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Interview with John Wright

John Wright

WRIGHT BROTHERS - CHARLES F. KETTERING

ORAL HISTORY PROJECT

UNIVERSITY OF DAYTON

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JOHN WRIGHT

Interviewed by

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JW Wright and this is the ninth of February, isn't it?

SB I guess so.

(break in tape)

SB Tenth of February...

JW It's the eleventh.

SB 1967...

JW Eleventh, yes...

SB So.

JW Yes, I knew something was wrong.

SB (chuckle) How did you first meet Mr., the other Mr. Wright?

JW I met Mr. Orville Wright in 1917, when I became a member of the Engineers Club.

SB I see, yes. Was he an easy person to meet, do you remember?

JW He was at the time...

SB Is that so?

JW He was a very easy person to know, at that time.

SB Yes, did he have a big circle of friends, do you remember?

JW He had, he knew a great many people. I don't think he had too many friends.

SB Yes, now when you were acquainted with him at his laboratory, where was the laboratory?

JW It was on Broadway, just off of Third Street.

SB Broadway just off of Third, was it a big place or small?

JW No, it was very small place. He kept it as private workshop for himself.

SB What kind of work did he do there?

JW Whatever pleased him.

SB Alright now, what do you mean by that?

JW Well, if he wanted to work on his automobile, that's where he did it. And he kept his records there.

SB Oh, in the early days of the company...now at this time he was, he was actually retired?

JW He was not actually active in any company. I do not know what his company relationships were, other than that he was a consulting engineer for the Dayton-Wright Airplane Company and he also did a lot of writing for the Encyclopedia Britannica; for instance, he wrote all of the aviation articles in the Encyclopedia Britannica. He had a rather large correspondence with people of various places. I first met him rather intimately in the later part of December of 1917. I was working for Mr. Kettering at the Delco at the time, and he took on a project for the Signal Corps of the U. S. Army. It was to be a rather unpleasant surprise for the German army and it became what was Dayton's best kept secret. There is a replica of the device at the Air Force Museum. And since it's pretty well known there's no point in being too secretive about it anymore. But this device was a guided missile; it was supposed to dump explosives in Germany at any selected point to which it was aimed. Mr. Wright was consulting engineer of the Dayton-Wright Airplane Company and a good friend of Mr. Kettering's and Mr. Kettering asked him to design the airplane for this particular device. He formed a group of engineers; it was officers in one of the Dayton downtown buildings to design an engine for this thing. This engine was later built by Ralph D. Palmer in his machine shop right close to the Speedway in Indianapolis. And he assigned me the job to design and build the guidance and control mechanism of this thing. Now, at that particular time my this job was just as fantastic as a trip to the moon was twenty years ago. It was just as fantastic as shooting a satellite by Venus or some other planet at enormous distances in the light of what we knew at that particular time. For example, the device was supposed to strike a target, at a range which was almost exactly the longest uninterrupted flight that had ever been made in an airplane. So problems arose, problems to which there was no answers either in books or anywhere else. And as a result,

a lot of test work on the control and guidance system of this device was done in the wind tunnel in Mr. Wright's laboratory on Broadway. It was one of the few wind tunnels in existence at that particular time. And of course, Mr. Wright was very much interested in the work, that is advice, his help wherever he could. And for a period of about a year, we was in and out of that place almost every day.

SB Yes, was this what was called the Kettering Bug?

JW That's it.

SB Yes, what did they use for thrust, to get this thing off, off the ground?

JW It was an engine. They had an engine.

SB They had an engine. Well, were the explosives in the nose? What did they use? What was the idea?

JW The explosive was in the fuselage, that was a rather interesting device. I said Mr. Wright designed the air frame he did, but Dayton-Wright Airplane Company worked out some very unique manufacturing schemes to build it. It was a very nice little aircraft. It had a wing span of about thirteen feet. It was about ten feet long. But it was designed to use up all the scraps of the spruce wood that they couldn't use for making DH airplanes at Dayton-Wright Airplane Company, because in those days, all aircraft was built of wood. There was no metal, and they used spruce, because it was a pure grain, strong wood; they carved it into fantastic intricate shapes and this, particular job was designed to use up the short lengths and the scrap wood that couldn't be built into DH Airplanes. The wings were covered with paper, the fuselage was a cylinder of cardboard impregnated with rosin, about five feet long. The tail section was a cone of cardboard, and it was so designed that it could be put together very quickly. One of the specifications was that it must be packaged in a crate with minimum cubic foot capacity. Because all transport to Europe was by ship. And the cubic contents, the cubic space occupied by a box, was vastly important, because

that determined how many boxes the ship could carry. So this device was designed to occupy the minimum cubic space when packed, yet it was required that two men from the time that they touched the box, till the time it was in the air, less than five minutes would elapse. A fantastic assembly job. The thing was all put together so it had bolts of one size, so that it took only one wrench to put it together, and each box carried two of those wrenches. The explosive was in the lower half of the fuselage and the control guidance mechanism was right above it. And it was so designed that when it reached its range, the mechanism operated a latch that released the wings, the wings just folded up the device, the wings folded away and then the fuselage with its engine, became a free falling bomb. And it was very, very...

SB How far, how far was it supposed to go?

JW Well, four hundred miles was its maximum range...

SB Four hundred miles, oh my goodness. Well, how, how, how would you control this thing after it was gone, you mean it still had to have a control device?

JW Oh yes...

SB ...that led it.

JW I...

