that part of Vichy France. [laughs]

And this is almost unbelievable, but true—because we have it now in the Imperial War Museum, I think—but a German general came around and was dishing out Iron Cross second-class medals to many of the gallant Germans who had been wounded for one thing and another, and he came to our pilot's bed, and he sort of drew the blankets up to his chin and just lay there and had a second-class Iron Cross medal pinned on him by the German general and brought it back to Britain, when they eventually released him. [laughs] It's still a trophy in Britain.

Kilanowski: Well, that must have been quite a mission! Did you personally fly the plane out?

Brown: No, I did not. I was the translator for them, and the then-chief test pilot of Farnborough flew it back. I merely helped with translation of all the bits and pieces in the cockpit, etc.

Kilanowski: It makes for another wonderful book. [laughter] What drove your decision to start writing books, including your autobiography?

Brown: Well, this happened in 1960. When you're a member of the armed services, you are not allowed to write a book about your experiences, but in that year, we had a pilot recruitment problem. For some reason, recruitment was falling off. So their lordships, as we called them, the admirals who run us, decided that if I wrote a book, that my life story might—and I can't think why—encourage young men to join the Fleet Air Arm. My wife used to say, "On the contrary; it'd make them run a mile." [laughs] But nevertheless, this is what they told me to do, and so that was done. They gave me nine months to do it—sorry, three months to do it, and they took nine months to vet it. I took three months to write it. Everything was classified—well, a lot of it was classified, so it had to be withdrawn. So it was a book, but a skeleton book, really, and the one that's here now with us here, (Wings on My Sleeve) is the one that's declassified, with all the stories in it.

Kilanowski: Well, that's wonderful. How did you come to be elected an Honorary Fellow in SETP?

Brown: Well, from two sources. The British source was Brian Trubshaw, who was the chief pilot for Bristol (Aeroplane Company) operating—building the Concorde, because I flew with him, not often—no, I only flew once with him in the Concorde, yes. But he put me up. And the other sponsor was the head of your FAA here in America, who had been a test pilot with me at Pax River. So between the two of them, they must have swayed the board. [laughs]

Kilanowski: Well, I don't think it took too much sway. You certainly deserve the honor! Can you describe your experiences as President of the Royal Aeronautical Society?

Brown: That is a very high office in aviation for us. The Royal Aeronautical Society is the oldest aviation body in the world, and they'd never had a pilot as president. It is fundamentally, or was fundamentally an engineering organization, aviation engineering, obviously. But for some reason, they departed from this and asked me to be their president in 1983 and '84, and that's an overlapping year, and I was very happy to do that. It's particularly valuable to me because it strengthened very much my connection with the United States and also with Australia, with the Commonwealth countries, because I visited most of them during that period, Australia, Africa, New Zealand, these people. So it was really just a gorgeous experience.

Kilanowski: How did you come to be named a Master Pilot of Russia?

Brown: During the post-war period, the immediate post-war period, I wrote a book called *Wings of the Luftwaffe* about all the German aircraft I had flown. Now, the Russians also had a large number of captured German aircraft, and they fastened onto this because it helped their test pilots, because not only was it a lot of narrative, there were also many drawings of the cockpit, the structural details of the aircraft, etc., and they actually bought ten thousand copies of this book and distributed them around their various technical schools and colleges in Russia. And this really, this creation, was a mark of thanks, of gratitude, for me writing it and them enjoying it. [laughs] But there was a catch to it: they wouldn't pay royalties. [laughs] There we are.

Kilanowski: Can you describe your experiences as Chief Executive Officer for the European Helicopter Association?

Brown: Before this Association came into being, helicopters operated under totally different rules in every country in Europe. No two were the same. And this, when it came down, it's fine when they only operate in their own countries, but if they want contracts in other countries, chaos results because they're operating to different standards from us, and they either can't get the contract or they break our rules and so on, so forth. So what it boiled down to was getting about twelve European nations and knocking their

heads together and saying, “Look, we’ve got to sort this out and standardize ourselves. Otherwise, none of us are going to make any progress.” And it virtually boiled down to that.

