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National Geographic: Hindenburg

By Unknown

It was the largest and most celebrated
passenger airship ever built.
But like another legendary
transatlantic liner,
the Hindenburg was doomed.
Get this, Scotty!
Get this Scotty!
I looked out the window
and saw the fire,
and my only concern was to get out.
I thought to myself,
"This is the end.
I can't survive the end."
It's a terrific crash,
ladies and gentlemen.
The smoke and the flames
and the plane
is crashing to the ground,
Oh, the humanity.
I guess it looked like hell.
It was like hell on fire.
It was something that will stay with
you for the rest of your life.
Some said it was only
a tragic accident.
Others blamed a murderous act
of sabotage.
But what really destroyed
the Hindenburg?
Now, after more than half a century,
a former NASA engineer
may have uncovered
the real answer to the mystery.
What I found was the fact that
they knew that there was a problem.
It was a problem that would destroy
the Hindenburg
and bring to an abrupt and tragic end
the golden age of passenger airships.
It was, by every account,
simply magnificent-
the largest object that had ever been
lofted into the air.
And wherever it touched down

on its transatlantic crossings,
the Hindenburg was sure
to draw a crowd.
At the Naval Air Station
at Lakehurst, New Jersey,
thousands would stand in line for
hours just to get a closer look.
This was perhaps the most beautiful
flying machine ever built-stately,
streamlined, poised to rule the skies.
Today, Lakehurst is a much
quieter place,
but it's still haunted by echoes
from the airships' glory days.
John Lannacone remembers that time.
He was part of the Hindenburg's
ground crew.
Now he's one of the few visitors to
the giant hangar that once sheltered it.
I was 18 years old when I got here.
And I saw this tremendous
building in there.
I always say it's one of the
biggest buildings in the world.
We put it in a hangar
the first time it came here.
And it just about fit.
The Germans, when they designed it,
it was supposed to be 814 feet long.
Then they realized that this hangar's
only 806 feet long,
so they cut ten feet off.
There was a one-foot clearance
on each end.
It just fit in here
and we closed the doors.
It's sad, I mean,
because it's not being utilized
for what it should be utilized.
I mean, it looks like it's nothing
but a warehouse and junk.
That's what it looks like to me.
Airships have had their place
and their time.

And it's gone.
I don't think airships
will ever come back.
History's first successful manned
flight was in a hot-air balloon
launched by the Montgolfier brothers
into the skies over France in 1783.
But balloons move at the mercy
of the wind,
with no way to control
their direction or speed.
Some dreamed of a method of
directed flight.
The design for these so called
dirigibles were certainly imaginative.
But even the ones that could fly
weren't very practical.
The biggest challenge was
building a dirigible big enough
to carry passengers and cargo.
One of the pioneers was
Count Ferdinand von Zeppelin.
He first encountered manned balloons
in the United States
as a German military observer of the
Civil War and he even flew in one.
Back in Germany,
Zeppelin set to work,
designing a large dirigible
with a rigid framework
covered by a skin of fabric.
It would be lifted not by hot air,
but by hydrogen.
In 1900, his creation would
finally fly.
Within a decade,
there were tourist flights,
and even regular passenger service
between German cities.
Count von Zeppelin was
building the world's first airline.
But airships had other uses
besides carrying passengers.
And with the beginning

of World War One,
airship construction became
a military priority.
Nothing gets developed as fast as
what things do during a war.
Okay, we experience it even today.
So the First World War definitely
saw a dramatic size increase.
The airships went from something like
to two-and-a-half million just within
the span of four years.
The Zeppelins were soon transformed
into weapons of war,
first as observation platforms,
then in a new role:
as the world's first strategic
bomber fleet.
But they demonstrated their
vulnerability as well:
high-flying fighter planes
brought down dozens of Zeppelins
in fiery explosions,
fueled by hydrogen.
In the years after the war,
airship technology would find champions
around the world.
In the U.S., the Navy developed
its own military airships.
The way the Navy used
these big airships
was the way the Germans had used them
in World War I.
And this was to send the airship
itself out to scout.
Well, an airship is an easy thing to
see, and it can easily be shot down.
Partly to protect their airships,
the Navy transformed them into
flying aircraft carriers,
outfitting them with small
fighter-reconnaissance biplanes.
They put a trapeze on the underside
of the airship.
And the airplane would come up