SB What did you, how did you do it?

JW The, artillery range officer gave the compass directions and the distance, to the target. That's all that was necessary to know. Then the guidance mechanism was just rotated around to where the compass correction read that many degrees, we set the distance on a log if it was, since this was a artillery project, it all had to be in yards, and the range you would say, fifty thousand two hundred and ninety yards, why we just set five-o two nine-o on the distance control mechanism and as soon as it took off, it began to count backwards, each yard, and at the end of that time, why then the wings folded up and it became a...

SB How fast did this thing go?

JW Well, it depends on the tail wind that captured it. It would travel around sixty, seventy miles an hour.

SB Four hundred miles.

JW Four hundred miles.

SB That's really something. Were any of them ever used?

JW Fifty were built; there was none ever used. This whole thing was one of the most fantastic and most ironical stories that you ever saw.

SB Were they ever transported to France?

JW They were not.

SB They were not. They were kept here in this country.

JW Yes, to anticipate your question a little bit. Well, I can't tell you that without telling you the whole story.

SB Well, we'd be happy to hear it. (laughter)

JW Do you want me to tell that story?

NH Oh, I'd be glad to hear it.

JW Well, now this record will have to go in Mr. Kettering's file, not in Mr. Wright's file, because this is, this is Mr. Kettering's deal, not Mr. Wright.

SB That's all right. We won't worry about that.

JW On the twenty-fourth day of December 1917, that was Christman Eve, Mr. Kettering took on the contract with the Signal Corps to build this device that I have been describing. And he walked out of his office over through the office where I was working and he says, get your stuff together, and go down to the garage and get in my car and I'll be down shortly. Now, Mr. Kettering was a very busy man. And if he went through any of his plants and saw somebody doing something that he thought he could give them a better job, why he just went up to him and told him to go ahead, and he didn't bother to go tell the supervisor, he hired supervisors for that purpose, and it was up to them to know what was going on. So he told me to go down and get in his car, and he never told my boss, and it was the next year before my boss found out where I was gone. But

he took me over to a residence, just north of Rike's new garage downtown. It was on property that's now occupied by the Talbot Building, and here had set up a laboratory to do research work and he took me in what was the stable of this fine old mansion, they were rapidly converting into a machine shop and an office. And he says, now this is your office, and here's what you've got to do. And he told me about the specifications of this thing that he had taken on. It was to have a maximum range of four hundred miles. It was to have a range of two hundred miles carrying two hundred pounds of explosive. It was to weigh less than five hundred pounds. It was to be packaged so that the two men could unpack it, set it, and fire it within the space of five minutes time, and it was to have a range such that it could be controlled over that length of space. And he says now your job is to design the guidance and control mechanism for this thing, and then he told me about how he had asked Mr. Wright to do the air frame and so, originally an electrical man, I spent Christmas day and the next couple of days in fixing up what we then called a wireless system; we call it radio control today. And when the boss come in, a couple of days later, he says, now, look, you know better than that. He says this thing, we are not going to have any such devices as that because if it gets over the German lines, all they got to do is to jam the thing, turn it around and fire it back at us. He says, we're not going to have any of that kind of thing. So then we started to look into the other means of controls. Height was one problem that we had. How to control this at a preset height. And of course we tried to do that with a barometer. But there were no barometers available that were sensitive enough to control it like we wanted to. So we went down to the Banner Bazaar and got a dozen nine inch tin pie pans. And by drilling a hole in the center of the bottom of each pan we would take and put the two pans bottom to bottom and solder them and then we would take another pan and turn it upside down and solder around the edges, and eventually we got us a bellows about so long and they made an excellent and than an ordinary barometer did. You could measure the height

of that chair with no trouble at all, and we could control it within a couple of feet per height. And of course, eventually we got the Taylor Instrument Company to make us a barometer that we liked. And we tried to control the direction by means of compasses and what have you, and well, in that process we built the first earth invector compass that was ever built. And it became quite an instrument on the aircraft at a later date. But still that wasn't sensitive enough. Then we started to used the gyroscope and at that particular time, the Sperry Gyroscope Company was the one people in the country that knew anything about this thing at all. And the boss got Elmer Sperry out to... (break in tape)

JW Eventually we settled on matters of means to control but being a bunch of dumb clucks, we didn't know much about this thing, and we felt that we ought to know if something, a little more about it, so we built one that weighed about thirty pounds, the whole thing. I think weighed about thirty pounds, and it was a vicious thing; it was a man killer. I don't know if you know about gyroscopes or not, but if you want them up in a certain way, they will react at ninety degrees to whatever force is put on them. In other words, if you push it this way, it would go up, it would go down, depending upon the way of the currents; if you push it down, it will turn around. It's quite an eerie feeling. So we played around with this thing for quite a while. One day, Mr. W. A. Chryst came in, he was chief engineer at Delco. Had a suitcase in his hand, and when the boss come in he says, let's have a little fun. So he puts this thing in his suitcase and pointed it toward the door of the Miami Hotel, which was just across the street. Primed the thing up and Mr. Kettering picks it up and walks across the street toward the hotel. I run around to get in the lobby to see what's going to happen. And this was in the afternoom when all the girls were down to the Miami, entertaining the soldiers, officers that is, they was having a dance, and the lobby was crowded, in comes the boss with this suitcase. Well, the porter runs over and he grabs the suitcase and he takes it up to the

desk and he started to swing it around with a flourish, to set it down in front of the desk, but the suitcase didn't swing. The suitcase just rared up in front of his face.