But it was a wonderful experience, because they cooperated very, very heartily, and English was chosen as the common language, and I was quite astonished. We had meetings with these twelve guys, all from different countries, all talking English at these meetings, and some of the technical depth we went into was quite astonishing that these people could understand it. Oh, we had some very, very funny evenings and we had some very amusing—I could tell you a joke later about it. [laughs]

Kilanowski: I wanted to ask you about your experiences being inducted into the U.S. Navy’s Carrier Aviation Test Pilot Hall of Honor.

Brown: That was a great honor for me. I had many friends, of course, in the U.S. Navy, as a result of Patuxent mainly. Some of these astronauts were there, Al Shepard and John Glenn. There were people around there. And to go on to the old *Yorktown* carrier down in Charleston was an unforgettable experience, it really was. I just enjoyed every minute of it, and I felt really this is one of the honors you couldn’t ask for more, because I really had a very good rapport with the American Navy. I still think they’re the greatest fighting body of men in the world, frankly. The U.S. Naval Aviation nowadays is an incredible outfit. There we are.

Kilanowski: Since I’m an American, I really don’t understand the Orders of the British Empire. You’ve been honored with three of them: Commander CBE, Officer OBE, and Member. Can you explain those to me and their ranking and how this is bestowed?

Brown: The Order of the British Empire is the Queen’s Gift or the King’s Gift, as it was in the wartime, and it is awarded to the military. There is a Civil Division, but I’m in the Military Division, and it is awarded for some usually special, unusual event or occurrence. There are grades, and the grades really are dictated by the rank, your rank at the time that that occurrence takes place. Now, when I got the MBE, which is the lowest of that, I was a lieutenant and you can’t get higher than MBE at that rank, and that was for the first landing of a twin-engine operational fighter on an aircraft carrier. And then OBE, which, if you’re lieutenant commander, you can get that rank, and that was for doing the first jet deck landing. And CBE, which is you have to be a captain to get that, I got for, if you like, my career in test flight. So these are all good. I don’t like to be immodest about this, but I got six awards altogether. [laughs] And the King (George VI) said to me when he gave me the last one—actually, I got the last one from the Queen (Elizabeth II), but he gave me the fifth, he said to me, “Not you again!” [laughs] And I got the last one from the Queen, so that was—I’ve been very lucky.

Kilanowski: Well, it’s a very great honor and it’s very well deserved. Can you tell me about your experiences of being awarded the Distinguished Service Cross, the Air Force Cross, and the King’s Commendation for Valuable Service in the Air?

Brown: These, again, were all associated with events. The Distinguished Service Cross was during my service on *HMS Audacity*, the small escort carrier, and I was involved in the shooting down of two of these large four-engine aircraft and just the general protection of the convoy duties. Then the Air Force Cross was for all the work I did on transonic testing. And the King's Commendation for Valuable Service in the Air was for the whole development of a thing called the flexible deck, which was a rubber deck on which you landed an aircraft in the Navy without an undercarriage, just flopped onto the rubber deck without any wheels. That was developed over a matter of three years.

Kilanowski: How did you come to fly more different aircraft in the world than anyone else in the world?

Brown: Well, there were many contributory factors. One was, for example, at Farnborough virtually certainly every British aircraft ever built came through Farnborough and every American aircraft built during the war, because we exchanged every type of aircraft we built with America. But we were winning at the ratio of four or five to one on that basis.

Then at the end, I was sent around the world flying all the enemy aircraft, German, French—well, French weren't enemy, but their captured aircraft, their military aircraft. Italian, some interesting Italian ones, and Japanese. These just piled up. It was a totally fascinating time. And then at the end of the war, quite a while after the end of the war, our country decided that some of the European countries had lost their aviation expertise during the war because they weren't involved in the war, and therefore things were just marking time in their countries, and we offered to help any of them that wanted, didn't have test pilots because they hadn't time to form them. So I went around many of the European countries' manufacturers, flying their aircraft for them, to tell them whether they were up to scratch with the modern technology or not, that type of thing. So they just piled up.

Kilanowski: Did you contact the Guinness Book of World Records or did they contact you?

Brown: It was some of the people in the industry contacted the Guinness Book of Records and felt I must have flown more than most people, and so they asked. They did the investigation into one's logbooks, and they wrote every major aviation country in the world and asked them if they had anything to contest this, and it went on for quite a number of years till they sorted this out. They also had a set of rules. I mean, you had to be the commander of the aircraft, and it had to be one basic aircraft, not models or mocks of that aircraft. For example, I flew fourteen different kinds of Spitfire, but it only allowed to count that as one. So there were rules.

