

THE NEW YORK METS are after their third straight pennant . . . Hayley Mills, who won an Academy Award last year, is getting married . . . American astronauts have landed on the moon.

It's late summer, 1970, and the Andersons—Bill and Barbara—are among the first ordinary citizens booked to fly around the world in a supersonic airliner! They'll do it in less than 24 hours despite stops in eight of the world's great cities. Moreover, they'll do it the hard way, flying east to west, following the sun—and even gaining on it—all the way.

On the day of departure, the Andersons leave early for New York's International Airport so the children can get a good look at the plane. Sally, who was only in the sixth grade when

"Are those the switchblades, Dad?" Jerry asks, his nose against the glass.

"Well, they're often called that," Bill answers, trying not to show he has read up on the amazing supersonic plane. "Actually, they're known as variable-sweep wings."

"Are they the things that go back and forth?" Mrs. Anderson asks timidly.

"Yes, and we'll see them work in the air."

After the Andersons have checked their tickets and passports, the loudspeaker announces: "Supersonic Flight One, around the world, now boarding. Intermediate stops in San Francisco, Honolulu, Tokyo, Hong Kong, Bombay, Rome, Paris, and London, with complimentary meals in Honolulu, Hong Kong, and Paris. Departure, 7 p.m., New York time. Estimated arrival back in New York, 7 p.m. tomorrow night."

The Andersons follow the other passengers—

A thought hits Bill again. "Imagine it! We'll be going more than 2,000 miles an hour."

With a whine, the engines start up (they are more than twice as powerful as those on the old jets), and Miss Hart and Miss Allen walk up the aisle checking seat belts as the plane taxis.

It is 7 p.m., and the sun is just above the New York sky line.

The take-off run starts slowly but builds up quickly; the plane leaves the ground halfway down the runway. It's those flippers, Bill thinks, as he and the other passengers exchange nervous smiles of relief. It was no different than a take-off in a subsonic jet.

Just then, a frightening thought crosses Mrs. Anderson's mind. "Will all the airports we're going to land at be big enough for this plane?"

"Oh, yes," Bill says, patting her hand. "The plane was designed to operate from the same air-

surge of enormous power but nothing else.

Soon the captain speaks again, "We're now doing 1,000 miles an hour. Please keep your seat belts fastened because we're going up again."

Jerry looks back at his father and wails, "Dad, I didn't feel anything!"

"If you mean the sonic boom, Son, we don't feel that inside the airplane. But we're making one, and the people on the ground can hear it. We came up this high before going supersonic so it wouldn't be so loud down there."

Bill had reread the data on sonic booms—the one big unwanted by-product of supersonic flight. Any time a plane travels faster than the speed of sound (roughly 680 m.p.h.), it creates a shock wave about the same way the bow of a boat creates a wave in the water and sends it to both shores. The pressure in the sonic wave, however, is severe enough to crack plaster and break windows.

the sun is rising—in the west! How can this be? Here's the answer:

It takes any point on earth 24 hours to revolve away from the sun and return again, at a speed of slightly more than 1,000 m.p.h. at the equator. So if a plane could stay aloft 24 hours, it conceivably could point its nose at the sun and, by maintaining a 1,000-m.p.h. speed, keep the sun at the same point above the horizon constantly.

But since the supersonic airliner's top speed is 2,000 m.p.h., it actually gains on the sun. Even with fuel stops it can beat the sun around the world. Hence, the strange phenomenon of flying west and watching the sun "rise."

When the flight left New York it was 4 p.m. in San Francisco. About an hour and a half later, with the Rocky Mountains below, the captain announces, "We'll start our descent. Now you can

is airborne again, its flippers spreading as it climbs out over the wide, blue Pacific. When the plane levels out at 70,000 feet, the captain comes back to chat with the passengers, and Bill asks him: "Doesn't the plane heat up at these speeds?"

"Indeed it does," the captain says. "Friction on the nose and leading edges of the wings and tail surfaces creates temperatures of 600 degrees." Then smiling at Mrs. Anderson, he adds, "That's about as hot as your oven when you're broiling. It's about 400 degrees on the fuselage skin and also"—waving his hand toward Jerry—"on the outside of the window you have your nose pressed against."

Jerry jumps back, startled.

The captain laughs. "Don't worry, Son. It's well insulated on the inside. Air is drawn from the outside—it's pretty cool at 70,000 feet—and is circulated between sandwiched layers of the skin.