and land on it
by hooking the hook on a bar
at the end of this trapeze,
which would then pull the airplane up
to a hangar inside the ship.
They made the hangar large enough to
accommodate five small fighters.
But there would be problems:
the Navy's American-built airships
were plagued by freakish accidents
and three of them met tragic ends.
The first, the Shenandoah, broke apart
in a thunderstorm and crashed in 1925,
leaving a third of its crew dead,
and its remains scattered across
the Ohio countryside.
In 1932, during a routine
landing of the USS Akron,
three members of her ground crew
were dragged into the air
when the Akron suddenly
lurched upward.
The helpless sailors clung to the line
in desperation until first one,
and then another tumbled hundreds of
feet to their deaths.
The third managed to hang on
for more than an hour
before he was finally hauled on board.
Less than a year later,
the Akron crashed off the New Jersey
coast, killing 73 of her 76 crewmen.
The last big airship that
the U.S. Navy had was the Macon.
It was lost February 12, 1935
in squally weather off
Point Sur, California.
There were 83 on board and,
in this particular accident,
only 2 people were lost in it.
And there it lay, its exact location
unknown for over 50 years.
Finally, in the early 1990s,
an expedition covered by

National Geographic Magazine
found and photographed
the remains of the Macon.
A Navy submersible located the Macon
in nearly 1,500 feet of water.
Her tangled skeleton still harbored
the remains of her fighter planes.
It was a sad reminder
of the Navy's brief,
disastrous flirtation
with rigid airships.
Elsewhere, airships would meet with
greater success.
In Germany, the civilian airship
industry was reborn after the war,
under the leadership of Hugo Eckener,
a charismatic successor to
the late Count von Zeppelin.
Eckener had the experience,
the personality,
and the entrepreneurial spirit
to realize Zeppelin's vision of
a fleet of passenger liners.
He gathered together the best and
brightest engineers and designers
to build the greatest airship yet,
which he named after his mentor.
When the Graf Zeppelin was launched
in 1928,
she was hailed as the most advanced
airship ever.
But Eckener was eager
to build on this success.
So he came up with
an unprecedented scheme:
to fly his creation around the world.
If he could pull it off,
it would be a technological triumph-
and a publicity bonanza.
This is very much like the
Lindbergh flight if you will.
It's one of the big events that people
had been waiting for to happen.
Newspaper publisher

William Randolph Hearst
saw the potential and paid
the Zeppelin Company $100,000
for the rights to cover the flight.
And look at the size of
the Graf Zeppelin,
which looks big even with
Atlantic Ocean under it.
This is first leg of long
globe-circling glide of giant ship,
destined to set a record for
round the world travel.
In August, 1929, with the eyes of the
world focused on the Graf Zeppelin,
Eckener piloted the airship
across continents and oceans,
flying thousands of miles
on each leg of his journey.
Oscar Fink was the helmsman on many of
the Graf Zeppelin's flights.
Well, it really was
a great time then,
an experience that didn't exist
before-riding in an airship.
You would see something of the world-
not like today in an airplane,
which flies at a height of
It was practically a sea ship
in the air.
In the end, the Graf Zeppelin
circled the globe
in less than 300 hours of flying time,
a little more than 12 days.
Her triumphant achievement would
make a lasting impression
on those who saw her.
I remember going up
with my mother and father
to the rooftop of the apartment house-
we lived in New York City,
just to go see the Graf.
The country was seized by
what was called Zeppelin fever.
Hugo Eckener had proven