Kilanowski: That makes it even more difficult.

Brown: A bit.

Kilanowski: I also wanted to ask you what was your least favorite airplane to fly and why.

Brown: I think the least favorite was an aircraft called the General Aircraft L-56. Now, that's all the designation it ever had. It was an experimental swept-wing glider, tailless, and it had some appalling flight characteristics. The wings were swept heavily back and down also, they were at quite a difficult acute angle to the ground, and this meant that it had a large effect, ground effect, when the air got compressed between the wings and the ground and made changes of trim, very violent changes of trim on takeoff or landing. And, in addition, it had self-stalling characteristics which the pilot didn't have the power stop once it got away, and it would go into a tail slide afterwards. Now, that's a nasty thing, because there's nothing much you can do about that either till it sorts itself out or half sorts itself out. This was sent to Farnborough because the company felt they didn't have the expertise to fly it themselves, but they had a chief test pilot who was a very famous glider pilot. So at the end of it all, Farnborough said, "Well, we've tested it all. Here's the full report," and I flew it over to the company and handed it over to this chap, briefed him on it, but some few days later, he got killed in it. So it was a very nasty one.

Kilanowski: What was your favorite plane to fly and why?

Brown: Oh, well, piston engine, I had a lovely airplane called the de Havilland Hornet. This was a really hotrod little twin-engine airplane. It was like owning your own Ferrari. It was really rather nice. You could do anything with it on one engine, far less two. Bob Hoover would have loved it. And on the jet side, I think the North American F-86 Sabre, the F-86E, because that had a flying tail on it, and handling the controls were beautiful to handle, absolutely beautiful.

Kilanowski: You also have the distinction of having the most carrier landings: 2,407. What was your best carrier landing and also what was your most harrowing landing?

Brown: I think probably the one I most enjoyed was landing the Phantom, the F-4, on one of your ships, the *Forrestal*. I would say that I enjoyed most.

And the most harrowing was probably landing—I was shot in the face while I was on *HMS Audacity*, and I have no recollection of going back to the carrier at all and landing on or anything. But my flight commander says he realized what was wrong, and he was frightened I was going to fall asleep or fall unconscious, and he said he talked to me, talked to me the whole time to keep me awake, and talked me down onto the carrier. Well, he must have, because I can't recollect getting back at all. So I think they were a bit worried on the carrier in case I'd make a real mess of it and maybe probably damage the carrier on the landing, but it worked out fine. [laughs]

Kilanowski: Well, I guess you *are* the world's best carrier lander! I wanted to ask you about your involvement in the British Rocketry Oral History Program.

Brown: Well, after we had rocketry, of course, in the Navy for catapult launching and what you call here in America JATO, jet-assisted takeoff, which with us we call rocket-assisted takeoff. So I'd had some experience in that. These were, of course, solid-fuel rockets. And then I had some experience with liquid-fuel rockets when—well, only one powered flight, the Me 163. But I was the only Allied pilot that had flown the 163, so they fastened onto that. So I used to love talking with the rocket scientists. I was just interested in rocketry, and I learned a lot from them. I'm sure they didn't learn a lot from me, because I didn't have a huge amount of experience on rocketry. But nevertheless, it was just one of these fascinations.

Kilanowski: How were you selected for the Lifetime Achievement Award in 2007?

Brown: Well, that, I think, is merely because I did an extensive amount of lecturing to them. They somehow persuaded me to go each year and rattle on about something or other. [laughs] And we began to get outside rocketry a bit into reheat in jets and that type, because I did the first ever reheat run on a jet engine in flight, that's to say, with a jet aircraft. So, things like that, you know. If you're in the right place at the right time, they'll grab you and ask you to do it. [laughs]

Kilanowski: I'm interested in asking you about the University Air Squadron system, because here in the United States right now we have a critical shortage of aerospace engineers and potential pilots. Our young people are not entering the military in the numbers that we would like them to. I think Edwards is probably short right now 100 aerospace or flight test engineers. And your country seems to have a very good university-level method of recruiting these bright young people.

