



Hunt Institute for Botanical Documentation
5th Floor, Hunt Library
Carnegie Mellon University
4909 Frew Street
Pittsburgh, PA 15213-3890
Telephone: 412-268-2434
Email: huntinst@andrew.cmu.edu
Web site: www.huntbotanical.org

The Hunt Institute is committed to making its collections accessible for research. We are pleased to offer this digitized item.

Usage guidelines

We have provided this low-resolution, digitized version for research purposes. To inquire about publishing any images from this item, please contact the Institute.

Statement on harmful and offensive content

The Hunt Institute Archives contains hundreds of thousands of pages of historical content, writing and images, created by thousands of individuals connected to the botanical sciences. Due to the wide range of time and social context in which these materials were created, some of the collections contain material that reflect outdated, biased, offensive and possibly violent views, opinions and actions. The Hunt Institute for Botanical Documentation does not endorse the views expressed in these materials, which are inconsistent with our dedication to creating an inclusive, accessible and anti-discriminatory research environment. Archival records are historical documents, and the Hunt Institute keeps such records unaltered to maintain their integrity and to foster accountability for the actions and views of the collections' creators.

Many of the historical collections in the Hunt Institute Archives contain personal correspondence, notes, recollections and opinions, which may contain language, ideas or stereotypes that are offensive or harmful to others. These collections are maintained as records of the individuals involved and do not reflect the views or values of the Hunt Institute for Botanical Documentation or those of Carnegie Mellon University.

About the Institute

The Hunt Institute for Botanical Documentation, a research division of Carnegie Mellon University, specializes in the history of botany and all aspects of plant science and serves the international scientific community through research and documentation. To this end, the Institute acquires and maintains authoritative collections of books, plant images, manuscripts, portraits and data files, and provides publications and other modes of information service. The Institute meets the reference needs of botanists, biologists, historians, conservationists, librarians, bibliographers and the public at large, especially those concerned with any aspect of the North American flora.

Hunt Institute was dedicated in 1961 as the Rachel McMasters Miller Hunt Botanical Library, an international center for bibliographical research and service in the interests of botany and horticulture, as well as a center for the study of all aspects of the history of the plant sciences. By 1971 the Library's activities had so diversified that the name was changed to Hunt Institute for Botanical Documentation. Growth in collections and research projects led to the establishment of four programmatic departments: Archives, Art, Bibliography and the Library.

SST

United States Senate

WASHINGTON, D.C. 20510

June 9, 1971

Mr. George B. Vanschaack
48111 Lincoln Lane
Lisle, Illinois

Dear Mr. Vanschaack:

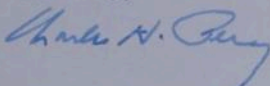
When attempts were made to breathe new life into the SST a mere eight weeks after the Congress had clearly expressed its will that no more funds be allocated for this project, I was frustrated and perplexed. I suspect this reaction was shared by many other citizens across this nation as well.

But, as you know, the Senate again turned down the request for SST funds by an impressive vote -- the widest margin yet. As in the past, I worked hard for this result and was pleased by the outcome.

The only respect in which the issue differed from previous debates was that this time we had the advantage of cost estimates provided by Boeing itself. When Mr. William Allen, Chairman of the Board of Boeing, indicated that the new revival of the SST program would require half-a-billion to one-billion more in Federal money than was needed before the project was terminated, he made our case for us.

I'm enclosing a copy of the full statement I made at the time of the most recent vote. Thanks for your letter.

Sincerely,



Charles H. Percy/ecg
United States Senator

Enclosure

SST

United States Senate

WASHINGTON, D.C. 20510

May 21, 1971

Mr. George B. Vanschaack
4111 Lincoln Lane
Lisle, Illinois

Dear Mr. Vanschaack:

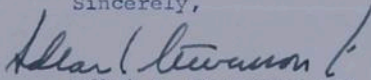
Thank you for your communication about the attempt to revive Federal funding for the SST, which passed the House some days ago. On May 19, the Senate passed the Proxmire amendment to delete further funding by the decisive margin of 58-37. My vote was cast for this amendment.

My continued opposition to the project rests on three major objections: serious doubt about the aircraft's effect on the environment; doubt as to the wisdom of Federal subsidies for commercial projects; and the crucial issue of national priorities. In all three of these areas, for me the SST strikes a negative note.

I hope that the House of Representatives will accept the Proxmire amendment in the Senate version of the bill and make no further attempt to revive the SST.

With best wishes,

Sincerely,



Adlai E. Stevenson III



Congressional Record

PROCEEDINGS AND DEBATES OF THE 92^d CONGRESS, FIRST SESSION

Vol. 117

WASHINGTON, MONDAY, MAY 17, 1971

No. 72

The PRESIDING OFFICER (Mr. SAXBE). The Senator from Illinois is recognized for 10 minutes.

Mr. PERCY, Mr. President, 8 weeks ago, when the Senate and the House voted to refuse further Federal funds for the SST, the decision was widely acclaimed as a victory for economic commonsense, a step forward in the journey to right our national priorities, and a long-awaited official acknowledgement that we must have answers to environmental questions before we proceed to a point of irreversible ecological degradation. I find it very difficult to believe that we are fighting this same battle again.

The part I assumed in that battle some weeks back was based almost entirely on the economic problems that I saw ahead if we continued with the development and production of an SST.

In the brief span of these 8 weeks, the issues surrounding the SST have not changed. There have been no new answers propounded to the environmental questions. Nothing has happened to reduce the enormous financial risk inherent in SST development. No new private financial backers have arrived on the scene indicating their faith in the program and their willingness to invest in it. The airlines have shown no new capability to buy the SST once it is produced. And there is no new evidence indicating that the cost estimates are accurate.

The only respect in which the issue we are now debating differs from that decided in March is that the specific request for funds is smaller. In March, we were debating the wisdom of appropriating \$290 million; now we are debating the wisdom of appropriating \$85.3 million. On the surface, it may appear as though \$85 million would be more easily justified than \$290 million, but on closer examination it must conclude that just the opposite is true.

The fact that Boeing has dispersed many of its people and terminated subcontracts since the March vote is no secret. Regular news broadcasts have kept America posted on the readjustment process that the company has had to make. Many of us in Congress—on both sides of the aisle and on both sides of the SST issue—have sought to make a legislative response equal to the need, particularly with respect to the unemployment problem.

The winding down of the SST project which followed the congressional rejection of continued appropriations 8 weeks ago will create new problems and new

costs if the project is revived. William Allen, chairman of the board of Boeing Co., indicated just last week that revival of the SST program would require half a billion to one billion dollars more in Federal money than was needed before the project was terminated. In the speech I made on the Senate floor just prior to the March vote, I expressed serious doubt as to the reliability of the cost estimates offered by SST proponents. At that time I said:

We have been told that prototype development will cost \$1.3 billion. . . . But the nature of developmental research makes this promise illusory.

Mr. Allen's newest cost projections are stark confirmation of my suspicions.

As grim as the prospect of an additional half-billion to one billion dollars is, it is made worse by the absence of any financial plan for production of the SST. In March, I reiterated my refusal to vote to fund a project on which there had never been a financial plan prepared and on which there had, therefore, never been any substantiated cost estimates nor cost limitations established.

We had been told that Federal participation, in any case, would be limited to development of the SST prototypes. Now, Mr. Allen indicates that, if the SST is revived, the Government will have to advance funds to start production.

All of the things we have said over the course of the past several months concerning the inappropriateness and the foolhardiness of investing Federal dollars in the prototype program are even more pertinent when applied to Federal support of production of the SST. If this country has any faith in the private enterprise system, if we believe at all that products should have to stand the market test of supply and demand, if we conceive of Government's role as primarily regulatory and not developmental with respect to its relationship with industry, and if we are committed to applying the limited Federal resources to programs which serve the best interests of all Americans, I simply cannot find a justification for our putting another cent in the SST program.

Mr. President, when Mr. Allen made his statements concerning the prospect of another \$85.3 million being appropriated for SST development, he in effect confirmed what many of us have been saying for many months: That the costs could not possibly be limited to the \$1.3 billion amount originally estimated and that Federal involvement would not end after the prototype stage. This really is

the only advantage I see in having to debate again the SST question: We finally have on public record the statements of the head of the major contractor company confirming our worst fears. It is both significant and helpful that one of America's most prominent and respected industrialists has made our case for us.

In addition, General Electric has issued statements in which they indicate that it is their view that the project can no longer be continued with 90 percent Federal funds and 10 percent private; instead, it will require 100 percent Federal funds.

I will speak tomorrow on the situation regarding the airlines, but I felt it was extremely interesting to have fully revealed to us the circumstances under which the airlines voluntarily contributed \$58 million toward the production of the SST.