what airships could do.
When he landed at the Naval Air Station
in Lakehurst, New Jersey,
he received a hero's welcome.
It was an achievement in technology and
it was an adventure that had succeeded.
Eckener was the toast of the town,
treated to a ticker tape parade
along Broadway just as
Charles Lindbergh had been
only two years before.
Eckener was probably the most
recognized face in modern civilization.
He's very much like Neil Armstrong
from that point of view.
He's a world figure of world renown
and if his name comes up
in a conversation,
it's like everybody knows
who you're talking about.
Hugo Eckener and his airship had
captured the world's imagination.
The record-breaking flight was even
commemorated in a children's board game
The Graf Zeppelin soon embarked
on a regular route
between Europe and the Americas.
It was history's first regular
transatlantic airliner.
But back in Germany, a more sinister
figure was rising to prominence.
Adolf Hitler and his Nazi followers
enjoyed growing support.
In a few years, they would transform
Germany and push Europe toward war.
But for now, the head of the
Zeppelin Company enjoyed the freedom
to pursue a new dream:
Hugo Eckener envisioned a new airship
much bigger than
any of its predecessors.
This would be the Hindenburg.
It would feature the latest advances
in engineering

and it would carry 50 passengers
in safety and comfort.
It would truly be a luxury liner
in the sky.
At 804 feet, Hindenburg would
dwarf today's jumbo jets.
It would be almost as long as
the Titanic-
the largest passenger liner
of its day.
Building something this huge and
being certain that it could fly
was an enormous challenge for
Zeppelin's designers and engineers.
As with all dirigibles,
the heart of this leviathan
and the secret of its flight
was its lifting gas.
Along its central axis, enormous gas
cells would rest end to end,
taking up almost its entire volume.
They would be filled with
seven million cubic feet of hydrogen.
A rigid framework would be needed
to support them.
It would have to be strong,
but lightweight.
The material of choice:
an aluminum alloy.
To separate the gas cells:
gigantic O-Rings,
some more than a hundred feet
in diameter,
as big as a carnival ferris wheel.
Now the pieces can be assembled,
in a custom-built construction shed.
After more than three years of work,
the giant airship is beginning
to take shape.
Around the frame: her outer surface
is covered with
painstakingly stitched together.
To protect the cotton cloth from
corrosion by saltwater and wind,

and to reflect the sun's heat, it's
painted with a metallic doping compound.
It's an incendiary mixture,
but it's standard procedure
in airship construction.
Finally, the gas cells can be filled.
Eckener's first choice
is nonflammable helium,
but the Americans have
a monopoly on helium,
and refuse to sell this strategic
resource to a potential enemy.
So he is forced to fill
the Hindenburg with hydrogen.

March 1936:
for her maiden flight.
With her first public appearances,
it was clear that there had never been
anything quite like the Hindenburg.
Streamlined and elegant,
she was a technical marvel and
a masterpiece of design.
As she floated gracefully
off the ground,
Hugo Eckener basked in the glory.
The Nazis would view his new airship
as a stunning symbol of German might.
Though Eckener himself was no friend
of the Nazi government,
one of Hindenburg's first flights
was ordered up by
Propaganda Minister Joseph Goebbels

himself:
an aerial tour of the country's
largest cities.
But the Hindenburg's primary function
was to transport passengers,
and within days of her maiden flight,
she made her debut
in the transatlantic airship service.
One of her crewmen was Werner Franz,
who was hired as a cabin boy.

