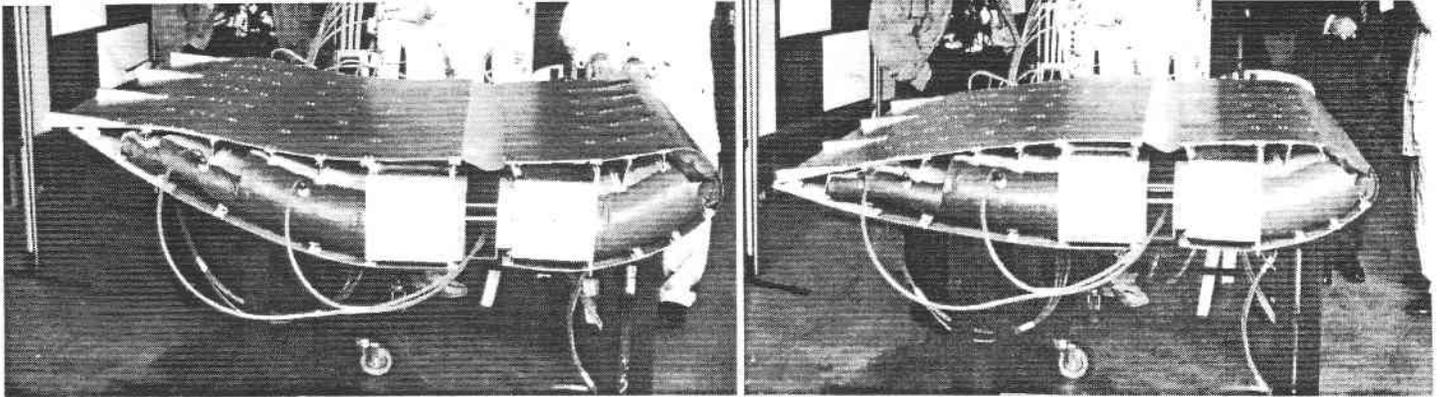


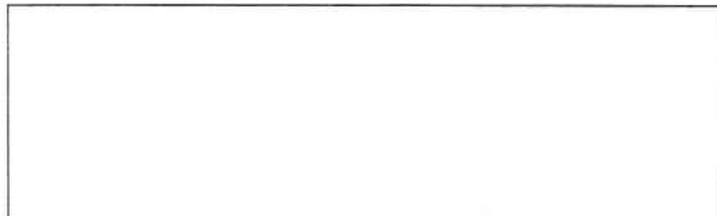
T.W.I.T.T. NEWSLETTER



We received these last month from Peter Selinger along with his information on inflatable wings. There was not very much that accompanied these, but it is obvious they are a proof of concept section for a flexible wing showing the different configurations achievable through manipulation of the mechanisms. The mechanics look complicated and probably heavy, but that is to be expected in a POC trial run.

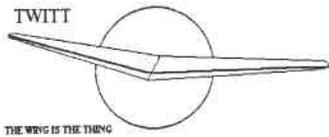
T.W.I.T.T.

The Wing Is The Thing
P.O. Box 20430
El Cajon, CA 92021



The number to the right of your name indicates the last issue of your current subscription, e.g., 9904 means this is your last issue unless renewed.

Next TWITT meeting: Saturday, May 15, 1999, beginning at 1:30 pm at hanger A-4, Gillespie Field, El Cajon, CA (first hanger row on Joe Crosson Drive - Southeast side of Gillespie).



**THE WING IS
THE THING
(T.W.I.T.T.)**

T.W.I.T.T. is a non-profit organization whose membership seeks to promote the research and development of flying wings and other tailless aircraft by providing a forum for the exchange of ideas and experiences on an international basis. T.W.I.T.T. is affiliated with The Hunsaker Foundation which is dedicated to furthering education and research in a variety of disciplines.

T.W.I.T.T. Officers:

- President: Andy Kecskes** (619) 589-1898
- Vice Pres:**
- Secretary: Phillip Burgers** (619) 279-7901
- Treasurer: Bob Fronius** (619) 224-1497
- Editor: Andy Kecskes**

The T.W.I.T.T. office is located at:
Hanger A-4, Gillespie Field, El Cajon, California.
Mailing address: P.O. Box 20430
El Cajon, CA 92021

(619) 596-2518 (10am-5:30pm, PST)
(619) 224-1497 (after 7pm, PST)
E-Mail: twitt@home.com
Internet: www.members.home.net/twitt

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Meetings are held on the third Saturday of every other month (beginning with January), at 1:30 PM, at Hanger A-4, Gillespie Field, El Cajon, California (first row of hangers on the south end of Joe Crosson Drive, east side of Gillespie).

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PRESIDENT'S CORNER

This month's newsletter is the first time I have inserted pictures taken during the meeting with a digital camera. Unfortunately, they are just a little on the dark side, but I will be experimenting more over the next month or so to make them better for the May meeting

I have been asked to make a plea to Robert Marriott, if he sees this newsletter, to please get a hold of Phil Barnes through his e-mail address of: pelicanag@aol.com. Robert is not a member but I have seen his name before so have a feeling he sees the newsletter through another member. If this is the case, please forward this message to him. Thanks.