(laughter)

JW And he folded his arms around it and down they go on the floor and of course every time, he would push this way, the suitcase would go just ninety degrees away.

(laughter)

JW First he was on top, then the suitcase was on top; couple of these females began to scream, and that brought the rest of them, and the people were screaming as the porter was wrestling the suitcase, and finally got up on his feet, and grabbed hold of the suitcase, and it shot between his legs and started to crawl up his back, and this guy was being tied up into a pretzel. So we had fixed it when we put it in the suitcase with a trip, had a little ring with a string that went down, you could pull the string, and that would free it, and it would be all free. So I figured the show had gone far enough by this time, and I reached over and pulled the string, grabbed the suitcase and went out through the kitchen of the hotel across the street and put it away. Well, I went on back to see what the fun was, about the time I got in the middle of the street, here come the Black Maria on the run. The paddy wagon at that time, was drawn by two mules, and here it would come down the street, the, the mules at full speed and slowed up in front of the Miami Hotel and out piled the cops, somebody had pulled the police alarm and they went charging into that mess of screaming females. Finally they got them quieted down, and the cops was then told the most fantastic story they had ever heard. Everybody swore up and down that this porter was wrestling an animated suitcase. Now everybody saw it, everybody told the same story, but nobody could find the suitcase. Nobody. So finally the cops says now listen, he says, you people better go in the coffee shop and get yourselves about three cups of good black coffee. And lay off of this giggle

water, because it makes people see things what ain't. And they turned around and went back to the police station. And at this moment, the case of the galloping suitcase is an unsolved mystery in the files of the Dayton Police Department. (laughter)

JW But the, as time went on, along about the middle the December, June or July I think, we had this thing ready to fly. And we flew it down at old South Field, which is down on the corner of what's now, Dixie, southern Dixie and Stroop Road. It was the old Cincinnati Highway at that particular time, and the flying field for the Dayton-Wright Aircraft Company was on that spot, it's all built up into houses now. We had one hangar over in one corner of the field, in which we did our work. When it come time to fly it, well the boss and the military, got together and blocked all the roads leading to the place, and we flew the first one, with practically no witnesses. Because we didn't want anybody to see it. But after that, we'd go down about four o'clock in the afternoon and get all set up and the shift from the Dayton-Wright would leave and by five o'clock there would be nobody around and we could fly these things all we wanted to with nobody seeing them. We used to set them so they'd fly around the field two or three times, and then crash in that graveyard over in the corner of Stroop and Route 25. We did that for a lot reasons, first because the people that was there didn't care, and it didn't hurt them anyhow. (laughter)

JW And anybody else didn't have any business being there, so it was a good safe place to crash them.

SB They could, they could turn then.

JW Oh, yes.

SB They just didn't go straight.

JW They could set any program in them that they wanted to.

SB Was this ever used by the military in World War II?

JW It was not. And I'll tell you about that. In those days, an airplane was a

rather uncommon occurence to most people and it, if they saw one was setting out in field someplace, they sey along the edge of the field and wait till they had done something, if they sat there all day. And occasionally a crowd would see, some people would see this thing setting out on a field, and they'd crowd up along the fence and we didn't want them to know what was going on so we had a device that worked pretty good. We had an old Dodge ambulance over in one of the other hangars, and old Dodge olive drab with a great big red cross painted on the side. It had no siren but it had one of the exhaust whistles that would wake the dead.

SB (laughter)

JW So we'd get all ready and there'd be a crowd around the fence, and we'd just run this ambulance out over to the hangar, a couple of guys would jump out and run in the hangar, pretty soon they'd come out with a stretcher in which we'd put a couple of pillows, and from that distance, it looked like an individual was laying on the stretcher. Put him in the ambulance and take off, all of thirty-five mile an hour, with the exhaust whistle blowing. Up the road toward Dayton, and everybody would fall in behind the ambulance and follow it.

(laughter)

JW Very, very seldom did anybody stay and see the airplane; they all followed the ambulance.

(laughter)

JW Then we could fire them. As we pleased. Well, eventually along about the middle of September, we thought we had the thing all pretty well done, so the boss invited some people to see it perform. Now there was George Squier who was head of the Signal Corps, and his staff. And Colonel H. H. Arnold, who was the aid to General Pershing, and incidentally he became the famous Hap Arnold of World War II. But he was General Pershing's aid at that particular time. Colonel H. H. Arnold who was the liaison officer between the military and Mr.

Kettering, and there was Orville Wright, there was Henry Ford, there was Thomas Edison, Rollinsbury, and there was several others of quite prominent, renown. And to see this thing the boss had built a kind of a bleachers along one side of the field, got all these people to sit in that area. It looked just like a bunch of buzzards sitting along the fence, so we set a couple of crates out and they started to watch, and we unpacked one. Put it on the launching dolly, fired it well within the five minutes, and then followed what the military report says was the most remarkable flight in the history of aviation. Because every control mechanism on that thing went haywire and that airplane did stunts that every pilot in the country knew, and many that they didn't. It looped and it twisted and it turned and it flew upside down and it did Immelmanns, and it did barrel-rolls and it did what have you. We began to get concerned, how was we going to get this thing down, and had an old DH on the field over in the other corner, it had a couple of machine guns on it, they got somebody to get that thing wound up to go up there and shoot it down, but before they could get it up in the air, this thing come around and made a dive right at that bunch of bleachers, and you...

SB Oh, no.