I was 14 years old the first time
I saw the ship.
When I entered the hangar,
I didn't know where the ship was.
All I could see was a grey wall.
I looked left and right,
until it became clear to me that
I was standing right in front of it.
I saw only a part of the ship.
You had to walk to the front and the
back just to take in the whole thing.
Of course, I walked through every inch
of the ship when I wasn't working.
My favorite spot, when I had the time,
was all the way in the front,
in the bow.
There was a little area with a table
and some small benches and a window
where I could see the whole panorama
in front of me.
That was my favorite spot.
I couldn't pull myself away
from the window.
I was sorry
when I had to do some work.
A cabin boy could appreciate the
thrill of flying on the Hindenburg,
but the best views were
from the passengers' deck,
inside the hull of the airship.
One of the youngest passengers
was Elizabeth Kotter.
I was 11 years old
when I was fortunate enough
to fly to Germany on the Hindenburg.
That was an overwhelming experience,
to enter into this big ship,
and to sail away into the clouds.
It was immense.
It was enormous.
And it was somewhat overwhelming,
especially for a child.
And one would get caught up
in the general euphoria.

Life on board was just like
daily life at home.
Breakfast would be served very nicely,
just like in a big hotel.
The meals were very good, and you would
look forward to what was on the menu.
The Hindenburg's chefs turned out
gourmet meals served on fine china,
and accompanied by
French and German wines.
Alfred Grozinger recalls the time he
spent working in the airship's kitchen.
When I got onto the Hindenburg
I was 19 years old and, as a cook,
I made all the voyages
from the first to the last.
We did our utmost
to make everybody happy.
Whether it was the crew or the
passengers, we did what we could,
and I would contend that
none of the passengers had anything
to complain about.
They were very satisfied with
the food.
They were only worried that
they'd gained too much weight
during their trip.
After dinner, passengers could enjoy
drinks in the lounge
and musical entertainment
around its specially-designed piano
constructed of aluminum
to save weight.
Next door to the lounge was
the reading and writing room,
where passengers could enjoy
a quiet hour with a book.
There was a typewriter
for the inevitable reporters
and private desks where travelers could
write to their loved ones back home.
Mail could even be posted from
the Hindenburg,

which maintained
a working post office in flight.
The Hindenburg rivaled the best
ocean liners in comfort and amenities.
Most of the passenger rooms were
doubles- efficient, but comfortable.
And if you were willing
to pay a premium,
you could enjoy the luxury of
a private stateroom.
But luxury didn't come cheap.
A ticket on the Hindenburg
cost $400 each way-
more than $4,000 in today's currency.
Amazingly,
despite the proximity of millions of
cubic feet of flammable hydrogen,
the Hindenburg also featured a smoking
room-isolated by an airlock
and equipped with
a single electric lighter.
But for most passengers,
it was the observation windows
on the promenade deck
that provided the greatest attraction.
Coasting along at 80 miles an hour,
less than 800 feet up,
the views were incredible.
There was always something new
to look at.
You could see fishes
or an ocean liner.
That was a major event.
Edith Dieckmann was married to
a Zeppelin Company physicist.
She and her husband joined
Hugo Eckener
on the Hindenburg's first
transatlantic crossing
and she recalls an unusual encounter
with a passing ship.
The captain of the ocean liner
made contact with Dr. Eckener,
and asked him if he would

deviate from the route
in order to fly over the ship, and
Dr. Captain Eckener, of course, agreed.
He even lowered a bottle of champagne
down to the ship,
and the first one broke, but
the second time he tried it, it worked.
For the crew, the thrill of flying
on the Hindenburg was matched
by the excitement of visiting ports
of call like New York.
I was just fascinated
by the skyscrapers.
The European cities,
compared to New York,
were really just provincial cities.
This was something
completely different.
Eugen Bentele was a mechanic
on the Hindenburg.
He and his fellow crew members were
treated like heroes wherever they went.
Bentele remembers one occasion
when he hitched a ride to New York City
and ran into a little trouble.
Just before we got to Holland Tunnels,
my driver must have made a wrong turn.
There was this whistling
sound-uh-oh, the police.
And we pulled over, and the policeman
was all ready to write us out a ticket.
Then the driver said to him,
"I have a man from the Hindenburg,"
and he waved us off.
And I would imagine that
perhaps only the astronauts,
who flew around the world
in 90 minutes,
could have had a stronger impression.
It was a wonderful way of traveling.
And I have to say, it was
the most beautiful way of traveling
that I ever experienced in my life.
Besides being beautiful, the Hindenburg