Although I haven't had much time lately to work on the TWITT web site, I plan on getting started again in the next week or so. What I need from our members is more pictures of their favorite projects, historical pictures that haven't been seen in some other public forum, or drawings of flying wings they may have run across in their readings. If you have any of these things, please send them to me by mail or e-mail them through an attachment (don't imbed them in the message itself). If you send pictures you need back let me know. I will be scanning them for insertion into the web pages so I can return them to you unharmed.

If you weren't at the March meeting, you missed a real treat as Phillip showed the similarities and differences between birds and flying wings. I can write the words he said, but there is no way I can include the humor and quick little sidebars he throws in as he goes along. He said his presentation would only last 20 minutes, but I had to transcribe over an hours worth of material, so you can see it was well received by the members present.



**MAY 15, 1999
PROGRAM**

As of press time we had not been able to confirm a program for May, but we are working diligently to put one together that we know you will enjoy. Make sure to check this section next month for what we came up with.

As I have mentioned in the past, if you know of someone who could put on a program related to flying wings or a closely related subject, please give us a call. We can use all the help we can get, since Bob has just about called in all the favors he ever had with his friends and acquaintances. We could use some programs on construction of any part of a wing, such as, control surfaces or mechanisms, high strength, low weight spars, etc. These don't take someone who is a flying wing expert, but knows how to build aircraft structures. Anyway, we could sure use your help.



**MINUTES OF THE
MARCH 20, 1999
MEETING**

Andy opened the meeting by welcoming everyone to a pleasant day for being closed in a hanger, not too hot or cold. He covered the usual housekeeping items of beverages, magazines and toiletries. Since no one had anything to bring before the group, Andy asked everyone to introduce themselves and we found there were a number of new and legendary people in the audience, including Phil's guest Pazmany.

Andy mentioned to the group that Serge Krauss had sent TWITT a copy of his bibliography's most recent edition-1f. This has been much improved since the last edition with many more references and cross references and is now laser printed for ease in reading all this fantastic information. He mentioned that if anyone had one of the older versions, this would be a good time to upgrade it with edition-1f, since it had to be the most definitive work on tailless aircraft in existence today (in his humble opinion) (ed. - I agree with his opinion and so have many others over the years). For those of you interested, see the ad in the back of the newsletter.

Bernie Gross donated an article on airfoils for flying wings which was directed more towards model aircraft (we may already have a copy, but would add this to the library just in case). He also donated an old copy of a blueprint type image of the Fauvel that is mostly seen in the magazines and stories. This also will be added to the library. Thank you very much, Bernie, for these items. Also, congratulations go out to Bernie and his new bride Helga.

Andy also thanked Pat Oliver for donating one of his blimp kits for a raffle prize. Pat has sold over 100 of these kits designed to teach young students about aerodynamics, construction and the laws of motion.

Bruce Carmichael brought along a short video prepared by a group of German students who had analyzed the flight of albatrosses and then described it through very good computer graphics. The video started with a cylinder and gradually transformed into an albatross running across the ground and finally getting into the air. The long ground run was apparently due to the high wing loading because of the bird's size and weight. The flowing graphics went on to show how they use the natural winds of the southern latitudes to perform a series of climbs into the wind and dives downwind to effortlessly cruise for hours without flapping their wings. Bruce had even heard that they sleep while performing this routine. He also commented that in the future it may be possible for micro-light aircraft to do the same type of maneuvers and soar for long periods of time without thermals or slope lift. All of this provided an excellent transition into our speakers material.

With all of that out of the way, Andy introduced **Dr. Phillip Burgers**, TWITT's Secretary, whose presentation today would cover the issues we have learned from flying wings and apply them to birds.



Phil began by telling us he had some good news and bad news. The bad news was that he would be telling us who he is and what he has been up to for the past several years. And the good news was that the presentation would probably be shorter than the introduction. *(ed. - this did not turn out to be the case.)*

Three years ago he decided he needed to contribute something to the science of flight. To do this he elected to study the flight of birds and then translate what he found, if anything, to airplanes. This led to beginning a study of birds, but before getting into how they fly he thought he should determine where flight originated.

What he found were two opposing theories, one which said birds started from the trees down (arboreal), and the other postulated it was from the ground up (cursorial).

Although he would side with the overall nature of the cursorial theory, he found he didn't like either one, so about two years ago he came up with a new theory on how feathered wing animals became airborne from the ground up. He contacted the American Museum of Natural History and gave them a presentation. This resulted in them giving him a grant to continue his research.