Brown: Well, the system, of course, appeals to students because it's free, and provided they show the right potential in their interview and pass their medicals, they can join the University Air Squadron, which allows them to fly free, provided they will toe the line and show up at the right times and do the stuff. Now, there is no requirement for them to join the services afterwards, but the hope is that we will arouse their enthusiasm so much that if they consider it, they will take that option. Our success rate is somewhere between 40 and 50 percent of those undertaken actually join the military services. So this, we feel, is worthwhile. There is no reason why that sort of flight training could not be given to—with no more promise than to be engineers as opposed to pilots, but give them this wonderful, sound background of having flying ability. I think that would enhance their job considerably. So in your case, I would restrict it to engineers because I don't think you have any shortage of military pilots as such. But it'd be worth a try, I think.

Kilanowski: I think it's a brilliant idea. What is your opinion on the effectiveness and validity of flight simulators? Do you have a problem with them?

Brown: No. Well, yes and no. I'll put it this way. I think simulators have improved incredibly over the last decade, and they are getting very, very close to really being 100 percent like the airplane, but there is still a shortfall of the real thing, and that bothers me

a little, but not too much. That's beginning to fade now because things are getting so much better. But the big advantage, of course, is it is so cost-effective when the pilots can do a lot of their flying without actually flying. Now, I know most pilots don't like it that way, but, unfortunately, economic constraints force these things upon us. So there's a lot to be said in that direction, and, of course, there is a huge amount to be said for the fact that you can carry out emergency drills on a simulator with impunity, and this in itself is a huge saving. If you're going to fail a chap's engine on takeoff, even if he makes a mess of it, there's no actual crash as such. So for training, this sort of training, is invaluable.

Kilanowski: Can you describe your activities and experiences as Chief Executive of the British Helicopter Advisory Board?

Brown: Well, in this case, my brief was to bring all the various companies together who were bidding against each other, so to say, and going their own sweet way, to bring them all to heel and say, "Look, if we all do it collectively together, we'll do a better job." And the reason for this was to give the public more confidence in the industry as a whole and show them the tremendous flexibility and versatility of the helicopter. For example, when I started, we had one police force in the country that had a helicopter. That was the London Metropolitan Police. Now virtually every county in Britain has a police helicopter. That's an example of what sort of work we've done.

Kilanowski: And that's really tremendous. Why did Britain emphasize vertical flight rather than traditional carrier operations, and what are your feelings about that?

Brown: Well, vertical flight was forced on the Navy by *force majeure*. We reached a stage in 1964 when we looked as if we were in a big buildup in the Navy. We had received the Phantom fighter, and we had just laid the keel of a new carrier when the Labour government came to power and cancelled the whole thing, the carrier, and made it clear they were wanting to get rid of naval aviation. In desperation, we accepted small ships that had flight decks on them but no arrestor gear or anything like that that would operate normal naval aircraft. But we saw it as the only hope of survival. So it was, I say, a *force majeure*.

Now, for that situation I would accept it, but the VTOL aircraft will never match the ordinary fixed-wing aircraft for load-carrying capability. Give you a quick example. In the Falklands, we had a carrier standing seventy miles off the Falkland Islands, an operating Harrier aircraft, which had to fly seventy miles to the Falklands and then be on combat air patrol for half an hour overhead, then seventy miles back. It could just make it with the fuel the Harrier carried. If we had had the Phantom and a normal carrier, we could have flown halfway to Argentina and killed the aircraft coming to the Falklands before they got anywhere near the Falklands. So you play a big penalty in operational capability if you go VTOL. There are advantages, of course, of being able to land vertically in small spaces, etc., but, to me, give the capability every time.

Kilanowski: You mentioned over the past fifty years that you would rate four airplanes as sensational. The Me 163 we talked about. You named the X-15. Can you tell me why you thought that plane was sensational?

Brown: The X-15? I think it opened new boundaries in space and, if you like, in the area between where airplanes normally operate and space. It's just bridged the two. This is the airplane I'd most liked to have flown in life. Scott Crossfield encouraged me to ask the U.S. Navy to consider me to fly this thing, but, of course, I wasn't a U.S. citizen and it was too highly classified. But this was a magnificent airplane. It has left its mark forever on aviation. The boundaries it crossed and the way it opened the envelope of performance is quite impressive, incredible. And I would say in its short career, it probably made more impact on aviation than any single airplane's ever done. It was sensational because of that, but also because the designers were prepared to take the risks, realizing that they couldn't make it a foolproof airplane, and the pilots would go along with them too. I mean, Scott was involved not only in the flying of the airplane, but in the design features of the airplane, and this is wonderful. They have this business of the pilot getting involved in design, like we were talking earlier about Kurt Tank with his designs, pilot and the designer working together.