was promoted as being perfectly safe.
I am convinced that under all weather
conditions, even the most unfavorable,
we will be able to make the flight in
all regularity and safety. Thank you.
By the spring of 1937,
as Hitler continued his military
buildup and aggressive foreign policy,
many Europeans were becoming
increasingly nervous
about the possibility of war.
That may explain why ticket sales
for the Hindenburg were down
from the year before.
There had also been a series of
bomb threats in recent days.
Nevertheless, on May 3,
the inaugural flight of the Hindenburg's
second season proceeded on schedule.
Hugo Eckener wasn't on board,
but his heir apparent,
Ernst Lehmann, was.
It promised to be a routine flight.
The airship took off with 97 people
aboard, including 36 passengers.
One of them was Burtis Dolan,
a perfume company executive,
returning home to his wife Mildred,
after a four-month buying trip.
Anxious about his flying on the
Hindenburg, she had urged him to sail.
So he wrote to her,
apologizing for ignoring her wishes.
Not that I fear in any respect
the safety of the journey.
There is less risk than
ordinary flying.
Of course, Precious,
none of us know the lord's will,
and if anything should happen to me en
route, it will be too late to regret.
The crossing was uneventful,
except for unusually strong headwinds.
By the afternoon of May 6th,

the airship was 12 hours late.
One of those who remembers
its approach is Alice Taylor.
I had taken my mother to Asbury Park,
that was a seaside resort,
to shop for a birthday present.
It was almost time for the store to close,

it was nearly 6:
When we looked out the window,
to our surprise,
we saw coming directly toward us
through the clouds, the Hindenburg.
That sight I'll never, never forget.
I remember saying to my mother,
"Oh, I would love to give you a ride
on her for your birthday present."
She laughed and said, "Oh, but those on
that ship are the rich and the famous.
But that's a beautiful thought.
I'll dream about it."
The Hindenburg had been scheduled to
land at Lakehurst, New Jersey at 4:00.
But her landing would be
delayed further.
It was a completely ordinary trip.
Just like always,
sometimes there was bad weather,
sometimes good weather.
But when we arrived
at the airfield,
the entire area was filled
with thunderstorms.
We were going to have to fly around
in circles for about two hours,
I think, before we would be
allowed to land.
Verna Thomas lived just a few miles
from the Naval Air Station at Lakehurst.
All day long, this was all you heard
on the radio-
about the Hindenburg
being still delayed.
Around evening, when the word had

come through that the ship
was gonna come into Lakehurst,
my husband, he says,
"Let's go up and get into
the station and see it for good."
On the ground, crowds had gathered
as usual.
Print reporters and newsreel
cameramen were standing by.
Even a radio announcer
was covering the event.
We're greeting you now from the
Naval Air Base at Lakehurst, New Jersey,
from which point we're going to bring
you a description of the landing
of the mammoth airship, Hindenburg.

It was 7:
The storms had all but ended
and the Hindenburg was cleared
for its final approach.
Here it comes, ladies and gentlemen,
and what a great sight it is.
A thrilling one,
it's a marvelous sight,
coming down out of the sky,
pointed directly toward us
and toward the mooring mast.
Her mighty motors just roared
and throwing it back into
a gyre-like whirlpool.
All of a sudden, there came a call:
Six men to the front,
because the ship was too light
at the front.
I stayed halfway between
the pilot's cabin and the bow.
There was a hole somewhere there.
And I thought, "Well, I'll just
lie down here on the support beam
and I'll watch the landing."
During the landing maneuver,
I was busy at the motor,
so I could observe everything