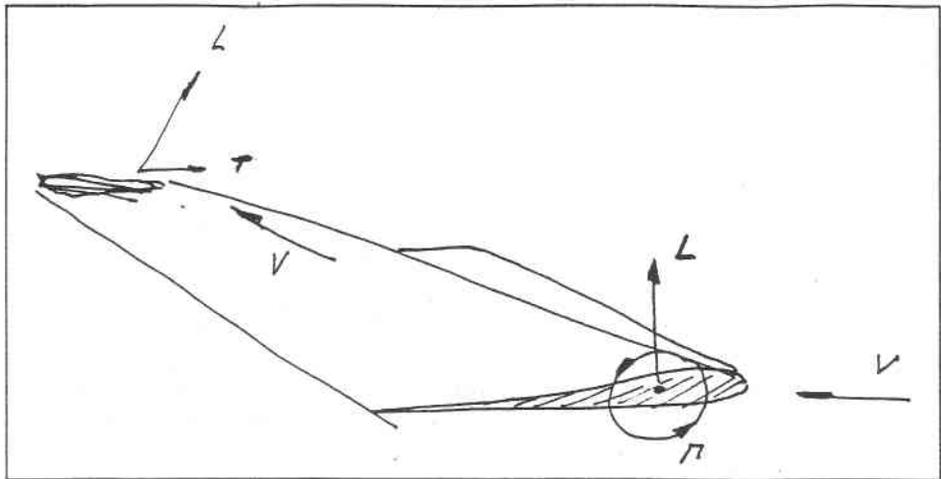
They liked it so much he was asked to submit an article to Nature magazine on this theory which he did with co-author Dr. Louis Chiappe. It turns out their ideas are so controversial that the magazine's editors have spent over nine months trying to decide on whether or not to publish it. Three out of three distinguished reviewers have said it should be published, and Phil thinks it will be in the magazine in the near future.

As the word leaked out that Phil had come up with this new theory, he was honored with a request to give a presentation at a Yale University symposium in mid-February. So there he was, in front of 400 paleontologists talking about adverse pressure gradients. Although they didn't understand a thing he was saying, the public did applaud when he was finished, but he is still not sure why!. He managed to return to TWITT and let us know about these pressure gradient things and how they relate to his love of airplanes.



ABOVE: A not so good shot (give me a break guys) of part of the crowd listening intently to Phil's theories.

Today's program was going to take a non-traditional approach to this subject by looking at how the fluid dynamic flowfield surrounding flying wings and relate them back to what may be controversial findings about bird flight. He started with an old picture of a biplane standing about to crash on its nose in the dirt. This was meant to illustrate