The voluntarism exercised reminds me of the "hot box" in a fraternity house where tactics fall a little short of rubber hoses. When the airlines were called in to the Department of Transportation and told that they were expected to contribute \$1 million toward every plane, as regulated companies standing before those who have the responsibility not only for regulating them but who can also set life and death sentences over the companies, how voluntary are the contributions of \$58 million made by the airlines toward this SST project?

So this whole exercise that has intervened during the 8-week period has at least revealed that everything we have said has been confirmed by the Boeing Co. and by General Electric, the major contractor. We have smoked out what really happened when the airlines, presumably voluntarily made contributions toward the SST in their desire to see it go into production.

There is no need to rehash all the arguments for and against the SST. Every Senator has studied all the factors and made a decision. The issue we must decide now is whether the expenditure of \$85.3 million at this time to revive the SST is going to do more harm than good; will the investment actually be worth it?

What will we accomplish if we make this investment, Mr. President? First, we will breathe just enough life into the program to cause it to pulsate for a moment, but not enough to insure new

S 7073

Put SST on the back burner

They landed the Concorde, the British supersonic airliner, at Heathrow Airport outside London in a test the other day.

The noise and smoke were apparently not to be believed, 30 houses lost slates off their roofs and residents moved immediately to petition the government to ban the monster. We hope they succeed, just as we hope the United States suspends the building of the supersonic transport in this country. If there is one thing that exceeds the speed of an SST, it is the headlong rate at which the government, powered by a greedy Congress and Industry, rushes into technological Terra Incognita.

Twenty years ago, the aircraft industry screamed to Washington that the British had stolen a march on the U.S. in the development of commercial jets.

The industry got no help because the airlines, suffering from the shorts, were in no great rush to convert from propeller-driven craft.

The result was, according to a Princeton economist named George

Eads, that a better and cheaper jet was developed by taking it slow.

Similarly, he and a lot of other good minds say the state of the SST art is such that it is highly questionable whether the proposed two prototype SSTs should be built without further research.

There are reasons for this which go beyond economy. For one thing, the plane is a fantastic polluter — of ears and water and air.

For another, we frankly do not buy the assurance that it will never be flown at supersonic speed over land. These things change — always, of course, in the name of "progress."

And just for the record, don't people at sea have any rights?

When he announced the plans to build the prototype, President Nixon said that "national prestige" would suffer if we let other countries get ahead of us.

Excuse us, Mr. Nixon, but this argument may be great for the Boeing workers, but not for most of us. We watched this country put men on the moon, and we aren't worried about our prestige in the air.

Chicago Sun-Times Sept. 17, 1970

Dear Senator:

I strongly urge you to STOP THE SSTs -- because they would:

Inflict jolting sonic booms on a large fraction of the earth, night and day.
Startle as many as 20,000,000 people per transcontinental flight.

(Note: the FAA still has not banned SST supersonic flight over land.)

Convert the oceans into sonic boom dumping grounds.

Create intolerable noise at airports and in nearby suburbs.

Expose passengers to dangers from lightning, flash-fire, sudden loss of
cabin pressure, ozone, cosmic rays.

Require multi-billion-dollar subsidy by the taxpayers.

Become a gigantic financial failure -- because it would be far outclassed
by the 747 Jumbo Jet. (The 747 has 50% greater capacity, 50% greater
range, is much roomier and safer, costs 50% less, has much lower fares,
requires no subsidy by the taxpayers, and has no sonic boom.)

Why spend billions of dollars to develop an SST that is already doomed? - That
nobody needs? - That the airlines cannot afford? - That creates vast problems
for the environment while solving none for transportation?

PLEASE STOP THE SSTs.

Signed _____

Address _____

15 SEPTEMBER 1970
VOL. 20 NO. 13

American Institute
of Biological
Sciences

Editorial Board

Helmut K. Buechner, Edward S. Deevey, Donald S. Farner, Philip Grant, A. C. Leopold, Edward P. Radford, Howard A. Schneiderman, Philip Siekevitz, and Herbert Stern.

Editorial Staff

Publisher: John R. Olive
Editor: Francis S. L. Williamson

Head of Publications and
Associate Editors:
Robert S. Leisner

Secretary
Allice C. Mansfield

Managing Editors:
Margaret U. Chambers

Editorial Assistant:
Patricia M. Garkin

Features and News Editors:
Walter G. Peter III

Associate News Editors:
Jo Ann V. Fowler
Karen J. Fling

Business Staff

Advertising Production:
D. Anne Harberger

Institutional Subscriptions:
Frank Lo Verde

Membership: Joanna Buckle

Opinions expressed by authors are their own and do not necessarily reflect the opinions of the American Institute of Biological Sciences nor the institutions with which the authors are affiliated.



Circulation audited by Verified
Audit Circulation Corporation

Editorial and business address: American Institute of Biological Sciences, 3900 Wisconsin Ave., NW, Washington, D.C. 20016. Printed at Editors Press, Inc., 6041 33rd Ave., Hyattsville, Maryland 20782. National Advertising Representatives: Joseph Bourgholtzer, Inc., The JBI Building, Mahwah, New Jersey 07430. Advertising rates and information mailed on request.

BioScience

THE SST, THE ENVIRONMENT, AND THE CREDIBILITY GAP

It now appears that the government of this country has dedicated itself to the production of a machine called the supersonic transport (SST). Apparently it has done so because (1) a few American travelers may save perhaps an hour or two on a transcontinental flight or crossing an ocean; (2) the Department of Transportation SST Development Chief believes that the country might lose an estimated \$22-50 billion if European manufacturers "corner the market," and (3) the ATA President believes that "it is in the national interest that our flag airlines continue to be strong and effective competitors in international air transportation."

The SST Environmental Advisory Council has concluded that projected SST operations are unlikely to cause significant climatic changes, but that there are uncertainties (emphases mine). The recent MIT-sponsored *Study of Critical Environmental Problems* concluded that CO₂ produced by the SST may cause no problem but that water vapor may increase 10% globally and up to 60% locally. Particles from SO₂, NO_x, hydrocarbons, and soot may double global averages existing prior to the Mt. Agung eruption in 1963 and peak at 10 times those levels where there is dense traffic. Effects of these changes on climate could include increased clouds from water vapor and increased temperatures in the stratosphere with possible increases in surface temperatures. After the Mt. Agung eruption, the temperature of the equatorial stratosphere increased 6-7 C and remained at 2-3 C above pre-Agung levels for several years. Neussle and Holcomb (*Science*, 168: 1562) stated that most meteorologists agree that gaseous products other than water will present no special problems, although not enough is known about gas exchange in the stratosphere for certain prediction. They state that the water produced could directly change the radiation balance of the earth. Finger and McInturff (*Science*, 167:1616) state, "a prominent question is whether we have sufficient knowledge of the higher atmospheric layers and sufficient instrumental accuracy to provide the needed operational support [of the SST]." The *First Annual Report of the Council on Environmental Quality* stated concern over man's ability to modify climate generally, including increasing the water vapor content of the stratosphere, and recommended that further study is necessary to better determine the effects of the SST before mass production begins.

Nonetheless, we blunder on. The present Administration has stated that it is committed to preventing degradation of the environment. Why, then, does the regulation of noise produced by the SST remain the responsibility of the Department of Transportation? Why is it that less than 1% of federal research money for weather modification studies is going to programs concerning inadvertent changes in climate? Why has research on the effects of the SST been made the responsibility of the Department of Transportation? The estimated totals of federal funding for pollution control and abatement programs in the fiscal years 1969, 1970, and 1971 were \$763 million, \$886 million, and \$1.38 billion, respectively. Nonetheless, a sum of \$290 million has just been approved by the House of Representatives for the development of a prototype SST, a sum equal to a fifth of the Fiscal 1971 funding for pollution abatement and control. Estimates of the ultimate cost of the SST program go as high as \$6 billion. There is presently no airport designed for the operation of such a plane. The costs for development could easily equal 5 or 6 years of total federal funding for pollution control. There is indeed a credibility gap when we embark upon a program that is a potential global threat, allow it to be regulated by those whose interest is in favorable trade balance and our "leadership" in aviation, and simultaneously state that pollution of the air is our most serious environmental problem. The development of the SST thus conflicts with the basic philosophy behind the establishment of the Environmental Protection Agency; i.e., the prevention of environmental degradation, even before that agency actually exists.

FRANCIS S. L. WILLIAMSON

Dear Member of Citizens League Against the Sonic Boom:

November 18, 1972

The threat of the Anglo-French Concorde SST continues. Sixteen production-type Concordees, bigger and "bolder" than the prototypes, are being built. The first is nearly ready for testing. BOAC has ordered 5, Air France 4, Actual service could start in 1975, if the program is not halted.