exactly as it happened.
And I thought perhaps they had brought
the ship down too hard,
too fast, and that something
was torn or ripped.
And so I looked out,
and I saw that the ship from the stern
back to the first motor was on fire.
It burst into flames.
Get this Scotty, get this, Scotty.
It's terrible.
Oh, my! Get out of the way, please!
My father said, "My God, it's on fire.
Run!" We watched it burn.
We could see people jumping out.
It didn't look like anybody
could possibly survive.
I can't really remember the collision,
so I know that the ship must have
hit the ground with a very hard jolt.
I regained consciousness and then
I quickly began to run away
from the side of the motor.
But there was a stream of heat
coming from the enormous flames
above the ship.
Then, while I was running away,
I thought my clothes were on fire.
I put my hand up to my neck
to try and protect it,
and instead of my neck getting burned,
my hand was burned.
I thought to myself: "Now this is the end.
I can't survive the end."
And then it happened like this:
I came down nearly perpendicular with
my legs and landed in some sandy soil.
But almost immediately,
I got up again and I ran away.
I was lucky, because I was
running against the wind,
so none of the flames
from the fire were behind me.
And the thing that impressed me

was the intense noise
created by the collapsing of
the fabric covering
and the roar of the flames
was just a horrendous noise.
In front of me, maybe I was lucky,
a water tank exploded,
and perhaps it was the water
that protected me from the heat.
Now I could make my way to the door
and I kicked it open.
I could already see the ground coming
towards me and I jumped out.
I didn't think about anything.
My mind didn't start working again
until I was back on the ground
and I started running.
And then after awhile it came to me:
And I lost my nerve and I cried.
I wailed like a baby.
I didn't know what to do until
a couple of crew members came up to me
and shook me to my senses and said,
"Get a hold of yourself.
Try to help somebody."
But there was no one left to help.
It's a terrific crash,
ladies and gentlemen.
The smoke and the flames, and
the plane is crashing to the ground,
not quite to the mooring mast.
Oh, the humanity and
all the passengers.
I don't...
I have people and friends out there.
It's...
I can't talk, ladies and gentlemen...
Honestly, it's like mess...
It started from the tail
end between the two fins,
and went into the middle
and the forward section.
Within five seconds,
it was all on fire.

The explosion was so bad and the fire
was so heavy at that particular time.
I guess it looked like hell;
it was like hell on fire.
The ground crew and the people
that did dare to go back,
they were helping to pull bodies out.
Two American Navy soldiers grabbed me
and they took me to an ambulance.
And then little by little,
five or six more people came.
One of them was Max Pruss.
He had no nose anymore-nothing there,
no eyebrows, no ears.
Everything was burned off.
He was burned.
When I arrived there,
the dirigible was still burning.
Raymond Taylor was one of the first
doctors to reach the crash site.
I tried to identify some of
the corpses right away,
but some of them could not be
immediately identified
because they were so badly burned.
Also, a Jewish doctor, Dr. Adolf Tobin,
asked me if he could take care of
Captain Lehmann,
who was in charge of the ship.
His reason for wanting to
take care of him,
because he wanted to show Hitler
and the German people,
that he was very friendly toward them
and that the German people
should be aware that the Jews were
taking care of the injured,
and they should appreciate it.
But no doctor could save
Captain Lehmann.
He would die of his injuries.
And so would Burtis Dolan.
In Dolan's pocket,
they found the charred letter

he had written to his wife,
but never had a chance to mail.
It had taken just half a minute from
the first signs of trouble
to the fiery crash.
Now, 36 passengers and crew members
were dead or dying mostly
from burns and smoke inhalation.
Miraculously, two-thirds of those
on board survived.
My view of it all was entirely
different from the destruction.
Mine was that beautiful thing in the
air and that's what I like to remember.
I've seen the other ships,
but this was sort of the first cause
of excitement like that.
Maybe it was made more so
because of the tragedy.
The next morning,
Americans awoke to screaming headlines
and terrifying photographs.
For the first time, every detail of
a disaster was recorded as it happened,
and relayed to a shocked public.
Adolf Hitler sent a personal telegram
to President Roosevelt,
thanking him and the American people
for their help
in dealing with the casualties.
In New York, the German ambassador
made hasty arrangements
for the bodies of his countrymen
to be returned to the Fatherland.
Their flag-draped coffins would lie
in state on a Manhattan pier,
as local German citizens
paid their respects.
Then the dead were shipped home
on board the liner Hamburg.
But back in Berlin, the government
faced more than an aircraft disaster.
This was a public
relations catastrophe.