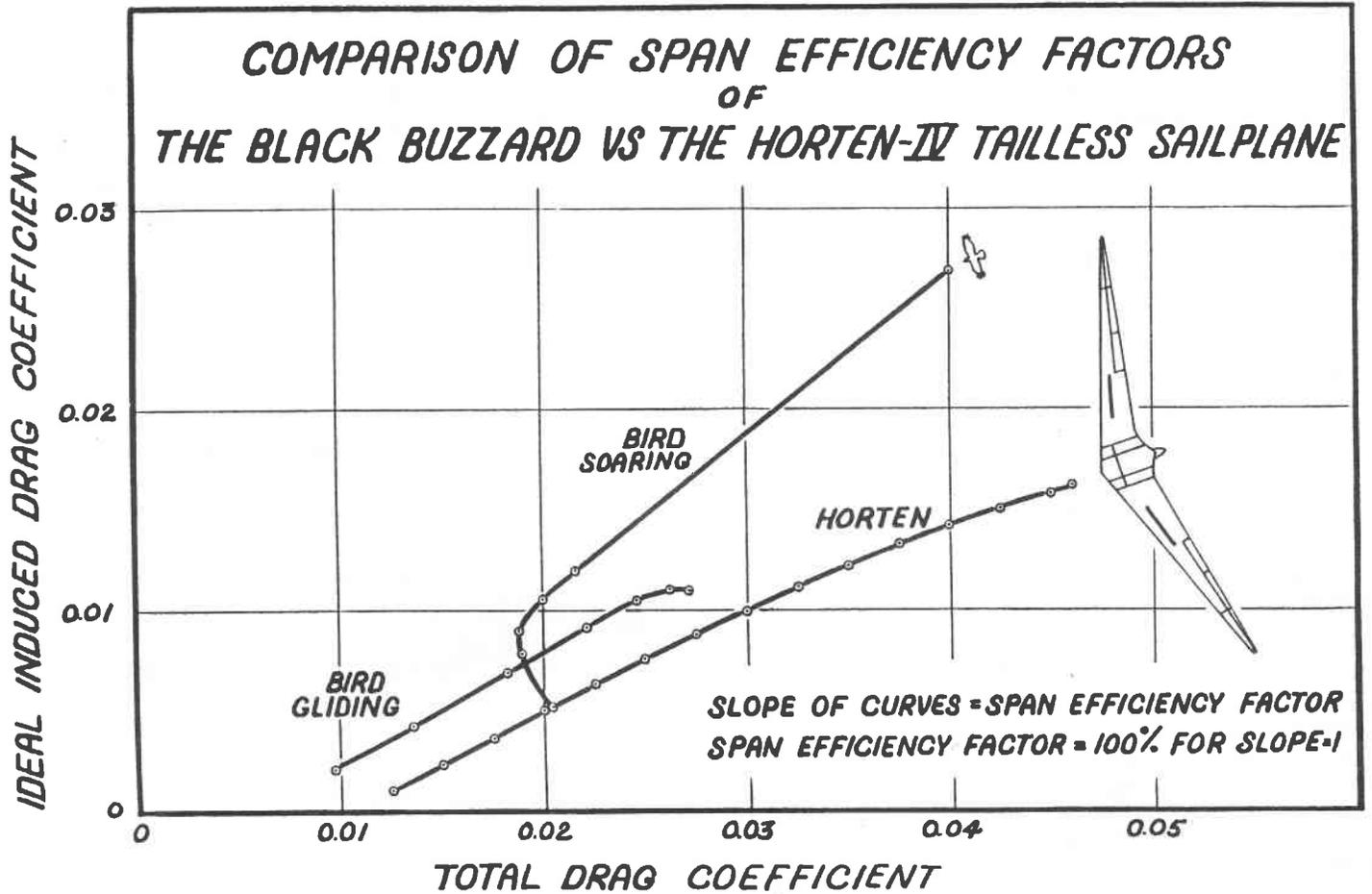


that you can't always believe what you see and that everything needs to be confirmed as fact before moving along to the next research step.

One of the first wings Phil showed us was Hernan Posnansky's 1986 sketch of his idea for a flying wing that helped launch TWITT. He noted how the aerodynamic center of a swinging wing changed in relation to a fixed center of gravity by having variable sweep in flight, and how birds that have read of Posnansky's article in TWITT have better performance.

The next comparison was from the work of Raspert showing some performance figures for gliding of a Horten IV and a black buzzard (see top of next page). He moved on to Reimar Horten's Piernifero, one of his most picturesque flying wings, which Phil was able to locate in Argentina in 1984 during one of his visits. He actually dressed himself with the aircraft and found that it was very heavy. However, as you began running with it at low angles of attack all of a sudden the weight seemed to disappear. This presented the question of why Horten wings are so interesting while at the same time giving us an opportunity to study them in order to try and find something related to birds.

Horten wings have sweep and a tremendous amount of washout or twist. This can reach nearly 15 degrees when you add together the aerodynamic and geometric twist values, but results in good stability and no stalling at the tips. Horten commented that he had shown he could get thrust from the tips at very high lift coefficients, however, Phil noted he has never seen anything in writing on this. The next slide was a rough drawing of a wing panel with the lift and thrust vectors shown (see top of this page). The root section shows the velocity vector coming in from the front and the lift vector perpendicular to it, but due to circulation you get an induced velocity at the AC flowing towards the tip. At the tip it becomes a very powerful upwash depending on how much the lift is, and this upwash tilts the lift vector forward yielding thrust. This offsets the tremendous amount of induced drag from the large amount of twist. This is something you don't ordinarily find on other aircraft, so that is why Phil used the Horten designs for this study.



Now that we were talking about thrust, the next logical step is to determine how birds produce thrust so we can continue with the basic theme of this presentation. Where the Horten gets thrust from sweep and upwash, the bird gets thrust from the upwash produced during the downward flapping motion. At very low speeds there is lots of upwash from the flapping, but as the bird begins running for takeoff the amount of upwash is decreased. However, the large amount of upwash is also producing large amounts of thrust. He related this back to the video of the albatross trying to take off from the water. The wing flapping was producing lots of thrust but very little lift during the initial stages of the takeoff run, which probably accounts for some of the awkward things we see these birds do in films shown periodically by the various nature programs on television.

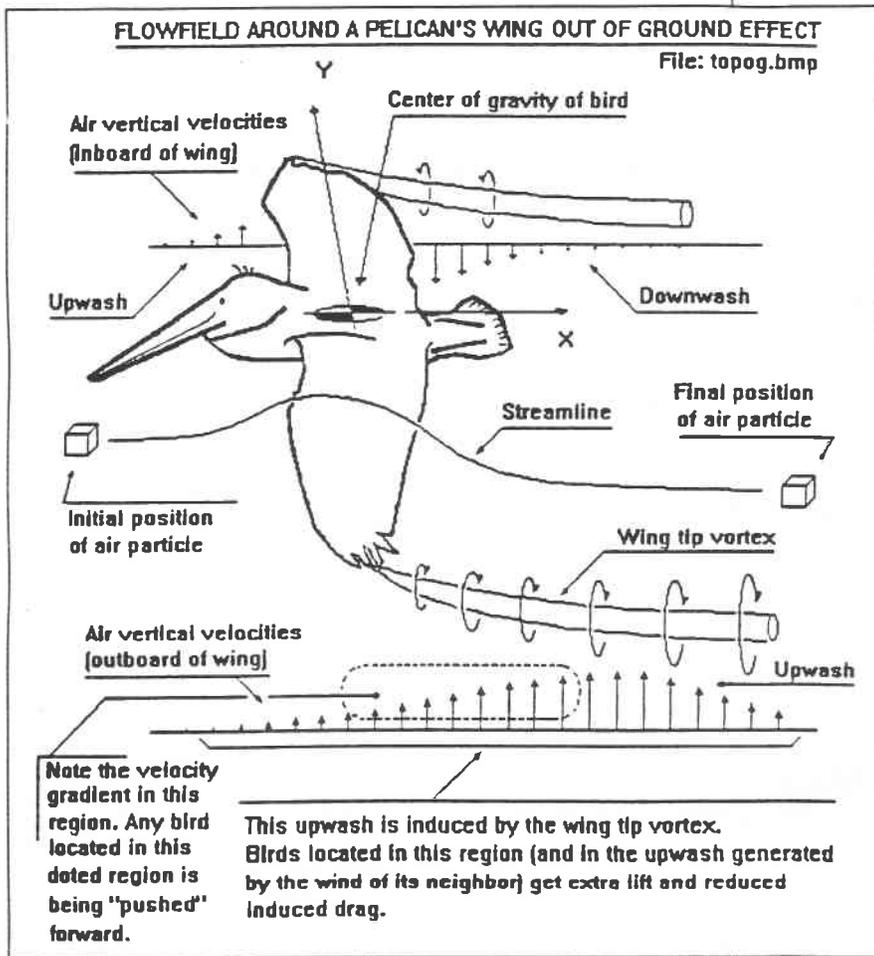
This brings up the question of how does the bird achieve what Phil calls the "afterburner effect" in order to bring more thrust into the picture. But first Phil talked about what happens around a lifting surface, in this case the wing of a pelican. His slide shows where the upwash and downwash are occurring in relation to the wing. The next slide showed the mathematical representation of this flow which was rather complex and more than needs to be covered here.