Kilanowski: I should back up and ask you what was sensational about the Me 163.

Brown: The innovative features. It had a host of innovative features in that one airframe. For example, it had rocket power, and not only rocket but a throttleable liquid-fuel rocket, never been achieved before. That was one thing. Secondly, it had swept-wing, which at that time were unusual. Thirdly, it was semi-tailless, which had always been thought difficult to design to acceptable standards. It had a fixed-skid undercarriage, and, well, it had performance, which, as we've already talked about, was just about four times better than anything that was going at the time. So it had a lot of huge innovatory features, and its design influenced the whole of aviation immediately after the war. It was the one airplane that yourselves (U.S.), ourselves (U.K.), and the Russians all locked onto, not for its rocket ability or anything, but just for its mass of innovative features.

Kilanowski: What was sensational about the Concorde?

Brown: Concorde? The wing design of the Concorde came from German technology—and these were the high-speed aspects—the slow speed came from British technology, and the power plant came from British technology. The construction side came a lot from French technology. So it was an amalgam of different designs. And to do this, to carry passengers and not military crew, I mean, it was ludicrous. At times I find myself arguing with a fighter designer about the top speed of his airplane and say, "I couldn't accept that speed, because my grandmother can do Mach 2 in the Concorde." [laughs] So, you see, it was sensational for its time. It really was.

Kilanowski: What was sensational about the B-2?

Brown: Because it has accepted tailless or all-wing design, which is extremely difficult to achieve satisfactory flight characteristics without synthetic stabilization, and the B-2 has achieved that in a large bomber, which is remarkable. You may remember the first Northrop bomber crashed (YB-49). I think the (Glen) Edwards of Edwards Air Force Base, it was Captain Edwards who was the pilot on that occasion. But that was because in those days the stability was knife-edge on that type of aircraft. Now with synthetic stabilization, it is possible to have a remarkable airplane like the B-2.

Kilanowski: I wanted to ask you what benefits you see SETP having to the international flight test community.

Brown: Well, the big benefit, of course, is that you meet other test pilots from a variety of disciplines all over the world, and you can only benefit by learning from other people, listening to their experiences, because wherever we go, there is always something new cropping up, and I think to be able to come to a session like this annually from all parts of the world and listen to each other's tales and experiences, not only in lectures but exchanging on an informal basis, I think that is a huge benefit.

Kilanowski: What are your hopes for SETP for the future? How would you like to see this organization grow or change?

Brown: Well, I don't think it has to change much. If it can grow, that's another question, because at the moment, of course, the number of test pilots all over the world are diminishing, and we've got a problem to face up to there, because airplanes—of course, there are astronauts coming along when they are eligible, but not in huge numbers at the moment. And airplanes are gradually being whittled down and giving way to UAVs. And what are we going to call a guy who drives the UAV, sitting at a desk somewhere? Is he going to be called a pilot? Is he going to be called an engineer? But whatever he's called, I think we're going to have to rope him into SETP because we've got to be able to live side by side, piloted aircraft and UAVs. So I see growth in that direction, provided they take the right steps.

Kilanowski: When I look over your career, a young test pilot can't hope to ever have the number of flights, the number of first flights, and flying all of the different airplanes and the adventure, the high adventure that you've had in your life.

Brown: No. Things, of course, must change, not only with time but with technology, and one of the sad things in some ways to see—it would certainly have saddened me if I'd been a test pilot in the present generation—is that they're being limited to fly. It's going to come very soon to one type of aircraft. It's not because the airplanes are particularly difficult to fly, but what is difficult is to master the systems involved. They are very complex, they are computer orientated, and if anything goes wrong, you have got to know how to sort it out, and this requires a tremendous amount of knowhow in the electronic and communication sort of disciplines. Therefore, they're going to have limited careers. But provided they take the right attitude and say, "Right. Well, it's a more difficult airplane than these old guys used to have to deal with," and realize that

they're sitting in a very, very valuable piece of machinery. Nowadays, a crash with a modern airplane is a financial disaster. So they have huge responsibility, and that will test their mettle.