Around the World in 24 Hours

Seven short years from now, you may be taking this remarkable trip aboard a supersonic airliner that's so fast it never loses sight of the sun!

By KEVIN V. BROWN

President Kennedy announced that America would build the plane, will enter college this fall. Jerry, who is now 12, was then in kindergarten.

Entering the terminal building, the Andersons hurry to the tall vertical windows—and there's the plane!

It looks longer, yet smaller, than the big jets—the 707s and the DC-8s—they have flown in before. Its fuselage resembles a long, thin, slightly humpbacked cigar, tapered at both ends. Its tail section includes one of the three engines, mounted on top of the fuselage at the base of the vertical stabilizer and rudder. The other two engines are slung beneath the fuselage at the roots of the severely swept-back wings.

But the outboard section of each wing is the feature that everyone has been talking about. Right now they are sticking straight out like a bird sunning itself.

125 of them—down a long tunnel on a moving sidewalk. Inside the plane, two smiling stewardesses greet them.

"I'm Bernadine Hart," said one, "and this is Mary Allen." The girls seat the Andersons just forward of the "switchblade" wings.

Jerry rushes to beat Sally to the window seat—and he succeeds because she stops to admire the décor, done primarily in bright orange.

"It contrasts beautifully with the deep-blue sky when we get to 70,000 feet," Miss Allen explains to her.

Gosh, Sally thinks, 70,000 feet!

Bill and Barbara, seated behind the children, glance around at the interior. The long, thin cabin seems narrower than that of the subsonic jets—and it is, because for supersonic flight it must present a slimmer silhouette than the old 600-m.p.h. jets.

ports as the old jets so none of them would have to be enlarged. You see, when those flippers—I mean those variable-sweep wings—stick straight out, they allow the plane to operate the same as an ordinary jet with normal wings. They'll come halfway back when the plane crosses the sound barrier, and all the way back when it gets up to 2,000 miles an hour."

The airliner crosses the coast of New Jersey, climbing steeply but still accelerating. Over the cabin loud-speaker, they hear, "This is the captain. We'll climb to 40,000 feet before going supersonic. That will be shortly after we cross into Pennsylvania. So you can watch the wings retract if you like."

Jerry keeps his nose against the glass and his eyes on the flippers. In a few minutes, the plane levels out and the wings start back, locking in place about halfway. Jerry can feel a steady

Fortunately, this pressure dissipates the farther it is from the source. As a result, all supersonic flying is done above 35,000 feet, an altitude high enough to dissipate the shock wave sufficiently to save windows.

The boom, however, can still be heard. It's a noise that people on the ground will have to get used to, just as they did the noise of steam locomotives and horseless carriages.

When the plane reaches its assigned altitude of 70,000 feet, the wings come all the way back, forming one long tapered wing with the root section. But as the plane accelerates to its top speed, Jerry again is disappointed. Here they are—flying along at 2,000 m.p.h.—and he can't feel a thing! There just isn't any sensation of speed at that altitude because there is nothing around to relate to.

There is another sensation, however. Up ahead

watch the wings work in reverse."

As the engine power is reduced, the plane slows slightly and the wings start out, stopping about halfway. Then the plane noses downward. It levels out again and decelerates some more. The wings come all the way out, and the Andersons know they are once again below the speed of sound. The plane noses downward again and, up ahead, they can see San Francisco's Golden Gate, more golden than ever in the late-afternoon sun.

The wheels touch down at 5:48 p.m., California time. Bill glances at his watch, and thinks: it's like landing before you take off. He knows, however, that the flight has lasted 1 hour and 48 minutes and that it is now 8:48 p.m. in New York and will continue to get later no matter how much time they gain on the sun.

After a 30-minute stopover for fuel, the plane

"That window, for instance, has three layers of aluminosilicate glass, the same kind used on the old X-15 and our Mercury and Apollo satellites. The air flows between the layers, cooling them. Pure insulation is used in some strategic areas to supplement the air flow—up in the nose, for instance.

"Insulating the interior was never a problem—but the exterior temperatures were. The old jets were made of aluminum. It's still a fine metal, strong and lightweight, but it loses strength at high temperatures. This plane (and all other such supersonic planes) is made of steel and titanium. They're heavier than aluminum but stronger at higher temperatures. We're really flying in the first stainless-steel plane."

As the plane lets down for Honolulu, the Andersons prepare for one of the features of their flight around the world, a Hawaiian luau.

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