In a new twist on conventional thinking, it is Phil's belief that the bird's strong tendency to fly in formation has more

to do with finding upwash in front of them while flapping in order to increase thrust, not lift. Obviously this is the opposite of traditional thinking that they fly in V-formations to increase lift within the formation or reduce induced drag. He illustrates his point by suggesting you don't see bird formations trying to thermal, since this requires producing lift rather than thrust, besides the fact it would be difficult to accomplish this type of flight pattern. In Phil's opinion formation flying does not contribute a lot to the increase in lift, but for each flapping cycle they are producing much more thrust.

So we have learned that the sweep (although taper contributes substantially) in a Horten wing generates a very large upwash at the tip which generates thrust. A bird flying in formation is looking for the upwash from the other birds around it in order to increase its thrust. This is necessary to be able to accomplish the extremely long migrations during the seasonal changes.

There was one thing Reimar Horten was worried about. He was the first to come up with the discovery of the lift emptiness in the middle of a swept wing, which he called "central effect". Phil showed a slide that were drawings quickly scribbled out by Dr. Horten that explained how he would see an improvement in the aerodynamic conditions at the middle of the flying wing by adding a cusp. This "central effect" increased the local induced drag at the



middle of the flying wing which would now lead Phil back to looking at how this manmade condition relates to bird flight.

One of Horten's solutions at first was not to add the cusp, but to come up with a different configuration. What Phil showed on the screen was a flying wing with a second, smaller flying wing mounted above the leading edge at the fuselage centerline. It was like a canard, but really wasn't one; maybe you could call it a tandem flying wing

Phil took this to the next step by relating that the flow field around something like the Horten wing was very similar to that around a formation of birds (see illustrative example above). The upwash is larger at the tips, so if you are a bird on migration look to be the one at the tip of the formation to take advantage of the greatest amount of upwash and thus the thrust. He also noted that you will never see a formation with a lot of sweep, since the greater the sweep the greater the local induced drag at the middle and this will have a tendency to stabilize the formation. He got these results from a computational fluid dynamic computer program he wrote for his dissertation. He used this program to study the aerodynamics of one bird as the lead and the other bird at 70-80 degrees behind it, but not in the downwash of the lead bird. What the program showed him was the increased induced drag on the lead bird would cause it to slow down and reduce the sweep

angle of this small formation back into the range of 30-40 degrees which is more normal.

At this point Phil sort of moved away from the direct correlation between manmade and natural birds and began to explain a little bit more about his theory of how birds ended up flying. Unfortunately, we cannot discuss a lot of it here since *Nature* magazine currently is reviewing the material. He did give the group a look at his theory through a series of slides and it was very convincing to most of those in the audience. You have already seen some of basics of this theory in the material presented above talking about bird wings producing more thrust during the flapping stages of the take-off run.

Phil opened the floor to questions. Bruce Carmichael asked if Phil had looked at the sum of the drag in a bird formation as more birds joined it. The answer was basically no, since it involved a 3-body analysis which is extremely difficult to do because of all the permutations of the relationships between the bodies. Phil did note he had been able to confirm that two birds in formation was better than one bird alone once they got into the proper relationship with each other.