JW ...never saw guys disappear so fast in all your life, prominent men, of every description was hunting for a place to hide and there wasn't any place to hide. And some of them was even trying to hide behind their own shadows.

(laughter)

JW And this thing come down and it just missed the top of that, well the whole crashed in the graveyard, like it was supposed to.

(laughter)

JW So the boss, says, now look fellows, he says, these people have come a long ways to see this thing fly and by blankity-blank, they're going to see it fly; now you get another one ready and for heavens sake, he says, put in it just enough fuel to go around the field twice and crash in the graveyard. In the

mean time, he says, I'll get these guys back up on their seat and see what happens.

(laughter)

JW So we got another one ready and a fellow poured out about a half of a teacup full of gasoline put it in the tank, and screwed the top of the tank on and he never looked to see what was in the tank, we fired this one and it was a perfect shot. It went out to the end of the field, made a hundred and eighty degree turn, came back over the field and headed right straight at the boss's house. Up on the end.

SB Oh, no...(laughter)

JW Right staight at it. It went over the top of that house with less than two inches to spare and right between two chimneys and disappeared from sight.

SB Oh dear.

JW Now this was a mess because...

(break in tape)

(end of side one)

(start of side two)

JW So, three of us jumped in the boss's car along with the boss; it was a Packard touring car. And like everything else he was a superb driver; he could hold his own with Barney Oldfield and Louis Chevrolet, and Ralph D. Palmer, any day in the week that they wanted to try. And he took out after this thing, and there was no paved roads in Montgomery County, all the paved roads in Montgomery County was from the front of Gov. Cox's residence to the city of Dayton. And this was out Stroop Road, and it was a gravel road, ninety degree bends in it wherever there was a bend, because it followed property lines, so the boss takes out after this

thing, and he had a trick that was very effective, when he'd come to a corner. He went into it full speed until the front wheels was just about in the middle of the intersection, then he cut them just as hard as he could and tramped the accelerator down to the floorboard, well the back end come around. He had a shower of gravel and what have you, but it went right straight down the road every time. It was rather disconcerting to the guys in the back seat.

(laughter)

JW But it was very effective. So General Squier and several of his staff, jumped in the car and followed us. We got down oh a half a mile or so from the place. Saw a farmer out in the field, putting up on his hay stack. Well, we jumped out and run over and asked him if he'd seen an airplane come by. He started to cuss, blankity-blank flyer took the top of my haystack and if I ever get my hands on him; we don't know what he would have done, because we left him standing there talking, and went on down to about where Town and Country shopping center is now. There was a big dairy farm, and I never saw such a loco bunch of cows in all my life. Those cows were running and jumping, the farmer was running around with a pitch fork and the farmer's wife was out with her apron waving it up and down trying to herd these cows back in the barn, so we stopped and asked him, and if the haystack fellow cussed, this guy was the master at it. That blankity-blank flyer, he come by here and scared the cows and the cows won't go up to the milk barn because they're scared and where in the blankity-blank am I going to get milk to pay, to for my customers tonight, and who in the blankity-blank is going to pay me for the milk that I ain't going to get. And we left him talking, but we learned a lesson, don't stop. We just kept an eye out for some guy

putting the top on his chicken house or for a bunch of crazy sheep or what have you and went on down Stroop road and clear on down through this little town of New Burlington, on down across a covered bridge pretty soon it was just getting dusk then, just real dusk. We see a bunch of lights over in the field about seventy-five yards from the road. We jumped out and run over there, and here was about twenty-five or thirty farmers. Each one of them had a lighted lantern in one hand and a shot gun in the other. And here was our airplane. They was organizing a posse to go out and find the pilot. We couldn't tell them there was no pilot in there, and the last thing in the world that we wanted them to do was to go hunting for one, and while we were standing, General Squier and his staff come up to know what the trouble was. They was going out to hunt for the flyer. In those days, all flyers wore a uniform, a standard uniform. Northford jacket, pair of peg-topped pants that fit into footees, and a cap. And whenever he wanted to make a flight all he needed to do was button his jacket and turn his cap around backwards on his head, like a baseball catchers and he was ready to fly, and that was the mark of the flyer, Northford jacket and pegged-topped pants. General Squier looked around and he saw a second lieutenant. This guy had on a cap ,he had on a tight-fitting jacket and he had on the most glorious pair of pegged-topped pants I ever saw. Now each leg of that pair of pants would have done for a wing for a now, B-52 now. The most glorious pair of pegged-topped pants I'd ever seen in my life. General Squier says there's the flyer, he says, we picked him up a couple of miles back, he says we'll take care of him, Well, the farmers figured the guy was in military custody and from the tone of Gen. Squier's voice they figured that he would be most properly

disciplined; they fell to and helped us hunt the pieces of the airplane, and we found all but a piece of one wing. By this time, it's nine-thirty, ten o'clock. So we left one of the poor second lieutenants to guard it the rest of the night, started back to town. Well, I had a problem that was on my mind, I had a date with a very nice young lady in Dayton to take her to dinner. And here I was twenty miles from Dayton it was long past the dinner hour; I knew I wasn't going to get any dinner. I knew she wasn't going to get any unless she bought it herself. And I had to have some kind of a story to tell that gal that would pass muster. Now I couldn't tell her where I'd been and what I had been doing. The story must have been pretty good, because she married me.

(laughter)

JW And when the Wrights were put on exhibition out here at the Air Force Museum, we were among other guests of the occasion. And for the first time she found out why she'd been stood up on a date fifty years ago.