Sonic Boom The plane's boom is worse than had been predicted. The typical overpressure is 2.0 to 2.5 psf, with occasional booms of 4 to 8 psf. Flights over Cornwall, Wales, etc., produced a flood of protests & damage claims. Damage payments totaled £ 35,622(\$85,000)--\$100. per mile of flightpath.

Noise at Takeoff & Landing The Concorde prototype is "the noisiest civil aircraft in the world" per Electronics Today of Sept. '72. Its "perceived noise" (PN) is 125 to 135 PNdB. The (modified) production plane will produce 120 to 125 PNdB --more than 20 PNdB noisier than the subsonic (boomless) DC-10, L-1011, A-300B. One Concorde is equivalent to a hundred L-1011's taking off simultaneously.

Pollution of Stratosphere The threat that a fleet of Concordees would pose to stratospheric ozone looks increasingly grim. See recent reports by Nat'l. Acad. Sci. and by Dept. of Transportation.

Opposition to Concorde The opposition, led by B. Lundberg in Sweden, the Anti-Concorde Project in England, and GLASB in America, is thriving. Only two airlines have placed firm orders: BOAC and Air France. Three airlines (United, Air Canada, Sabena) have canceled their orders. Pan Am and TWA may cancel too --because of the environmental nuisances and also the whopping price of the plane: about \$59,000,000 with spare parts etc. (This is more than twice the cost of a DC-10-30, which holds twice as many people, flies 50% farther, and uses only 1/3 as much fuel per passenger-mile.) GLASB has been sending to airlines heads, govt. officials, etc., a steady stream of factual reports & pamphlets on Concorde's offending features. GLASB's leadership in opposing SSTs is given top billing in a major article "Public Interest Science" in the Sept. 29 Science. Note: We are keeping a wary eye on White House spokesmen who predict that a new, more costly (\$5 billion) US SST program will be undertaken.

GLASB NOW NEEDS MONEY. Please make out checks to:

GLASB, 19 Appleton St., Cambridge, Mass. 02138

Sincerely
William A. Shirreff
William A. Shirreff, Director

WASHINGTON REPORT

New information on the environmental impact of supersonic transport planes, coupled with revelations of a "sweetheart" contract between government and aircraft manufacturers for its production, has stoked up efforts to block a \$290 million federal subsidy for the next phase of the project.

The new developments brought together some 30 conservation, consumer, labor and other organizations in a renewed drive to stop Congress from increasing the \$630 million already expended for an aircraft judged by economists as non-competitive in the world transportation scheme. The coalition has been telling members of the Senate that the \$290 million allocation for fiscal 1971 work on the SST should be eliminated.

The coalition formed to oppose the SST has based its disapproval on grounds in addition to the evidence presented by the scientific community that SST operations have potential environmental hazards beyond those previously encountered by mankind. Hearings before Congressional committees have raised major questions of public policy.

The House Appropriations Committee held hearings on the contract between the Federal Aviation Administration and the Boeing Aircraft Company. It found that after the two prototype planes had been built under the current contract, the U.S. government, having spent \$1.3 billion, would not receive one penny in return. The contract only provides that when production of the SSTs moves into high gear, the U.S. Treasury will receive a royalty on production. For example, when Boeing has sold 139 of the boom-creating aircraft, the U.S. government will be in the hole by \$1.183 billion, while Boeing will have had a profit of \$150 million.

In recent memory, this contract between the FAA and Boeing is the first where a \$1 billion interest-free loan has been made available to a corporation so that it can gain a monopoly on production. The FAA Boeing contract provides that the government put up 90 per cent of the cost of two SST prototypes, without interest. The interest will be paid only as the aircraft are sold over the break-even figure.

These facts were brought out at length in a paper presented by Wheaton College Professor John Walgreen, an economist who assisted former Department of Defense Secretary Robert McNamara in a review of the SST program.

Dr. Walgreen said: "The SST subsidy will be drawn from general tax revenues and granted to highly skilled workers in the aircraft industry, stockholders of the SST manufacturers and their suppliers,

and air travelers who can afford faster transportation at prices that do not reflect all the costs involved... If flight paths are restricted, the program will lose about a billion dollars."

Another strange facet of the contract between the manufacturer and the U.S. government is that the agency representing the taxpayers—the FAA—is also the promoter of the product. The FAA is supposed to establish standards and certificate aircraft for safe operations. In the case of the SST it has taken on the role of developer and creator. The Congress has never authorized the construction of the SST, but an obscure section of an appropriation bill gives it the leeway to develop advanced aircraft types. This is the basis for the go-ahead by the FAA for pouring public funds into SST commitments.

Arguments have been made that the SST will provide employment in a distressed aircraft industry. However, on April 30, 1970, the Assistant Secretary for Manpower in the Department of Labor told the Joint Economic Committee that the net employment increase from the SST would be negligible and that SST production would do little to benefit those lower skilled workers hardest hit by the current downturn.

The same committee heard testimony from a well-known economist, Mary Goldring of the *London Economist*, that the high-priced SSTs will have to be subsidized by airfares paid by those who ride in tourist class on regular airlines.

The dollar drain on the Treasury, as described by leading economists, does not take into account the environmental cost of the SST. Dr. Richard L. Garwin, a physicist who headed a panel of President Nixon's Science Advisory Committee on the SST, said the airport noise from the plane would be "equivalent to the simultaneous takeoff of 50 of the loudest aircraft allowed under FAA certification requirements."

At Senate hearings, Dr. Gordon J. F. McDonald, the scientist member of President Nixon's Council on Environmental Quality, said that supersonic transport injections of water vapor into the upper atmosphere decreases ozone protection from ultra-violet rays.

"This is potentially such a significant problem that we really must understand it before proceeding in any way to alter the water vapor content of this part of the atmosphere," Dr. McDonald said.

The \$290 million for the SST program will be a large factor in the \$1.3 billion deficit for the end of fiscal 1971 predicted by the Administration.

— W. Lloyd Tupling

United States Senate

WASHINGTON, D.C. 20510

March 10, 1971

Mr. George B. Vanshaack
Morton Arboretum
Lisle, Illinois

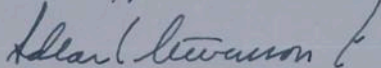
Dear Mr. Vanshaack:

I appreciated your telling me of your opposition to further funding for the SST. Last December, when the matter was before the Senate, I was one of the 52 Senators who voted against further appropriations for the SST. Unfortunately, the House-Senate conference committee restored some of these funds, but the authorization is due to expire March 31, and the matter will again come before the Congress.

I will continue my opposition to this project. The SST poses unacceptable threats to our environment and diverts scarce tax dollars from urgent domestic needs. Because supporters of the SST are going all out to secure more Federal funds, it is vitally important that you continue your efforts.

With best wishes,

Sincerely,



Adlai E. Stevenson III

STATEMENT ON THE OPERATION ECONOMICS OF
CONCORDE AND THE BOEING SST PROJECT 2707

by
Bo Lundberg^{x)}

My recently concluded BL Report 145, "The Economics of Supersonic Transport Operation" describes a method for comparing the relation between the operation economics of SSTs and competing subsonics, and application on Concorde and the Boeing 2707. The report is in my opinion conclusive proof that these SST projects will be grossly uneconomical in operation because of their exceptionally high seat-mile cost. This will for the Boeing 2707 be 60 to 80 percent higher than for Boeing 747, and the seat-mile cost of Concorde will be at least 100 percent higher.

These results cannot be refuted by the SST proponents because my computations are based on information from Boeing and the manufacturers of Concorde about purchase price, payload, fuel consumption, and all other essential characteristics.

In view of this the following main conclusions of my report are also indisputable:

1. The SSTs can take over practically nothing of the - dominantly large - economy (tourist) class subsonic market, unless the airlines are to suffer ruinous losses by applying economy-class fares.
2. The SSTs can take over only a limited part of the small first class market (at close to first-class fares).
3. Such operation will yield returns on investment much less than for the subsonics, and this will result in either increase of subsonic fares or requirements of subsidies.
4. My report and these conclusions apply for the case of no sonic boom restrictions. If the SSTs are not allowed to fly at supersonic speed over inhabited land - which now seems practically certain - their operation economy will be even more inferior to that of the subsonics.
5. The computations in my report are based on the purchase prices that are estimated by the manufacturers on the assumption of many hundreds of SSTs being built (of the order \$ 50 million for the Boeing 2707 and \$ 25 to 30 million for Concorde). The diminutive market for the SSTs - only a part of the small first-class, over-ocean market - requires merely a few dozen Concorde or Boeing SSTs. These small series will result in production costs per aircraft at least twice as high as those assumed by the manufacturers for their estimates to the airlines of purchase prices. As the airlines most certainly will not pay much more for the SSTs than the price indicated by the manufacturers, the production will incur tremendous losses which must be covered by subsidies.