Ed Lockhart asked if soaring birds use tip washout like the Horten wings. Phil went through a long explanation that seemed to result in not really addressing the question, but did

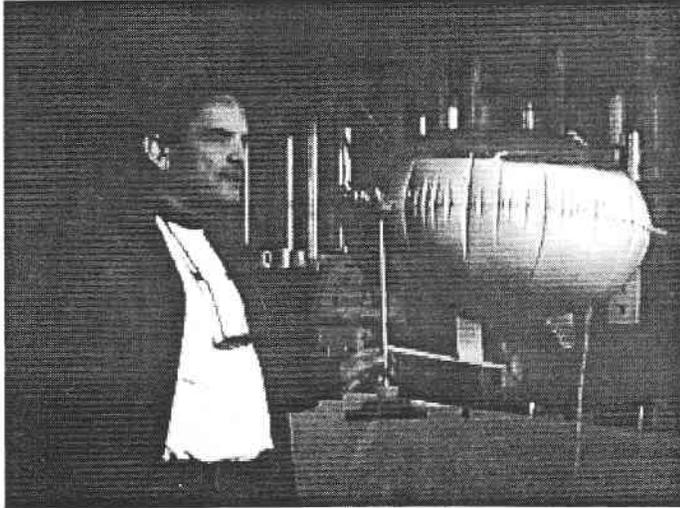
cover some other interesting speculation about the purpose of the "alular" at the mid-point of a bird wing. It was generally agreed that it somehow helps prevent a stall along the wing. Phil indicated he needed to do more research in this area before he could commit to why and how it really works.

There was a general discussion about the use of propellers as a pseudo-parachute and that nature has done very well with this type of device for spreading seeds. However, Phil noted that a parachute acts to create a terminal velocity so you can land safely and that terminal velocity is defined as reaching a point of zero acceleration. This can't occur with a propeller acting as the descent device due to the weight of the body it is trying to offset.

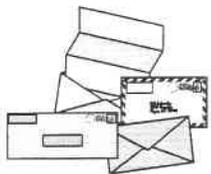
Now the question came up about flying fish and how do they stay in the air. It was commented they use their tail in the water to produce thrust which gives them the forward motion to create the lift. So you can see that the general "thrust" of the meeting was moving more into the realm of natural wings versus manmade flying wings. Part of this was due to audience curiosity and part due to Phil's fascination with bird flight acquired during his doctoral research. The direction this was taking had to lead to the mention of flying squirrels and bats which were a whole 'nther story.

In conclusion, Phil wanted to thank Bruce Carmichael for giving him a large number of books on birds and animal locomotion that aided greatly in his research project.

From the conversations that took place after closing the meeting, it was evident that everyone enjoyed it very much and now have a better appreciation of how birds fly and the real beauty of it.



Andy conducted the raffle, with a indoor, rubber powered blimp, which was donated by Pat Oliver (see above), going to Bernie Gross. Pat Oliver in turn won a set of battery jumper cables, and (ed. - I don't recall right now) won a set of classic American aviation stamps. The meeting was then adjourned for coffee and donuts.



LETTERS TO THE EDITOR

(ed. - In January I published the cover letter from Eric's package he mailed us in September '98. Below are the two appendices he talked about, along with two of the attached pieces that were in English.)

5/8/98

TWITT:

thank you very much for your letter dated April 19th ('98) and all the addresses you gave me in appendix of this letter.

As you have noticed, I am not yet equipped to send e-mail, but the company where I work we are installing Lotus Notes which will give me the possibility to send e-mail very soon. In addition, I hope to have a better computer than my old MacIntosh SE before the end of the year.

Please note here - after some pieces of information with regard to the problem of an address for the Texas Airplane Factory. This company has already built 4 replicas of the Grumman F3F-2 and has built in late 1997 one Messerschmitt Me 262 which was normally to be flown at the end of '97 or early '98. This Me 262 had to be the first of a series of five twin-seated. I give you in appendix a copy of what was published in the French periodical "Le Fana de L'Aviation".

For what concerns the company Monogram (Monogram Aviation Publication), I already found the address and wrote them, but unfortunately, the book "Horten 229" written by Dr. David Myhra in the series Monogram Close-up (Nr. 12) is sold out. Concerning the other book of Myhra (presented in page 2 of the January issue of the newsletter) "The Horten Brothers and Their All-Wing Aircraft", it is available at Zenith Books at a price of \$59.95 (code 126507C). This company is selling everywhere in the world and it could be interesting for foreign members.

For the photo of a flying wing I sent you with my last letter dated January 20th, please note that I received the answer from Mister Rudolf Storck. The aircraft was built by Mister Hermann Köhl and Mister Ernst von Lössl in 1933 at the Weimar Engineer School.

For which concerns the Fauvel aircraft and gliders (AV-60 in the January issue of the newsletter, pages 2 & 11), please note that I am preparing some copies out of the French Periodical "Aviation Magazine". I shall send to you this set as soon as it will be ready. It concerns the Fauvel's as well as other tailless aircraft. I have also a list of flying wing scale models that I can send to you.

I have also seen into the newsletter January issue - page 3 and the February issue - page 7, some notice concerning Mister Stan Hall. I was interested by this because I received some weeks ago from Mister Chris Wills (President of the Vintage Glider Club of U.K.) a copy of a letter which was sent to him by the Soaring Society of America. In this letter is it said that Mister Stan Hall was to be the pilot of the Horten Ho VI V2 for Northrop. I do not know if this is known by the TWITT members? Concerning the book "Horten Tailless Sailplanes" described in the February issue - page 7, do you know where this book is available? By chance, do you know the address of Mister Stan Hall?