(laughter)

SB (unintelligible)

JW So the next morning, we had a meeting and the military said that they were satisfied that the thing was ready to go. It was agreed that Colonel Arnold would go to France and advise Gen. Pershing what was happening and find out just where he wanted to use it and when. They gave Mr. Kettering orders to manufacture fifty of these with all possible speed and to get in shape to build them in quantity as soon as possible. And they decided I would be commissioned a Captain in the Army and take the first fifty to Franee. Well, Colonel Arnold left, caught a boat in New York, and on the way over he took the flu, that heavy epidemic that swept through the country in 1919, and he took the flu. When the

boat got to England, they took him to a hospital in London, all too sick to talk. When he come to so he could talk, he found out that the war was over, the, the Germans had surrendered and the Armistice had been signed, and we found ourselves with fifty of the things already built and ready to go. No war. So the Signal Corps decided to take them and take them to Florida to one of the airfields in, well it wasn't an airfield, it was just a big open space in Florida away from everybody where nobody would see them. And they used these fifty to fire in Florida, with a great deal of success. Then a squabble broke out. The Air Corps which had been separated from the Signal Corps and made a separate Air Corps Division during World War I said the thing belongs to us because it flies. The artillery says it belongs to us because its just a great big artillery shell. The coast guard says it belongs to us because it's the ideal coast guard weapon. The Signal Corps says it belongs to us because we developed it. The Navy didn't want no part of it at any price for any of that.

(laughter)

JW So while they was trying to decide who was going to have this thing, Charles Evans Hughes come out with his famous peace proposal, in which the United States would sink all of its battle ships and the other countries would sink the blueprints of battle ships that they might build sometime, and Wilson got his League of Nations, and all was safe for Democracy. Everybody had beat their words into plowshares, nobody was going to study war no more. And the military couldn't get a dime in appropriations to carry this thing on any further. They didn't want it floating around the country. They wanted to keep it under cover as much as possible. So they asked Mr. Kettering to take out patents on it, in

his own name and keep those patents in the patent office as long as possible. Well, he prepared patent applications and then by various legal maneuvers we kept the thing in the patent office until about the middle of the 1930's and the patent issue. If I'm not mistaken, it's the largest and longest patent ever issued by the patent office. It's a book about a half-inch thick. And at that time, all patents could be bought for five cents a copy, it made no difference what size it was you could buy them; the public could buy them any number they wanted, five cents a copy. Well, of course nobody in the United States noticed this thing; they paid no attention to it. Didn't make any impression. It had long been forgotten. But the Germans bought up some of the patents, and filed them away for possible future use. They could see a need for this. Well, when World War II broke out, the boss resurrected the thing and equipped it with heat sensing seekers and it was responsive to heat; you could fire it in England and it would go straight to a steel mill in Germany or any place that was putting out infrared heat waves. They, they offered it to the military, but they were rather obsessed with the idea of big bombers and heavy bombers and they wanted, didn't pay any attention to it. But the Germans built it. They built the V-1. And it was identical with this device with the exception of the engine. They copied it identically right down to the very last detail with the exception of the engine. They put a different engine on it. And it was the V-1 that almost knocked England out of the war. And if it hadn't been for old Winston Churchill and his courage to put into the air on one particular day in September everything that would fly, England would have been conquered and it would have been the V-1 which had done it. Now you see the irony of the situation, don't you? The thing that had been

developed to originally give the Germans a hard time, was used by the Germans to give the English a ahrd time.

SB Did the V-1's have, did they still use the wings?

JW Oh, yes.

SB The whole thing...

JW The whole thing with the exception of the engine. Of course, along toward the end, they had made considerable improvement on them and had made them much bigger than they originally were. But they were an identical copy with the exception of the engine. That was the...

SB How much explosives did, did they carry?

JW You mean the V-1's?

SB Well, no, the one that you worked on?

JW Two hundred pounds.

SB Two hundred pounds, that, that would blow up a house.

JW That would blow up a good many houses.

SB I guess so. Do you think that Mr. Wright or Mr. Kettering, particularly Mr. Wright, as a minister's son, or a bishops's son, had any compunctions about developing these war machines?

JW He didn't particularly like it. He told me one time that he never imagined that it would be used that way. Yet, practically the first one he sold was sold to the United States Army.

SB Yes, do you think he thought that they would, do you think he foresaw, originally, the, I think they had an idea they'd use them for observation planes, but do you think that he had the foresight to see that they, that they eventually would be used for war?

JW I do not think that he had any intention of that at all. I think he

envisioned a peaceful transportation. And he's remarked to me a number of times that he had no idea that it would become a weapon of death.

SB Did any one else work with him in his laboratory or did he just work by himself?

JW Oh, he just worked by himself, and some of us would give him a hand now and then to do some little job, that he wanted done. Mostly he and his secretary were there.

SB Who was his secretary at that time?

JW Well, you mentioned her name the other...

SB Oh, Miss, Miss Alice Hall?

JW Yes.

SB Mr. Connover mentioned a Mrs. Beck, does that ring any bells with you?

JW I believe she did work for him at one time, but I didn't know either one of them, only just passing them in and out of the laboratory, say "Good-Morning", something of that kind.

SB Did you ever see him mad?

JW No, I never did. I never saw him angry at all.

SB He seemed to, to have more or less treated everyone alike, whether they were, they had come from England or Germany to see him or it was someone whom he knew.