^{x)} Aviation Consultant, former Director General of the Aeronautical Research Institute of Sweden. Member of the ICAO Sonic Boom Panel and a member of the Swedish Government Documentation

Thank you 3/23 kind words! W. Shureliff
Washington Post 3/21/71

From Jean-Jacques Servan-Schreiber

A European View of the Supersonic Transport

Servan-Schreiber, former editor of *L'Express* and author of "The American Challenge," is a deputy to the French National Assembly from Lorraine. The following is excerpted from a statement he submitted to Senator Proxmire, chairman of the hearings on the SST.

THE DEBATE in the Congress of the United States on supersonic transport may remain in the history of the industrial state as the first truly universal debate. The problem is the same in each modern democracy—man and technology. Decisions of government and parliaments in each of our nations has immediate consequences on all others. In view of the SST debate there is no such thing any more as "national independence." The multinational political decision at long last, confronts the multinational industrial complex. . . . France and Great Britain now have nine years' experience with supersonic transport and that experience can, perhaps, shed some light on this vital debate.

Every single cost analysis from the beginning has proved to be wrong. The cost of the [French-British] SST has multiplied here, as it will everywhere, four times since the initial evaluations. By all normal decision-making systems, it should have been canceled long ago, but the debate and the cost have for years been kept from the public. The facts have not been available until the most recent months when they could no longer be hidden.

Now the public eye is on the project and what it sees is bankruptcy. The Rolls Royce disaster of last month already looks small compared to the financial quagmire of the SST.

NOT ONLY those who had doubts about the project, but more and more former supporters of supersonic transport are now frightened by the project. Mr. Charles de Chambrun, a major political figure of the ruling party in France, making a special report for his parliamentary committee declared: "Even a superficial analysis now reveals to us a terrifying truth, on purely prestige projects (like the supersonic aircraft) we are throwing away billions with no hope whatsoever of any future commercial returns. So much so that we should urgently face these problems and if possible, before they become public scandals." Former Conservative Prime Minister Antoine Pinay, a cautious and respected man,

who seldom speaks out in public, decided last week that he could no longer remain silent and came out flatly against it as an immensely costly gadget on taxpayers money designed for an incredibly few rich people, mostly North Americans. The impact of his unprecedented and violent attack is shaking the establishment and prefaces more defections from the pro-SST ranks among public figures.

If the number of persons in America that could profit by SST flights is evaluated, officially, at 0.5 per cent of the population, that figure in France is only 0.3 per cent—thus an unavoidable political assault, in a country like ours where housing, schools, hospitals, roads, telephones, urban problems are in such dramatic need of immediate attention. . . . In Paris, for instance, it has been revealed that over 70 per cent of housing dates back to 1920, and only less than 10 per cent has been rebuilt in the last 20 years. Also, Paris, considered the most advanced city in France, 52 per cent of housing is without central heating and 45 per cent has no internal sanitary facilities. Again in Paris, there is, today, only one child care center for 2,000 working women with children.

For the first time since General de Gaulle left the public scene these truths are rising to the surface. A fundamental reappraisal of the whole range of public appropriations is the inevitable result. In face of these social scandals the SST has now few defenders. Only those directly concerned by the contracting industries are still openly in favor of the project.

Even if there were no problem at all of public opinion of urgent social needs, there are now even more pressing problems confronting the SST builders and their clients. We shall note here the latest developments in the first two months of this year.

The minimum transport capacity of the European SST was considered to be, as of last year, for any competitive use, 134 passengers per plane. After the first flight tests this capacity is now being reduced to 110, or less. At that level, the plane can be bought by Air France and BOAC only if it flies at full capacity on every flight. An impossible assumption, as any airline executive knows.

The flight distance of the European SST has also been drastically decreased. It is still considered able to fly from Paris and London to New York, but it is now officially admitted that it will not be able to fly from Berlin to New York and not even from Rome, Hamburg or Frankfurt. The use of the SST for European airlines is shrinking. Practically, the British and French clients are, at this point, left alone.

Maintenance costs for the SST climbed from the first estimated 30 per cent margin for present jet planes to 60 per cent at least, in the latest accounting. The initial and basic idea that the fare for an SST passenger would not be more than the first-class seat today on normal jet aircraft is abandoned. The SST passenger will have to pay at least 30 per cent more than the first-class fare. At that price level, company executives, not paying for their own travel expenses, will be the only routine passengers taking advantage of the new plane.

Finally, the latest requirements from airlines to add qualitative changes in order to lower the noise level and to make luxury flight more comfortable have been flatly refused by the builders as impossible within the present budget, already 300 per cent over the initial estimations.

SOME major leaders of the pro-SST crusade have now decided in my country to express in public their unwillingness to continue the project under present conditions. Among them the Chief Executive of the SST program in Toulouse has considered it to be his duty to release, last month, some new facts and figures in an unprecedented press conference.

Since its first test flight in 1969, the SST prototype has flown less than 10 per cent of the number of hours of test flight that were planned as a minimum for testing the project. Also, he revealed, in anger, that the budgeted investments planned for the middle of last year had still not been allocated by the government.

He made public that, on the basis of the latest developments, a new postponement of test flights is unavoidable. What was planned to be achieved in 1973 will not be accomplished before the second half of 1974. Finally, he concluded, that all of this will cost an eventual loss of 50 SST commercial options per year and that one more delay, after the deadline of 1974, would simply see the European SST cancel itself out of any possible market.

The conclusion in France today, after a few weeks of publicly airing the facts, is that the project is, at a minimum, a commercial and financial disaster. Technologically it has lost most of its significance for two reasons. First, because the engineers and scientists are not permitted to continue their research due to budget limitations. Second, the only remaining technological fallout (supersonic flight experience) has lost its meaning since this aircraft will not be the first of its generation of planes, but the last. To create a new generation of aircraft a varied geometry wing system and new metal alloys were, and are, needed, but they have been abandoned.

It is a common belief among responsible politicians in this country that the concrete social problems of daily life in the cities of France and the dramatic problems of balance of payments in Great Britain are now converging to move public opinion in Europe against projects that contradict the elementary needs of the mass of the people. Ninety seven per cent of the population of France is not, in the least, concerned by the luxury of supersonic flying, but in anguish with the deterioration of urban life, the bankruptcy of public service in every city.

The European SST looks to us, on this side of the Atlantic, like an industrial Vietnam.

BO LUNDBERG
HOLBERGSGATAN 120
161 57 BROMMA
SWEDEN
TEL. 08/87 81 08

STATEMENT ON THE OPERATION ECONOMICS OF
CONCORDE AND THE BOEING SST PROJECT 2707

by
Bo Lundberg^{x)}

My recently concluded BL Report 145, "The Economics of Supersonic Transport Operation" describes a method for comparing the relation between the operation economics of SSTs and competing subsonics, and application on Concorde and the Boeing 2707. The report is in my opinion conclusive proof that these SST projects will be grossly uneconomical in operation because of their exceptionally high seat-mile cost. This will for the Boeing 2707 be 60 to 80 percent higher than for Boeing 747, and the seat-mile cost of Concorde will be at least 100 percent higher.

These results cannot be refuted by the SST proponents because my computations are based on information from Boeing and the manufacturers of Concorde about purchase price, payload, fuel consumption, and all other essential characteristics.

In view of this the following main conclusions of my report are also indisputable:

1. The SSTs can take over practically nothing of the - dominantly large - economy (tourist) class subsonic market, unless the airlines are to suffer ruinous losses by applying economy-class fares.
2. The SSTs can take over only a limited part of the small first class market (at close to first-class fares).
3. Such operation will yield returns on investment much less than for the subsonics, and this will result in either increase of subsonic fares or requirements of subsidies.
4. My report and these conclusions apply for the case of no sonic boom restrictions. If the SSTs are not allowed to fly at supersonic speed over inhabited land - which now seems practically certain - their operation economy will be even more inferior to that of the subsonics.
5. The computations in my report are based on the purchase prices that are estimated by the manufacturers on the assumption of many hundreds of SSTs being built (of the order \$ 50 million for the Boeing 2707 and \$ 25 to 30 million for Concorde). The diminutive market for the SSTs - only a part of the small first-class, over-ocean market - requires merely a few dozen Concordes or Boeing SSTs. These small series will result in production costs per aircraft at least twice as high as those assumed by the manufacturers for their estimates to the airlines of purchase prices. As the airlines most certainly will not pay much more for the SSTs than the price indicated by the manufacturers, the production will incur tremendous losses which must be covered by subsidies.

x) Aviation Consultant, former Director General of the Aeronautical Research Institute of Sweden. Member of the ICAO Sonic Boom Special Committee and the Swedish Government's

Senate foes on SST predict close vote

By William McGaffin
Of Our Washington Bureau

WASHINGTON — "Prox" and "Chuck," the bipartisan team that produced a 52-to-41 defeat of the supersonic transport project in the Senate Dec. 3, are back in action.