In the February issue of the newsletter - page 6, I have seen the reference of a book or a report written by Capt. Eric Brown which is titled is "Wings of the Weird and Wonderful" (Airlife 1983). Do you know where it is available?

I wish you good receipt of this letter and remain,

Yours sincerely,

Eric du Trieu de Terdonck
Belgium

(ed. - The attached picture and caption on the Me 262 showed the Texas Aircraft Factory being located at Meachem Field,

Fort Worth, TX. The picture shows a nearly complete aircraft with what looks like a more modern jet engine being prepared for mounting under the left wing.)

One of the articles he sent contained more information on the picture we included in the February '98 newsletter. To add to what you have already mentioned about the builders, the piece says, "No mention of it appears in Jane's All the World's Aircraft, but the 1932 issue describes and illustrates a tailless monoplane designed by Lippisch and designated by the Greek delta symbol and the numeral 1. It was christened the Hermann Köhl, but was not the aircraft in question."

A second piece included with this letter included a better photo of the aircraft and a 2-view drawing which I have included below.

Here are a couple of excerpts from the Northrop/Horten story:

Letter to Christopher Wills from the SSA dated May 14, 1975, unsigned.

"I called Jack Northrop, now retired and quite old. He protested that his memory no longer served him well. But I took advantage of the call to inquire about the Horten. 'No', he said decisively, 'we never had the Horten in our plant. Of course we followed quite closely what the Hortens were doing, but we never had their aircraft here.' I think he was anxious to make it clear that the fabulous Northrop wing was his own product.

"So I asked Stan (Hall) about the matter. 'His memory is bad,' Stan said. 'We had the VI at the plant and I was to be its pilot. The only information we had was material from the Army which said something about the difficulty of ground handling. The wing was huge! I believe around 75'. When I took the tip and jarred it I could see sine waves (or a sine wave) moving across the span. I decided not to fly it.'"

Letter to Eric from Stan Hall dated June 20, 1998.

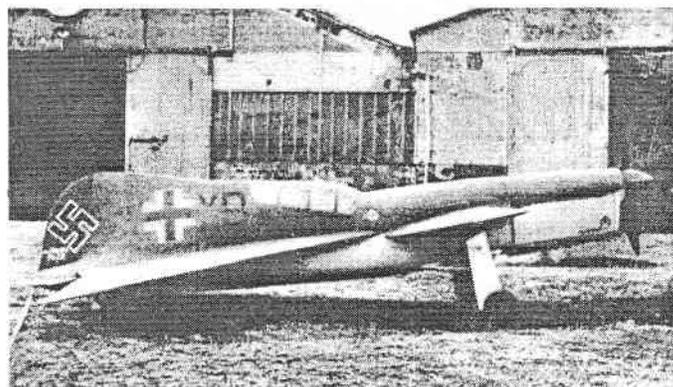
"While my primary interest in the Horten aircraft centered on the Horten VI sailplane I was not the test pilot. I had been slated to fly the machine after Northrop had finished assembling it, but once I saw how extremely flexible the wing was, and after reading what the Germans had to say about it in another document, I declined. I do recall, though, that the Germans considered the aircraft to be 'too unwieldy' on the ground to be of practical use.' It is possible that the aircraft never flew. I don't know whatever happened to the Horten machines, but it occurs to me that you might contact the Northrop Aeronautical Institute in Hawthorne, CA. That's where the German aircraft were delivered and assembled."

May 14, 1998

Dear TWITT:

I have just received the newsletter No. 143 of May 1998. I was surprised to see, page 4, an aircraft, the MB-1 Delta Kitten, which is nearly the copy of the French aircraft PAYEN Pa-49 "Katy" which had made flights in the fifties.

I send you in appendix some copies out of the French periodical "Aviation Magazine" and out of a French encyclopedia "Mach 1" regarding the PAYEN tailless aircraft. The story of the French designer, Mister Roland Payan, is very interesting, because as the Horten's, he never got any serious support from the national authorities and had to mainly do the job himself. He also suffered a lot from WW II, because his Pa-22 (see below) was taken over by the Germans and destroyed during a bomber attack.



In 1945, Mr. Roland Payen designed an interceptor with a delta wing, the Pa-48. Payen could not convince the French authorities that his concept was interesting and the Dassault "Duragan" was the first jet aircraft of the French Air Force. After that, Payen decided to build a reduced model of his interceptor, the Pa-49.

The Payen Pa-49 "Katy" twin-seat aircraft was built out of wood and was planned to be equipped with a jet engine of the type Turboméca Piméné with a thrust of 110 Kgp. The planned characteristics in 1951 were as follows:

-Aspect ratio:	2.7
-Wing span:	5.20 m
-Length:	5.10 m
-Height:	2.20 m
-Weight empty:	220 Kg; loaded; 430 Kg
-Max speed:	315 Km/h
-Landing speed:	55 Km/h
-Max duration of flight:	2 hours

The non-finished aircraft was presented at the 19th Aeronautical Exhibition of Paris in June 1955.