JW That's quite true, that's quite true, After the Smithsonian was there, I think that hurt him very, very badly. He seemed to me to be more reticent to be more reserved and to be less inclined to talk to people than he did before.

SB Well, how did that, how did that start? Would you tell us about that, please?

JW Well, I never saw any official documents. I only know what Mr. Wright

told me and what I have heard from other people. But if you will recall, Samuel P. Langley was working on a flying machine at the same time the Wright Brothers were. And this device was somewhat different. It was powered by a small steam engine that was not of sufficient power to lift it off the ground. And it had no provision for lateral control. It was launched off a dock on the Potomac River, I think it was in September of 1903, or anyway a few monthes before the Wrights made their flight. Well, it flew like a chunk of lead, right straight to the bottom of the Potomac River. And the Smithsonian fished it out of the river, and when the Wright brothers made their flights, the Smithsonian patched this thing up and put it on exhibition as the first heavier than air flying machine. Well, not much was said about it, some people disputed it, but along about 1918, when just after the war, when the airplane business was pretty good. Everybody was paying the Wrights the royalty on the planes that they manufactured under the Wright patent which covered the lateral control mechanism. Then Curtiss decided that the royalty thing was a little too much, and complained about them. Then he went to the Smithsonian and with the proposition that he would take the original Langley machine. He took it to Hammondsport, New York to his factory and reworked it. Put in a gasoline engine of considerably greater power than it was originally, he put on the same type of lateral controls that the Wright brothers used, and he strengthened up the frame in various parts where it was weak. If I recall, it was in the winter time. He took it out on the lake there at Hammondsport and wound it up to try to fly it. He run it up and down the lake and he never got into the air. But photographers were along, among them some of the Smithsonian men, and every once in a while this thing would hit a bump in the ice and bounce up like an

automobile does. Several of those photographers got pictures of it with all wheels off the ground. Well, Curtiss then filed suit against the Wrights, claiming that the Wright patents were invalid because they were not the original inventors of the plane, that Langley was the original inventor and offered as evidence these photographs of the Langley machine clearing the ground. So, in order to combat this suit, the lawyers wanted some information. Orville had the original B-2, the one that he had submitted to the army on the first contract and that he flew at Ft. Myers, Virginia, for little over an hour. He had that thing in storage down at the field, and he got it out, Howard Rinehart made a number of flights in it, and we got the information we wanted. When the suit came to trial, the courts held that the patent was valid on all counts, and that the Curtiss plane was invalid. In the mean time, the Smithsonian had published a report in which they showed the same pictures and which if they did not state explicitly so, at least by implication, advanced the claim that Langley was the original inventor of the plane. They put a ticket on the Langley plane, calling it the first successful heavier-than-air aircraft. And there the matter stood for some years, until quite a few people began to ask Mr. Wright why he didn't put the Kitty Hawk in some museum. It was then stored, part of it, at the laboratory and part elsewhere. And he told them that there was only one place in the United States where it was suitable to put it, and that was the Smithsonian, but he was not going to put it in the Smithsonian until they changed the label on the Langley machine, And until they corrected the statements they had made in the Abbot report. Well, the pressure was brought to bear on the Smithsonian, and finally they agreed to change the label on the Langley machine to the first heavier-than-air machine capable

of flying. Well, that wasn't satisfactory to Mr. Wright. He would have gone with it, but they refused to make any correction on any publication that the Smithsonian had ever issued previously because the Smithsonian was infallible. It was an arm of the United States government. It never made any statements that wasn't so, and it wasn't going to destroy its image with the world by admitting that it had made a mistake. And that was that. So eventually Mr. Wright gathered up the Kitty Hawk plane and sent it to England to the Science Museum at Kensington, England. And I am sure that that affair hurt him, most deeply. He sent it to England with the revision that he could recall it at any time after a certain number of years, and shortly before his death, prevailed upon by some of his friends, Mr. Kettering among them, he wrote a letter to recall the plane, and after his death, it was brought back, I have not been in the museum since the Kitty Hawk plane was displayed there. I do not know exactly what labels are on it. I have never seen a correction by the Smithsonian of the Abbot report, but I'm sure that Mr. Wright always felt that the Smithsonian by chicanery and trickery had tried to take from him the credit that was due him, and bestowed upon a former director of the Smithsonian to which it wasn't due.

SB Did he ever speak of Mr. Chanute?

JW Oh, yes.

SB Was, was he still living at that time?

JW I don't think so. Yes, I believe he was, I'm not sure, but he spoke of him very ofren.

SB Did he, get along with the Army brass? His first relations with the army were not too happy.

JW I...

SB Did he ever express his opinion of the...

JW He was not one to express his opinion. He kept those things to himself, quite, quite well.

SB He was not what you call a talker.

JW No, only to those who he knew and trusted.

SB Did you feel that this was because of the, of the way the press had treated him, or...

JW I got that distinct impression. The press and the Smithsonian affair, together, I know that very definitely that he was much more reserved than he had been. He was much less inclined to give any confidences of any kind to anyone that he didn't know very well.

SB Who did he know? What, what were the circle of people around him?

JW Well, Mr. Kettering was one who was a real good friend. Mr. Deeds was another, I think Harry Williams was one.

SB Now who was Mr. Williams?

JW Oh, he was the architect that built his house. He's been dead these many years. But outside of that and his sister, his housekeeper, I doubt if there was anybody that can be said he was a real close friend.

SB Did these people, did people call him Orville or did they call him Mr. Wright?