The two senators — Democrat William Proxmire of Wisconsin and Republican Charles H. Percy of Illinois — are working hard to defeat the SST again when the issue is put to a vote in the Senate late Wednesday.

But it's a much tougher operation this time because of the votes they lost with the shift of personnel in the new session of the Senate, and because of the intensified campaign by the Nixon administration, organized labor and contractors.

BOTH SENATORS said in interviews that the outcome will be "too close to predict."

Percy exhibited a tally sheet that showed 45 votes in favor of voting down the \$134 million appropriation for continuing construction of two prototypes of the 1,800-mile-an-hour airliner.

Forty-three other votes on his sheet were listed as unshakably supporting the appropriation. Two Senators were counted as being absent because of prolonged illness.

That left 10 as undecided. In general, Percy's role is to try to persuade Republicans to vote against the plane while Proxmire concentrates on the Democrats.

PROXMIRE hopes that the

House's 215-to-204 vote last Thursday to cut off funds will help the SST opponents in the Senate.

If the SST opponents lose in the Senate, however, they still will have another chance because of an agreement Proxmire has with the Senate leadership and the senior members of the Senate Appropriations Committee.

Under this agreement, there will be no attempt in a House-Senate conference to compromise the issue if the Senate votes for SST. Nor will the SST appropriation be lumped with the rest of the money for the Transportation Department.

Instead, the conferees will agree that there is a disagreement on the SST and will report back to both bodies for another vote. The SST issue will be kept separate from the rest of the Transportation Department appropriation so that an SST opponent can vote against it without also voting against money for airports, airport traffic controllers and other vital, noncontroversial projects.

A leading SST backer, Sen. Henry M. Jackson (D-Wash.), said Tuesday that if the Senate also votes against further funding of the supersonic transport: "It's dead."

Equal SST time

NEW YORK (UPI) — The Nixon administration, arguing that the Dick Cavett Show helped defeat the supersonic transport bill in the House by having SST opponents appear as guests, has sent its SST expert to New York to present its viewpoint on the air.

A spokesman for the Cavett show said executive producer John Gilroy received a telephone call from an aide to White House communications director Herbert G. Klein Friday complaining about the guests and suggesting that an administration spokesman appear on the show.

The call came the day after the House voted against further government funds for the SST.

"HE (THE AIDE) said they

felt the Cavett show was partly responsible for defeat of the SST in the House because throughout 1971 Cavett loaded his program with anti-SST people," the Cavett spokesman said.

"They suggested — and when the White House suggests it's more than just a suggestion — that we book (SST project manager William) Magruder on the show."

Magruder appeared on the ABC show Monday night. Sen. William Proxmire (D-Wis.), a leading opponent of the SST, originally was scheduled to appear on the show but did not.

An ABC spokesman said Cavett recently had on his show three SST opponents — Proxmire, Sen. Birch Bayh (D-Ind.) and Arthur Godfrey.



BARNEY K. HOWARD, president
JOHN G. TREZEVANT
executive vice president

MARSHALL FIELD, publisher
EMMETT DEWON
vice president, editorial director

JAMES F. HOGE JR., editor
KALIN O'NEILL, managing editor
ROBERT E. CONROY, associate editor
RUSS STEWART, vice president

LEO R. NEWCOMB, vice pres., general manager
GARY JOSEPH, vice pres., advertising-marketing
ALBERT E. VON ENTRESS, vice pres., circulation
WALTER C. BISHOP, vice pres., financial

Editorial Page

Mar. 21, 1971

Ugly facts of SST

The House of Representatives Thursday wisely voted to kill the super-sonic transport program. The action does not, however, assure the SST program will not be resurrected, since a similar measure is pending in the Senate. Such a bill if passed in the Senate still might possibly later pass the House. We hope the bill is defeated in the Senate. That program, for which the government already has put up \$865 million out of \$1,009 million spent, is a monster in conception and would be a monster in execution.

Its proponents were arguing for a government program which in effect would be for the benefit of an elite totaling perhaps one per cent of the United States population, who would use the swift plane to fly overseas. Proponents argued for a program which much evidence indicates would be a technological and ecological disaster. In our opinion the SST shows itself to be a classic example of the need to prevent science and technology from doing what it is unquestionably able to do. Proponents argued that not supporting the program would result in the loss of thousands of jobs when in fact most of those jobs do not yet exist and would not exist for 10 to 15 years.

The French and the British already have put \$2.4 billion into their joint Concorde SST program and they have far to go. What the Soviet program has cost is uncertain. For the United States not to await the results of those programs would be folly. Some men talk of "losing" the SST race. The greatest technological nation in the world certainly won't "lose" any such race. After World War II it was the British, not the Americans, who made the first major advancements in aircraft production. The United States learned and benefited and surpassed the British.

The House has voted nay on an aircraft which would produce a sonic boom of tremendous, shocking loudness, which cannot be flown over land, at least not where the victims can vote, and which takes off with a noise far greater than any present aircraft. Although the data obviously are not yet at hand, some of the nation's foremost scientists are convinced of the grievously harmful effect of the plane day in and day out on air, oceans and

Knock-in-the-night Nazi stuff

President Nixon has admirably come out against a section of a federal law which is obnoxious and smacks of totalitarianism. He favors repeal of a part of the Internal Security Act of 1950 under which a person may be detained in a national emergency if he is considered liable to commit espionage or sabotage. Six concentration camps were set up after the law was passed but never used.

A presidential spokesman called the

animals. Flying New York to Paris, for example, an SST would cover more than half the North Atlantic with sonic booms about every half-hour during peak summer traffic. It is possible that its vapor discharges into the thin air of the atmosphere would result in an increase in the amount of skin cancer-causing ultra-violet rays which reach Earth. As one critic put it, "It is Orwellian that men are prepared to take these risks, to manipulate mankind's only livable planet and its precious envelope of air for something so trivial as cutting the travel time to Paris by three hours."

Cities. Slums. Medical training and care. Education. One can construe a long list of where the money is more needed. Mass transportation is a prime candidate for aid. Unlike the SST with its relatively few riders, new Railpax train system will serve many people right off — 5 million the first year. According to Life magazine which opposed the SST, not only must rapid transit be built but bus service must be restored, yes, restored, to 174 small and medium sized cities in which public transportation, aside from cabs, has disappeared.

With respect to this, we agree with President Nixon's message to Congress urging a change in the law so that federal gas taxes can be used for purposes other than highways. He includes mass-transit in possible alternatives. We believe he is using far more imagination and much better judgment in this matter than he has in backing the SST.

There is no public demand for the SST and no social or human need could be met by it. A relatively few people and few companies would benefit. Voting for the SST would seem to be defying the soundest scientific and economic advice in the nation. SST would waste money and endanger the environment. An SST would seem to be technology for the sake of technology — letting the master technicians play with their dangerous toy.

Rep. Sidney R. Yates (D-Ill.), who led the fight in the House against the program, is to be commended for fighting the good fight. Our petition is that the ugly facts of the SST which sank home with him and his anti-SST colleagues will affect a majority of the Senate the same way.

section "extremely offensive to many Americans." That's mild. The law means one can be punished on the mere basis of suspicion; has no guarantee of trial; is presumed guilty; that the person may not be told why he was picked up, and that the government need not produce evidence. This part of the 1950 law is a bit of knock-in-the-night Nazi stuff. It is un-American. Repeal will be considered in this session of Congress and should be voted.



Emrick

1971, CHICAGO SUN-TIMES

"Who said you could cook?"

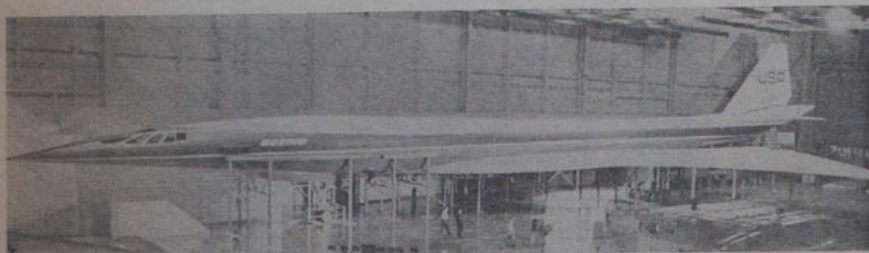
SNOW?
Mostly cloudy Thursday with a high in 30s.
Details on Page 132.

CHICAGO Sun-Times

**★ FINAL
MARKETS**
160 Pages - 10 Cents

Vol. 51, No. 43 © 1971 by Paul Enterprises Inc.