The Nazis saw it as a slap
in the face of German technology,
and so it didn't enter the newspapers.
It was sort of like
on the bottom of the page:
"There was a crash of
the airship Hindenburg.
And so many people died.
And here's the survivor's list."
That was about it.
Even the film footage was not allowed
to be shown in Germany to the public,
and most people didn't get to
see it until after the war.
Besides the shock of the tragedy,
and the embarrassment,
there were questions
waiting to be answered,
about what could have caused
this disaster.
German airships had carried
thousands of passengers
more than a million miles-in
perfect safety.
Was the Hindenburg brought down
by an act of sabotage?
As a symbol of the Nazi regime,
it may have been a tempting target
for opponents of Hitler.
Some have even suggested that
Hitler may have ordered
the airship's destruction himself,
perhaps in retaliation for
Hugo Eckener's anti-Nazi statements.
But no solid evidence was ever found
to support either of these notions.
Just four days after the crash,
the Commerce Department convened
a hearing at Lakehurst,
to examine the evidence.
Hugo Eckener headed
the German delegation.
In the end,
the Commission concluded that

the crash was an unfortunate accident,
caused by a discharge of
static electricity,
igniting a leak from
one of the airship's gas cells,
and touching off
an explosive hydrogen fire.
But decades later, a new theory would
emerge to challenge these findings.
Addison Bain is a retired engineer,
the former head of
Hydrogen Programs for NASA.
His expertise led him to
question prevailing ideas
about the Hindenburg disaster.
Well, with my experience
with hydrogen over the years,
starting in about 1960,
and designing systems and writing
safety manuals and that type of thing.
And I'd keep hearing about
the Hindenburg,
what about the Hindenburg,
the hydrogen exploded.
Well, it didn't.
To Addison Bain's trained eye,
the evidence was there all along,
in the photographs of the disaster:
The enormous fireball
that consumed the airship
could not have been produced by
burning hydrogen.
It was very apparent that
it was a very brilliant fire.
Again, that set my suspicions
into motion
because hydrogen generally burns with
an invisible flame.
Perhaps something else had fueled
the Hindenburg fire.
Why did this fire burn
so hot and so fast?
And fire investigators go off and look
for so-called accelerants or chemicals

and that kind of thing
that may have contributed to this.
And that's why I led off into
the chemistry of the airship design,
particularly the outer coating.
To find out what might
have fed the flames,
Bain went to Germany and visited the
Zeppelin Museum in Friedrichshafen.
There, in the archives, among files
of documents and blueprints,
he found the construction diagrams for
another airship-and an important clue.
When I arrived and started going
through drawings on the Hindenburg,
I also found drawings on the LZ130,
the sister ship of the Hindenburg-
the Hindenburg, was LZ129.
But the LZ130 had flown
after the Hindenburg
and it was exactly the same size.
I came across one particular drawing
that outlined the fabric covering
of the hull.
Now following down through the notes
on the left hand side of this drawing,
I come across notes
on the doping process.
They started off with
a coat of iron oxide,
very similar to the Hindenburg
doping process,
but then the next steps were coatings
of powdered aluminum bronze,
not just plain aluminum powder.
I thought, "Ah-ha,
this is interesting."
To Addison Bain,
it indicated that
the airship's designers had serious
questions about the doping compound
used on the outer covering.
They knew a number of problems.
They did a number of modifications