At the end of 1951, the planned jet engine was changed to a Turboméca Palas with post-combustion and a thrust of 160 Kgp. The prototype presented at the exhibition of

June 1951 was not used and a new one was built at the Juvisy factory with the company's own money. Only a wind-tunnel credit was allocated to Payen and the full scale prototype had to be tested in the ONERA wind-tunnel (Chalais-Meudon??). The flight tests were planned for May 1953. The new characteristics were as follows:

- Aspect ratio: 2.7
- Wing span: 5.16 m
- Length: 5.10 m
- Sweep angle: 70°
- Total weight: 460 Kg
- Max planned speed: 500 Km/h
reduced to 400 Km/h later
- Landing speed: 70 Km/h (fixed landing gear)
- Max duration of flight: 1 hours



The ground tests were performed beginning in December 1953, and the maiden flight was done December 16, 1953.

The pilot in charge was Mr. Tony Oschenbein of the 10th Fighter Squadron in Villacoublay. The aircraft was presented to the French authorities on January 22, 1954. This aircraft was the first delta aircraft to fly in France. His actual maximum speed was 360 Km/h.

Some talks with the company Fouga for the development of an advanced training aircraft were held and the Fouga experts performed some flight tests on the Pa-49. All was stopped in 1955, because the company Payen was bankrupt. A new company went up and was installed in Juvisy.

In 1956, some trials in Réau-Villaroche for testing of the "Fléchair" flaps were done. A presentation with the ALAT authorities (military services of the aviation artillery), who were interested in the aircraft for military operations at low altitude, was done. At the same time, the builder was claiming that the brake-flaps of the Convair F-102A & B were of the "Fléchair" concept, which the French state had applied for U.S. patents.

The tests were continued until 1959, with the same pilot, Tony Oschenbein, and another pilot, Vico Rosaspina, and probably also Léon Biancotto. The aircraft was always equipped with a fixed landing gear. It has accumulated 300

flights with a total of 180 flight hours. The aircraft was presented at the Aeronautical Exhibition in Le Bourget near the passenger high speed aircraft "Concorde".

I do not know the fate of this aircraft and where are the archives of the Payen company. Since some months, I am trying to find the Payen Pa-22 archives for Mr. Hans-Peter Dabrowski, but until now without any success.

The test aircraft of Mr. Payen's was the Pa-60 "Arbalété" which was disappointing. The first flights of 1965 showed that the engine was not powerful enough. The project was stopped and Mr. Payen was obliged to do more lucrative jobs in order to survive (for example, building an "Horsa" glider for movies). In 1969, he has modified the Pa-60 with a new 160 hp Lycoming engine and then the results were better. In the seventies, Mr. Payen was still working on this aircraft. I have no idea of what happened after 1969 with

Mr. Payen and his aircraft.

Sources:

1. "Aviation Magazine", Nos. 6 (1950), 29 (7/51)
2. "Aviation Magazine", Nos. 35 (1951), 40 (12/51), 64 (12/52)
3. "Aviation Magazine", Nos. 76 (6.53), 88 (12/53)
4. "MACH-1", Vol. 7,

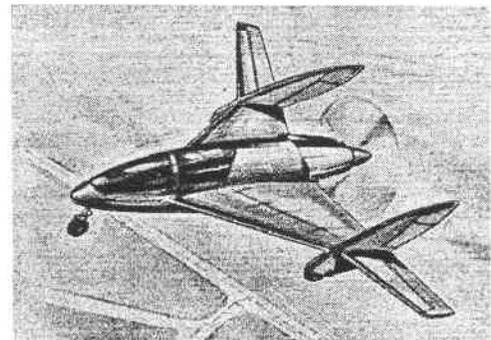
pp. 1865-66.

5. "Aviation Magazine", Nos. 89 (1/54), 91 (1954), 215 (12/56)

6. "Aviation Magazine", Nos. 225 (1957), 229 (6/57), 245 (2/58), 276 (6/59), 312 (12/60)

Mr. Hans-Peter Dabrowski: Payen Pa-22 photos with German markings.

Note: I am not in possession of the "Aviation Magazine" Nos. 100 to 200, so that part of the Pa-49 history could be missing in my archives. Maybe our French members can help for that.



ABOVE: The Pa-60 "Arbalété" as described in article.

I hope that this story can be of interest to the TWITT members and am awaiting their reactions (our French friends, maybe). In the meantime, I remain,

Yours sincerely,

Eric du Trieu de Terdonck

(ed. - I will include several of the pictures you sent along on the floppy disk in the newsletter so everyone doesn't have to look at a back issue to find out what has been talked about for the last couple of pages.

I would like to thank Eric for all the material he has contributed here and in his other letters. It has been quite obvious over the years that the French, and other Europeans, have a unique interest in flying wings and continue to look for new ways to put them into the air.)

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