Thursday, March 25, 1971



The Boeing supersonic transport plane at Seattle. (AP)

Senate rejects SST

51-46 vote bars more federal aid



War is a weary business, as these pictures of an American soldier (left) and a South Vietnamese soldier indicate. Both have been relieved temporarily. The Yank is a member of an armored unit that was trying to break through to besieged U.S. and South Vietnamese troops near the Laos border. The exhausted South Vietnamese spent six weeks fighting inside Laos. (AP and UPI)

South Viets leave Laos under hot pursuit by Reds

Stories, picture on Page 2

Digitized by the Hunt Institute for Botanical Documentation

From Sun-Times Wires

WASHINGTON — The Senate voted Wednesday to bar any more federal spending on development of the supersonic transport plane. The vote was 51 to 46.

The decision signaled the end of government financing of research for the 1,500-mile-an-hour airplane as of March 30.

The House voted down the request 215 to 204 last week, saying in effect the plane should be built by private industry or not at all.

When current appropriations run out March 30, the government will have spent \$566 million of a projected \$1.3 billion to help Boeing Co. and General Electric build the prototypes. Senate Republican Leader Hugh Scott of Pennsylvania restated President Nixon's firm commitment to the SST, and said the White House has kept up pressure on fence-sitting senators "in every way available."

Scott commented: "Two or three people are going through the tortures of the damned." Mr. Nixon met at the White House in the

morning for 20 minutes each with three senators already publicly committed against the SST and one Republican who has been uncommitted among the undecided.

The uncommitted

Sen. Peter Dominic (R-Colo.), who was listed as an opponent but did no vote when the Senate rejected SST funds 52 to 41 last December, was a key uncommitted senator before the voting began. The other senators were Clifford Hansen (R-Wyo.), Jack Miller (R-Iowa) and Harry F. Byrd Jr. (Ind.-Va.).

Only a handful of senators appeared on the floor during most of the day's debate.

Scott told newsmen before the session began that 13,000 workers "could get their lay-off slips immediately" with thousands more losing jobs later if the project were killed.

Sen. Warren G. Magnuson (D-Wash.), who represents Boeing's home state, said the moment of decision had arrived not only for the SST but "in a larger sense for this nation's entire attitude toward the advancement of technology."

Magnuson and other SST backers rejected as unproven the arguments that the SST would damage the environment, cause unbearable noise, lead to a possible increase in skin cancer and be an economic fiasco.

Muskie speaks against

Sen. Edmund Muskie (D-Me.), said Congress was being asked to spend millions of dollars to reduce trans-Atlantic flight by three hours "even though the plane to be built might cause severe damage to our environment and may never be able to operate profitably."

Both Illinois senators, Adlai E. Stevenson III (D) and Charles H. Percy (R) voted against the SST.

ALLEN J. ELLENDER, CHAIRMAN
JOHN L. MCCLELLAN, ARR.
WARREN G. MAGNUSON, WASH.
JOHN C. STENNIS, MISS.
JOHN G. PASTORE, N.J.
ALAN BIBLE, NEV.
ROBERT C. BYRD, W. VA.
SALE W. MC GEE, WYO.
MIKE MANSFIELD, MONT.
WILLIAM PROXMIRE, WIS.
JOSEPH M. MONTOYA, N. MEX.
DANIEL K. INOUE, HAWAII
ERNEST F. HOLLINGS, S.C.

THOMAS J. SCOTT, CHIEF CLERK
WM. W. WOODRUFF, COUNSEL

MILTON R. YOUNG, N. DAK.
KARL E. MUNDT, S. DAK.
MARGARET CHASE SMITH, MAINE
ROMAN L. HRUSKA, NEBR.
GORDON ALLOTT, COLO.
NORRIS COTTON, N.H.
CLIFFORD P. CASE, N.J.
HIRAM L. FONG, HAWAII
J. CALDER RODGERS, DEL.
CHARLES H. PENCE, ILL.
EDWARD W. BROOKE, MASS.

United States Senate

COMMITTEE ON APPROPRIATIONS
WASHINGTON, D.C. 20510

March 18, 1971

Mr. George B. Van Schaack
4 S 111 Lincoln Lane
Lisle, Illinois 60532

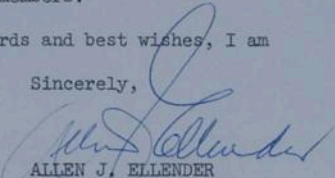
Dear Mr. Van Schaack:

This will acknowledge and thank you for your letter of March 16, which was also signed by many of your friends, stating your opposition to the full appropriation request for the supersonic transport.

I appreciate having the benefit of your observations and assure you they will receive every consideration. In addition, I am forwarding your letter to the Subcommittee on the Department of Transportation and Related Agencies, under whose jurisdiction this appropriation request falls, for the information and consideration of its members.

With kindest regards and best wishes, I am

Sincerely,


ALLEN J. ELLENDER
Chairman

AJE:Sk

Dear Senator:

I strongly urge you to STOP THE SSTs -- because they would:

Inflict jolting sonic booms on a large fraction of the earth, night and day.
Startle as many as 20,000,000 people per transcontinental flight.

(Note: the FAA still has not banned SST supersonic flight over land.)

Convert the oceans into sonic boom dumping grounds.

Create intolerable noise at airports and in nearby suburbs.

Expose passengers to dangers from lightning, flash-fire, sudden loss of
cabin pressure, ozone, cosmic rays.

Require multi-billion-dollar subsidy by the taxpayers.

Become a gigantic financial failure -- because it would be far outclassed
by the 747 Jumbo Jet. (The 747 has 50% greater capacity, 50% greater
range, is much roomier and safer, costs 50% less, has much lower fares,
requires no subsidy by the taxpayers, and has no sonic boom.)

Why spend billions of dollars to develop an SST that is already doomed? - That
nobody needs? - That the airlines cannot afford? - That creates vast problems
for the environment while solving none for transportation?

PLEASE STOP THE SSTs.

Signed _____

Address _____

Fastest white elephant

To build or not to build the SST: The question requires an answer from Congress by the end of the month, for the funding of the supersonic transport runs out then. Last year, Congress grudgingly agreed to a three-month extension into 1971, and then only because the issue had become so hot it interfered with adjournment.

It's still hot, and the vote is likely to be close. But as more evidence piles up in Senate hearings, it reinforces our opinion that no more public money should be spent on the SST.

It isn't good enough to say that we might as well go ahead and build two prototypes of the plane in order to find out how much they would pollute the air with gas and noise, and whether they could operate economically. Even if the pollution factors are minimized — and the administration has gone to great lengths to minimize them — the odds against economic success for this venture are mounting.

Actually, there's no separating the environmental and economic aspects, for it's the sonic boom — only one of the environmental drawbacks — that rules out the prospect that the SST can be a money maker. If it can't fly faster than sound except over water and frozen wastes, then it loses its chief reason for being, which is superspeed. The time saved in transoceanic flights would be too little to justify the enormous extra cost.

The aircraft industry has of course led the fight to build the SST, but the hard-pressed airlines themselves concede they can't see the day when they could afford to buy and operate them. Their problem now is an oversupply of space for passengers in their new generation of jumbo subsonic jets. Air travel will doubtless resume its growth in the future, but it could be a long, long time before there is any demand for a plane that carries fewer passengers at a much higher cost. And by that time, perhaps the air transport industry can finance its own development instead of depending on the public to do it.

By the way, it is not the impending fuel shortage that may clinch the argument

against the SST as the least efficient form of mass transportation known to man. Recent studies have shown that in terms of people or cargo hauled per mile per gallon of fuel, the SST is in a wasteful league all its own. It would carry only 13.6 passengers per mile per gallon, compared with 22 for the jumbo Boeing 747 (and compared with 200 for a double-deck passenger train).

So enormous is the SST's appetite for fuel that if the government's dream is realized and 500 of them are in the air by 1990, the fleet would consume 40 billion gallons a year. A little more than a decade ago, all forms of transportation in the United States put together used not much more than that in a year.

The more that is learned about the SST, the less attractive it becomes from any angle. The thing to do, it seems to us, is to put it on the shelf and study it, at least for a while, rather than sink more money into what could be the fastest white elephant in the world.

Citizen Lee

Virginia's Sen. Harry F. Byrd Jr. has discovered that the Union never did restore citizenship to Gen. Robert E. Lee, commander of the Confederate forces, and he thinks it's time justice was done. Byrd says Lee signed a required oath of allegiance after the Civil War ended, but somehow it never reached President Andrew Johnson.



Gen. Lee

It shouldn't be hard to get the two-thirds vote needed in Senate and House to pass Byrd's resolution. Resentment against the gentlemanly insurgent should have vanished long ago. And alas for Lee, citizenship won't have much practical advantage. It's too late for him to vote anywhere, unless it's in Chicago.



Strictly personal

Questions key

By Sydney J. Harris

Recently, I received a letter from George Gallup, head of the American Institute of Public Opinion, advising that he is at work on a book that "will try to describe and explain polling methods." He asked me to write down any questions I might have about any aspect of polling.