JW Well, it all depended on who it was. Boss Kett called him Orville. But most other people called him Mr. Wright.

SB Was that in deference to his position, or was he the type of person, that you don't call.

JW He was the type of person whom you would naturally address that way.

SB But he had, you said a warm relationship with his sister.

JW Oh, yes, very warm.

SB Yes, did she have an interest in flying also?

JW Yes, she did. She sewed many a mile of airplane cloth for him.

SB Oh, is that so?

JW And Mr. Wright was just about as good a seamstress as she was. He could operate a sewing machine like nobody's business.

SB Is that so? Cloth, was it a heavy canvas?

JW Oh, no, it's a linen cloth, it was very fine linen cloth. You see, you put it on the wings, and pull it tight, and then you varnished it with a varnish that caused the cloth to shrink, and it come just as tight as a drum head.

SB After 1917, did he do any work for the Army or for the government, or any private companies, do you remember?

JW I wouldn't know. I have no way of knowing.

SB After this association with him, then you didn't, you'd only see him at the Engineers' Club?

JW I'd see him at scientific meetings here and there and at the Engineers' Club, quite frequently. And I would stop by every once in a while, if I happened to be in that end of town. And chat with him a little bit. And I happened to be on the board of directors of the Engineers' Club.

SB (break in tape)

(end of side two)

(start of side three)

JW Where the smallest part and then it flared out at each end to maybe three and a half to four feet. It was a very beautiful piece of woodworking. It was made of mahogany, polished till it looked just like rosewood; it was very beautiful. The interior was very, very highly polished. It had to be because it would otherwise distort the airflow through it.

SB This was the wind tunnel in his laboratory. What, what else did he have in his laboratory?

JW Well, he had another wind tunnel of different size; it was smaller. And of the earlier date. And outside of a few instruments, that's about all.

SB Well, what instruments were there?

JW Oh, pressure gauges and things of that kind. And tools and there wasn't too much else. He had stored in there parts of planes of different kinds. One time he had part of the Kitty Hawk plane in there and whatever happened to interest him at that particular time. He worked on. The front part of the building was in offices. There was about four offices. He had one and his secretary had one. Then there were a couple of others, in which he kept his records, and whatever he happened to want to keep.

SB And then the back would be just the storage, and things like that. I noticed in most of the early letters it looked like he himself wrote them. That he didn't even have a secretary.

JW Very probably he didn't.

SB Well, I think that, can you help me with the mike, any other, our next, I'm sorry, any other thing we can question this gentleman on?

Mike I'd like to know what you know about Mr. Kettering? If you're finished with the Wrights. Can you tell us how you first met Mr. Kettering?

JW Well, I first met him, when I went to work for him in 1917, April of 1917.

Mike Where? At Delco?

JW Yes. He was an individual of which the mold was broken when he was born. There was never another one like him. He was a scientist, he was a philosopher, he was a musician, he was anything that he chose to be. He had the remarkable faculty of being able to complete the change of personality as he went from group to group. If he was in the shop, talking to people in the shop he used their language, and chewed their chewing tobacco and

did stuff like they did. He would walk across the street and address a group of doctors, say, and he would become a doctor. He would use their language, use their mannerisms, he'd speak as they would speak, and in a manner that they would understand. He'd go on across the street to a bankers' convention and he'd be a banker.

Mike Did you work with him very close, at Delco, at Delco?

JW Yes, very close.

SB I can't help but ask this. But compared to Mr. Wright, of the two men, Mr. Wright seemed to have been the same to all people, and you say Mr. Kettering had a whole different type of personality. Did people like Mr. Wright when they worked for him?

JW As far as I know they did. I never worked for him. He was not my superior. I worked for Mr. Kettering. But I was in and out of the place. And an awful lot. And he supervised and assisted and helped in a the work I was doing. I never found him other than courteous, kind, helpful at all times.

SB Now, you're a chemist now. At this, when you were working for Delco, were you a chemist?

JW No, I got into chemistry by accident. While we were working on the Bug job, the Boss came in one day and he said, these Germans are getting up and behind our boys in the air and shooting them down. So they got more power and better planes than we've got. And he said we've got to do something about it. I had worked on the old Liberty motor and built some of the ignition parts for that, some of the ignition apparatus. He says, Now we can make that thing put out a lot more power, if we can just find the gasoline that will make no knock. He says, I want you and Lidy, find out some kind of a gasoline that will, we can use in that motor and we

make a car out of it. So I had to learn chemistry real quick.

SB A no-knock gasoline.

JW No-knock gasoline.

Mike How did you come upon using tetraethyl lead?

JW Now, that's, that's a story that's rather interesting. We were, running this gasoline in the old one-cylinder Delco light engines, we had four pilots, and we got so we could tell by, from what part of the country gasoline come from, whether it was from Ohio, or if it come from Pennsylvania, this come from California and so on. And Mr. Midgley got an idea in his head what was causing the knock was heat rays from the frame front covering across the cylinder would ignite spots ahead of the flame front just like rams in front of a prairie fire. You, I don't know whether you have ever seen one or not, but the fire burns along in the burning a debris that will spiral up carried by the wind, and drop ahead of the flame and start a little fire ahead of them. And that was his theory. He says, Now if we put some dye in that gasoline that isn't red, he says, where it will cut off those heat rays, and stop it. And he says, go upstairs and get some dye, and we'll try it. We had to set it up; we had two fuel tanks on each one, little glass cylinders that we could kinda stop, that we could run it from either one. To the other. So I went up to the lab to Harry Piaget, and asked him for some dye. He says what do you want dye for? Well, to put it in gasoline. He says, I haven't got any dye for gasoline. And he reached up on the shelf, and got a bottle of iodine, and he says, use this. He said, that will dissolve in gasoline, and I, it's purple and it isn't red and you can make it any color you want by how much you put in, so back down stairs. And we doctored up the can of gasoline with the iodine, and no-knock, and did what we could and went out. We filled up their engine