Kilanowski: What was your biggest disappointment, your greatest disappointment in the field of flight testing or aviation?

Brown: Oh, without any question, I think the fact that I never could get access to fly the X-15. This airplane always fascinated me, and I talked a lot about it, of course, with the guy who was really in the middle of the whole thing, namely Scott Crossfield. And he was all for me trying to persuade the U.S. authorities to let me fly it, and I had plenty of people who were willing to back me, but by the inquiries we made, it was quite clear that from a security aspect, nobody else was going to fly that airplane except a U.S. citizen. So I could understand that, of course. But, nevertheless, I would have loved to have gotten my hands on it. [laughs]

Kilanowski: What do you think was your greatest achievement or contribution to the field of flight testing?

Brown: I think the fact that I was involved in a tremendous amount of pioneering work on naval aviation with such things as the angled deck and the steam catapult, heavily involved in those, and also heavily involved with transonic work and attempts to break the sound barrier. So these two things, I think, probably run in parallel in my mind as the highlights of my career.

Kilanowski: What are you most proud of in your life?

Brown: Well, I think I would say in trying to keep my country ahead of the game in aviation research. I think we probably achieved it in my day, but it was obvious that it was running away from us and the United States were going to move in, and this inevitably has happened. With the huge resources, it was inevitable. And I've no worry about that. It's in safe hands, believe you me, in the United States. So I'm just delighted I was around when we were top dog for a while anyway. [laughs]

Kilanowski: If you were standing in front of a group of young test pilots that had just graduated from a Test Pilot School, what would you say to them about your life and career, and what's the best advice you could give them?

Brown: Well, I would say to them don't fret if you don't have the same career, because it was an extraordinary set of circumstances, and you can't expect these sort of things to be repeated, and it's just as well they aren't, because some of the circumstances like the World War II weren't the happiest of circumstances. But I would say that you have got to realize you've been given a huge goal for any job you're given as a test pilot. You've got to prepare yourself for these, because you mustn't take test flying lightly. There was a period when some people were, and it cost them dear. You're playing not only with the airplane, you're playing with your life and a lot of responsibility that your country makes

an advance in aviation. So you've huge responsibilities, face up to them, and grasp them with both hands.

Kilanowski: How important is integrity to the test pilot?

Brown: I think integrity is everything. You don't have to worry too much about it because nowadays, and in my day, even, everything was monitored and all flight tests were recorded on what we called auto observers, so the data was there on camera and on record. But you have got to realize that you're being asked to do things that sometimes you have to give an opinion as opposed to doing a factual bit of work, opinion based on your experience, and in these circumstances, you must examine very closely what you are going to say on the basis of your experience. If you haven't got the experience to answer the question honestly, then it's best you don't attempt to answer it at all.

Kilanowski: Thank you. And what are your thoughts and hopes for the future of flight testing and aviation?

Brown: Well, I think we've covered the fact that UAVs are now appearing on the horizon. That is going to affect things enormously. The number of aircraft that are piloted are going to diminish inevitably. Therefore, the number of test pilots associated with them, are going to diminish. So the main ways that they're going to be open in the future are as astronauts, rather than test pilots, I think, because of the just different way of which we cannot change, the way technology is taking us.

The greater public are not too happy about seeing young men killed for reasons that they maybe don't fully understand and maybe sometimes feel are risks rashly taken. But that's only because they don't understand it. The risks are taken. The test pilot is fully well aware of what risks he is taking, and if he's not prepared to take them, he must step forward and be counted and say, "I'm not prepared to take that." But if you're in it, you're in it up to the neck.

Kilanowski: Thank you. Is there anything else that you'd like to comment on about flight testing or aviation or your career that we haven't covered?

Brown: No. I think I have a certain sympathy nowadays. Quite recently I was at one of our test establishments, and while I was there, the young test pilots just received a signal from the Ministry of Defense saying that a number of types that it could fly were going to be limited to two and very shortly that would be brought down to one. We've already spoken about the fact that that is not because airplanes are more difficult to fly; it's these complex systems. But I feel sorry for them that they haven't had the wealth of experience that was given to us, and I always found it fascinating to see some shapes of aircraft that I wanted to fly always and actually got the opportunity to fly, with the exception of the X-15. [laughs]

Kilanowski: Thank you. Is there anything else you'd like to add?

Brown: No, thank you.

[End of interview]