Well, whenever I hear the results of some public opinion poll, I am always more interested in how the questions were framed than in how the answers turned out. Any question can be framed — consciously or unconsciously — to elicit the kind of answer it wants or expects.

I could easily devise two political polls of five questions each, one designed to elicit the answer that the country is drifting rightward, and the other to elicit an equally leftward drift. No trouble at all.

At a college, not long ago, a professor of logic submitted a list of 10 questions to his classes; a large majority answered affirmatively to eight of them — which happened to be the 10 propositions in Marx's "Communist Manifesto." Then he rephrased the questions, and just as many opposed them. Both times, they were responding to words more than to ideas.

TWO WORDS MAY denote the same thing, but connote different things. Most people do



Harris

80-year-old gra

I am 80 years old and consid-

United States Senate

COMMITTEE ON
LABOR AND PUBLIC WELFARE
WASHINGTON, D.C. 20510
OFFICIAL BUSINESS

Mr. George B. Vanshaack
Morton Arboretum
Lisle, Illinois



U. S. S.

John Gardner

David R. Brower

Pres. Richard Nixon

Senator Percy

" Stevenson

Ray Fashery

Hugh Elliot

Shurcliff

Spencer St. Gates

Solicit

Evans (La)

Kudach's (Ohio)

Members (Calif)

Ellis (N.H.)

George Wald

Ray Fashery

(D.C.)

New York Times
 Saturday Rev
 Chicago Tribune
 Chicago Daily News
 Nation
 Progressive
 Science

Horace
 Bio-Science
 St. Louis
 Cleveland P.W.
 San Fran. Chron.
 Fortune

Send copies to Ark for signatures ^{to be} on the copy and its verso, ^{to be} returned before March 30, plus a contribution to expense

Cost = 4500 ± × 13-194
 58,50 - 84,00

225 ± × 13-194
 28,35 - 43,75
 Houlder

the false witness who accailed you
singly and in force in your office
and in the corridors of the Capitol.

The first battle is won. Our old adversary
is unafraid, and he will not yield after a
single defeat. His newest lobby, set up only
a few weeks ago, has an unassuming but self-
shame in the aeronautical part. You have
already voted against the pleading of
this lobby and are aware of its impractical
aim. We urge you to continue to
combat it and to make ^{known} its self-seeking
and partisan character.

Our most sincere congratulations go
to all of you. We look forward
to finding you ^{in the future} in support of the many
actions which will be required to bring
about a renewed ^{human} environment for
this great country.

LINDBERGH AND THE SST

Congressman Sidney R. Yates of Illinois has made public a letter he received from aviator Charles A. Lindbergh in which Lindbergh says the SST should not be built.

Lindbergh, who is a member of the Board of Directors of Pan American World Airways which holds an option to buy 15 of the supersonic transports, speaks out in the face of an otherwise united industry front that says the SST must be built.

The Lindbergh letter comes just as the Nixon Administration and other pro-SST forces are gearing up for a lobbying blitz to ramrod the supersonic transport through the Congress once again. By the terms of a compromise with Senator William Proxmire of Wisconsin in December, the SST must come up for a vote by the end of March 1971.

There are also reports that labor unions, neutral on the national level, are working behind the scenes at home to pressure pro-SST votes from their Senators and Representatives. Locals of the International Association of Machinists are apparently leading the pro-SST activity. National unions opposing the SST to date are the International Longshoremen's and Warehousemen's Union, the National Federation of Social Service Employees and the Oil, Chemical and Atomic Workers' International Union.

The text of Lindbergh's letter follows:

Darien, Connecticut
February 3, 1971

Dear Congressman Yates:

Replying to your letter of January 20th, my impression is that the supersonic transport is within the state of the art technically but not economically or environmentally. Seat-mile costs are too high, and the pollution of the upper atmosphere too dangerous on the basis of present knowledge. I believe it would be a mistake to become committed to a multi-billion dollar supersonic transport program without reasonable certainty that SST's will be practical economically and acceptable environmentally.

I do not now see any practical way to avoid the disturbance that would be caused by regular sonic booms. As a citizen, I feel we are already subjected to more than enough technological noises, and my vote will be against adding to the present noise level in any unnecessary way. I do not accept as practical or lasting the idea that supersonic transports would be flown at supersonic speeds only over water. . . .

Sincerely,

/s/ Charles A. Lindbergh

Hon. Sidney R. Yates
House of Representatives
Washington, D.C.

Lisle, Illinois 60532
March 16, 1971

United States Senate Committee on Appropriations
Senate Office Building
Washington, D. C.

Dear Sirs:

We urge you to disapprove United States Government funding of SST prototypes, now under your consideration. We must believe you have heard all the reasons advanced for the support of each side, and we do believe that your decision ought to be based on relevant facts. We submit that relevant facts are of a non-political nature, on the one hand, and selfless as to economic advantage on the other.

You have recently been assailed by a new lobby, National Committee for an American SST, whose full-page advertisements of last week ask approval of the SST prototypes on the basis of very questionably sound principles: nationalism (irrelevant), less pollution than the Russian model (all very high energy transportation pollutes, essentially by definition of the word), 12 years of past effort (only the unwise throw good money after bad), establishment of a revenue tax base of \$7 billion (pulling oneself up by one's bootstraps is yet to be demonstrated as feasible, and, in addition, loss of property values from SST pollution would greatly exceed \$7 billion), enormous export sales (in pure economics every exported item contributes to a depletion of resources).

Moreover, the membership of this lobby would seem to be exclusively airplane manufacturers, airlines, and some thirty national unions. The more powerful of the airplane-connected members are bidding for large money gains; some, at least, of the less powerful unions, such as the Retail Clerks of America, can only have followed suit after the lead of the wolves.

Let Russia launch its planes, and so too England and France, and let the loss be theirs, rather than that of the enormously large percentage of all Americans who would never have even the fare to pay to ride one of the proposed monster polluters.

Lisle, Illinois 60532
March 16, 1971

United States Senate Committee on Appropriations
Senate Office Building
Washington, D. C.

Dear Sirs:

We urge you to disapprove United States Government funding of SST prototypes, now under your consideration. We must believe you have heard all the reasons advanced for the support of each side, and we do believe that your decision ought to be based on relevant facts. We submit that relevant facts are of a non-political nature, on the one hand, and selfless as to economic advantage on the other.

You have recently been assailed by a new lobby, National Committee for an American SST, whose full-page advertisements of last week ask approval of the SST prototypes on the basis of very questionably sound principles: nationalism (irrelevant), less pollution than the Russian model (all very high energy transportation pollutes, essentially by definition of the word), 12 years of past effort (only the unwise throw good money after bad), establishment of a revenue tax base of \$7 billion (pulling oneself up by one's bootstraps is yet to be demonstrated as feasible, and, in addition, loss of property values from SST pollution would greatly exceed \$7 billion), enormous export sales (in pure economics every exported item contributes to a depletion of resources).

Moreover, the membership of this lobby would seem to be exclusively airplane manufacturers, airlines, and some thirty national unions. The more powerful of the airplane-connected members are bidding for large money gains; some, at least, of the less powerful unions, such as the Retail Clerks of America, can only have followed suit after the lead of the wolves.

Let Russia launch its planes, and so too England and France, and let the loss be theirs, rather than that of the enormously large percentage of all Americans who would never have even the fare to pay to ride one of the proposed monster polluters.

...the best that ruble



On October 23, 1971, commercial SST service will begin. The Supersonic Transport shown above will initiate flights between Calcutta and Moscow. The SSTs involved will carry the colors of The Soviet Union.

This announcement by the Soviets comes at a time when both the British and French are well along on their SST programs, too. The British and French have flown their prototype SSTs.

Here in The United States, we have an American SST under development. It's not flying yet. And if it were up to some people, it never will. But it's a better airplane than either

the Russian Tu-144 or the British French Concorde.

It's faster. It's bigger. It's more efficient. And it's more pollution-free.

Government and industry have already invested 12 years of hard work and many dollars in the American SST. We're ready to build and test two prototypes—to make an airplane as effective as permitted by the capabilities of American technology. Scientific studies indicate that our SSTs will not be harmful. In fact, they will establish new environmental standards which foreign SSTs would have to match. What's more, the American SSTs will provide jobs for 150,000 American workers. All over the country.