to their design,
all because of
the Hindenburg accident.
But hydrogen had been blamed
for the disaster,
so why did Zeppelin company engineers
focus instead on the fabric-
struggling to make it more
fire-resistant,
and less likely to build up
static electricity?
Did they know more than they let on?
To find out what was really
responsible for the fire,
Addison Bain would head into
the laboratory.
He had managed to secure
some rare artifacts:
actual shreds of
the Hindenburg's skin.
Placing a sample
in an infrared spectrograph,
Bain could analyze the doping
compound on its surface.
And when I discovered that the doping
process that was used on airships,
in general, uses a cellulose
nitrate type compound,
which was basically gunpowder,
and then used a combination of powdered
aluminum in the dopant process.
And I said, "Well, you know,
powdered aluminum is the fuel
used on the space shuttle."
So, here we have rocket fuel,
we've got gunpowder.
And I said to myself,
"Well, there's gotta be more to this.
They must have introduced
some other chemicals
to reduce the flammability
characteristics."
With a scanning electron microscope,
Bain could inspect the skin

at the molecular level.
He found nothing that would have
retarded the Hindenburg's flammability.
But he did manage to learn exactly
what the fabric was composed of
and recreate it.
With this new sample,
he could find out what would happen
if a flame or a spark made contact
with the fabric.
What I'm gonna do is burn a piece of
the lab sample that I prepared earlier.
First thing you'll notice,
it doesn't self-extinguish,
and it starts moving quite rapidly.
Notice the colorization of it-
typical carbon fire.
And another feature
that's very interesting is
the effect of the aluminum
against the iron oxide forms
little balls of thermite-
very highly reactive combination.
Those thermite balls get up to
Very simply, I believe that
the cause of the Hindenburg fire
was static electricity
that was built up on the envelope.
It found a path towards the frame,
across the panels,
and ignited the very,
very sensitive aluminum powder.
That, in combination with
the iron oxide and other chemicals,
was just a rapid chemical fire.
If Addison Bain is right,
then in spite of the official report,
the fire that consumed the Hindenburg
wasn't just an explosion of hydrogen.
It was actually fueled by the
flammable skin of the airship itself.
But even if hydrogen wasn't entirely
to blame,
the Hindenburg disaster sounded the

death knell for passenger airships.
With the outbreak of war,
Germany's last remaining airships
were reduced to scrap.
As for Hugo Eckener,
his glory days were over, too.
One of the world's most celebrated
figures would quietly fade into history.
Today, a subsidiary of the same
company that built the Hindenburg
is once again creating an airship.
In a hangar at Friedrichshafen,
the Zeppelin NT is taking shape.
That shape may be familiar,
but the technology is brand new.
Scott Dannekar is testing
this high-tech dirigible.
The Hindenburg is like an albatross
that has been thrown around our neck
and we've been wearing it
for the last 62 years.
We have to overcome the stigma of the
disaster and the failures of the past.
We have to prove
what an airship is capable of
and we have to prove its success.
And once we do that,
then I think we're well on our way
to restoring airships
to the prominence that
they used to have years ago.
This is a very different

kind of airship:
It features electronic controls
and computerized steering.
Its semirigid design sets it
apart from the familiar blimps
we see at sporting events,
but it's less than a third the size
of the Hindenburg.
And it's filled with helium,
not hydrogen.
If all goes well, the new Zeppelin

will be used for tourist flights
and scientific research-and perhaps as
a vehicle for transporting passengers.
Flying an airplane for me is a job.
It's something that you have to do.
Flying an airship is a joy.
There's magic with these things.
I think it's just the idea
of a giant silver-
or in this case white- airship just
floating serenely above the countryside.
There's just a magic there that for me
is just personally indescribable.
Is the Zeppelin NT the wave of the
future or just a nostalgic daydream,
a bid to recapture an elegant era?
The golden age of airships
may be long gone,
but magnificent giants like
the Hindenburg won't be forgotten.
They'll fly on forever,
floating majestically
across the landscape of memory.
I think everyone
who ever worked with airships
would really like to see one of those
huge objects in the sky again.
There's nothing more beautiful
than flying in an airship.
It's page one in the book of dreams.