in ordinary gasoline in this tube, dyed gasoline in this tube, turned the cock and it would run beautiful, turn it to the undyed gasoline, and the thing would about jump off the floor. Turn it and it would run beautifully. Boss come in and he says, how you getting along? Well, we've got this thing licked, its very simple, just dye the gasoline. That's all we showed him. He was well, very much impressed, he says, what did you dye it with. He says, iodine, He says, you ain't going to dye gasoline with iodine, and sell it to the public,are you? Well, no we're not going, well we just wait and use it till we get some regular dye from the supply house. Well, he says, when it comes in Friday, let me know. He walked out. Well, we got our dyes in, we had dyes of all colors of the rainbow. And it made no difference what color we put in, because the thing didn't work. It knocked just as bad. We felt it was the fact that it was the chemical compound iodine that was doing the trick and not the color. From which then we deduced that the rest of the halogens should do the same thing. Well, the rest of the halogens did just exactly that. It worked there without a break. Which we didn't expect. And then we tried various other compounds, and we found out that not only did the halogen have an effect, but whatever it was combined with had an effect, and that of many compounds available there were eleven compounds that seemed to be more effective. Then we sat down and through a long series of calculations and much tobacco burning, we come up with the conclusion that the compound lead tetraethyl would be the most effective compound that we could use. Only trouble is there wasn't no such. So we had to make it. And we made it. And I suppose there have been several hundred million dollars spent on fuel additives since, but they have never found one more effective than tetraethyl lead.

SB And that was all developed here? To make a better plane?

Mike Wasn't ethyl gasoline withdrawn from the market at one time, because there was some sort of scare about combustion?

JW It was not withdrawn, it was limited in distribution, but was not withdrawn.

SB They would poison you, the fumes?

Mike Yes, I think so many carbons.

JW That's what somebody thought. That was proved not to be the case.

Mike How was Mr. Kettering as as employer. How was he to work with?

JW Very good. He was one who knew just exactly what he wanted, and he expected to get just that. He could chew you out in the most gentile way that is possible to imagine. He didn't expect more of you than he knew you were capable of, but he expected all of the work capable. I might illustrate that what happened to a young man who came to work for us when we were working on the Bug job. The Boss thought we could use a mathematician, why I don't know, but he thought we could. So he goes up to Ohio State and gets a young fellow that's just graduated with a PhD in Mathematics. And that was a rare animal in those days. Somebody with a PhD in Mathematics quite rare. He brought him down to the laboratory and told us that any of us needed computations, out of the ordinary, we were expected to do what we knew how to do, but out of the ordinary Doc, would help us. We called him Doc because he was a Docotr of Philosophy. So one day, the boss came in with a little piece in his hand, a little part, part of one of the gyroscopes, for the Bug job. He wanted to know what unit of metal was in this particular piece because things was getting kind of short and we had to make some kind of decisions and we had to know how big of a melting pot we was going to have to have to produce these parts.

He gave it to Doc, and he says find out how much volume of metal is in this, and fast. And Doc gets out his pad and his book of logarithms and what have you and sits down and starts calculation. The stack of papers grew and grew. A couple of days later, the Boss comes back and he says, Well Doc, how much metal is in that part? Doc says, I'm just about half through figuring it, and it will take me a couple of days now and I'll have it all calculated out. The Boss says, calculate. He says, why don't you take that thing out in the laboratory and drop it in a graduated cylinder half full of water and see how much the water comes up in the cylinder. Doc says, if you think I'm going to spend seven years getting a PhD in Mathematics and then go measure a piece, why you're all wrong. Well, then the Boss started to cuss and he cussed for twenty minutes and never repeated himself, and at the end of that time, Doc no longer worked for us. Now that illustrates very clearly what I mean when I say he expected a person to use his capabilities to the limit, but he didn't overexpect.

SB That's a good story.

JW Yes, that actually happened.

SB Well, I don't doubt that.

Mike Did you see Mr. Kettering very much after he built the Bug?

JW No, I didn't, went to go to Detroit or join the General Motors research up there, and so I left the employment of General Motors and went elsewhere.

Mike Was he a rather frequent visitor of the Engineers Club downtown?

JW Oh, yes. See, he and Mr. Deeds gave them that building.

SB They did?

JW Oh, yes, they donated that building. He was there frequently.

Mike Did you know the family very well, his wife and their children?

JW I knew Gene, I didn't know the rest of them. I knew Mrs. Kettering quite well.

Mike What type of influence did she have upon him?

JW I don't think anybody could have any influence on the boss. He was as he was.

Mike How would you summarize his characteristics?

JW I would summarize him as being a man with wide knowledge, and much wisdom. I say that because in any field of knowldege he had a great amount. He knew something about everything. And he had the wisdom to use that knowledge as it should be used.

Mike Have you got any more questions?

SB I guess not. Thank-you very much. You've helped a lot.

(end of tape)

INDEX

(? Ralph D. Palmer)