It will establish a revenue base worth up to \$7 billion. End

American Labor and Industry for

MEMBER: NATIONAL COMMITTEE FOR AN AMERICAN SST

1156 15th STREET, N.W., SUITE 600, WASHINGTON, D.C. 20005. TELEPHONE: (202) 223-8000. FLOYD E. SMITH, LABOR CHAIRMAN. DO

at rubles could buy.

ussian Tu-144 or the British-Concorde.

s faster. It's bigger. It's more t. And it's more pollution-free. Government and industry have y invested 12 years of hard nd many dollars in the Ameri- SST. We're ready to build and vo prototypes—to make this e as effective as permitted by pabilities of American tech- r. Scientific studies indicate ur SSTs will not be harmful. t, they will establish new enmental standards which the SSTs would have to match. s more, the American SST will e jobs for 150,000 American s. All over the country.

will establish a revenue tax orth up to \$7 billion. Enough

to help fund many of our high-priority social and urban programs. It will produce export sales to foreign airlines of up to \$10 billion, to help our balance of payments.

Perhaps more important, the American SST will keep world aviation leadership here in America. Plus provide a base for technological advancements in many fields of applied science.

America needs to build those two prototypes. Now.

If you believe that American dollars can compete with Soviet rubles, write or wire your Congressman today. Urge support for America's SST.

Industry for the SST



COO. FLOYD E. SMITH, LABOR CHAIRMAN. DONALD J. STRAIT, INDUSTRY CHAIRMAN.



THE MORTON ARBORETUM

Joy Morton, founder

LISLE, ILLINOIS 60532 Phone: WOODLAND 8-0074

March 23, 1971

Dr. William A. Shurcliff
Cambridge Electron Accelerator
Harvard University
Cambridge, Mass. 02138

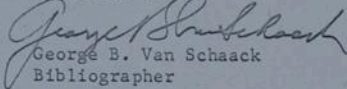
Dear Dr. Shurcliff,

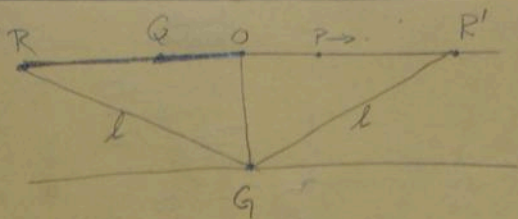
There are so many who should receive congratulations I scarcely know to whom to send mine. I select you as outstanding in your effort and, I blush to say, in my own belief that the thing could be stopped.

I rejoice with you, even though I can't believe the 'battle' is won. For the SST was (or still is?) only one of its thousands of battlefields, as you well know.

This victory can be a turning point in history, but only if we go forward to attack the enemy in many of his other strongholds.

Sincerely yours


George B. Van Schaack
Bibliographer



$$\text{time for } \lambda = \frac{nl}{\sqrt{n^2-1}}, \quad OQ = \sqrt{\frac{n^2 l^2}{n^2-1} - l^2}$$

$$= \frac{l}{\sqrt{n^2-1}}$$

$$\frac{OQ}{OR} = \frac{l}{\sqrt{n^2-1}} \cdot \frac{n^2-1}{2nl} = \frac{\sqrt{n^2-1}}{2n}$$

$$n \approx 2 \quad \approx \frac{\sqrt{3}}{4} = .216$$

$\frac{4.96}{1000}$

$$.02 \text{ in} = .02 (2.54) \text{ cm}$$

$$\approx .0508 \text{ cm}$$

$$= .508 \text{ mm}$$

East Cliff. Near Car. 2
with Howard
300 M St. S.W.
A.N. 609.
Washington D.C.
20020
90049 63139
202-554-3730

In $x > 0$ inverse tan $\tau = \frac{\lambda}{s} + \frac{\sqrt{\lambda^2 - h^2}}{hs}$

$$s \tau' = 1 + \frac{1}{h} \frac{\lambda}{\sqrt{\lambda^2 - h^2}} > 0$$

$$R: x = \sqrt{h^2 - h^2} = \sqrt{\left(\frac{n^2+1}{n^2-1}\right)^2 h^2 - h^2} = \frac{h}{n^2-1}$$

i.e. $\lambda = \frac{n^2+1}{n^2-1} h$ and substitute τ

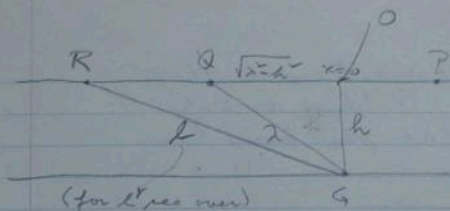
$$\begin{aligned} \tau &= \frac{\frac{n^2+1}{n^2-1} h}{s} + \frac{\sqrt{\left(\frac{n^2+1}{n^2-1}\right)^2 h^2 - h^2}}{hs} = \frac{n^2+1}{n^2-1} \frac{h}{s} + \frac{h}{hs} \frac{2h}{(n^2-1)} \\ &= \frac{h(n^2+3)}{s(n^2-1)} \end{aligned}$$

$$n=2 \quad \tau = \frac{h}{s} \frac{7}{3} = 2.333 \frac{h}{s}$$

For relief printing the final
plate must be dark where printing
is desired.

For ordinary printing the final
plate must be dark where printing
is not desired.

$$\begin{array}{r} 72 \\ \hline 7.2 \end{array} = 10 \quad 9$$



P plane on x axis
plane speed v , $x > 1$
 $x = 0, t = 0$

$$\text{Part (b) } t = \frac{\sqrt{x^2 + h^2}}{v}$$

Energy from $x = 0$ reaches G at $t = \frac{h}{v}$

Energy from Q: $x = \sqrt{x^2 + h^2}$ reaches G at $t = \frac{x}{v} + \frac{\sqrt{x^2 + h^2}}{v}$

We wish to minimize $t = f(x)$

$$t' = 1 - \frac{1}{v} \cdot \frac{x}{\sqrt{x^2 + h^2}} = 0$$

$$\frac{x}{\sqrt{x^2 + h^2}} = v$$

$$x^2 = v^2(x^2 + h^2)$$

$$x = \frac{v^2 h^2}{v^2 - 1} \rightarrow x = \frac{vh^2}{\sqrt{v^2 - 1}}$$

$$t'' = -\frac{1}{v} \frac{v^2 h^2 - x^2}{(x^2 + h^2)^{3/2}} = -\frac{1}{v} \frac{v^2 h^2 - v^2 h^2}{(v^2 h^2)^{3/2}} > 0$$

$t'' > 0 \therefore x = \frac{vh^2}{\sqrt{v^2 - 1}}$ gives minimum.

$$\begin{aligned} \text{And } t_{\min} &= \frac{vh^2}{v\sqrt{v^2 - 1}} + \frac{\sqrt{\frac{v^2 h^4}{v^2 - 1} + h^2}}{v} \\ &= \frac{vh^2}{v\sqrt{v^2 - 1}} + \frac{vh^2}{v\sqrt{v^2 - 1}} \\ &= \frac{vh^2}{v} \left(\frac{1}{\sqrt{v^2 - 1}} + \frac{1}{v\sqrt{v^2 - 1}} \right) \\ &= \frac{vh^2}{v\sqrt{v^2 - 1}} \cdot \frac{v^2 - 1}{v^2} = \frac{h\sqrt{v^2 - 1}}{v} \end{aligned}$$

Earliest time is only $\frac{h}{v} - \frac{h}{v} \frac{\sqrt{v^2 - 1}}{v} = \frac{h}{v} \left(\frac{v - \sqrt{v^2 - 1}}{v} \right)$ before energy

R (which determines h) is defined as that point on the back of P from which energy reaches G at the same time as from O. Hence

$$\frac{h}{s} = \frac{h}{s} + \frac{\sqrt{h^2 - h^2}}{r^2}$$

or, $h = h$ or

$$h = \frac{r^2 + 1}{r^2 - 1} h$$

So all energy for flight from R to O
arrives in a time interval of length

$$\frac{h}{5} \left(1 - \sqrt{1 - \frac{1}{n^2}}\right)$$

If $n=2$ this time interval is $\frac{h}{5} \left(1 - \frac{1}{2}\sqrt{3}\right)$

$$= \frac{h}{5} (1 - .866) = .134 \frac{h}{5}$$

$$= .000134 \text{ h sec if } h \text{ in ft.}$$

If $h = 5000 \text{ ft}$ this interval = .67 sec.

$$\text{Now } RO = \sqrt{L^2 - h^2} = \sqrt{\left(\frac{n^2+1}{n^2-1}\right)^2 h^2 - h^2}$$

$$= h \sqrt{\frac{(n^2+1)^2 - (n^2-1)^2}{(n^2-1)^2}}$$

$$= \frac{h \cdot 2n}{n^2-1}$$

For $n=2$ $RO = h \cdot \frac{4}{3}$ and $h = 5000$, $RO = 6667 \text{ ft}$
(i.e. plane moves for 3/4 sec)

All the energy which reaches G and is sent during its passage
on $RO \left(= \frac{2nh}{n^2-1}\right)$ reaches G during the time interval

$$\frac{h}{5} \left(1 - \sqrt{1 - \frac{1}{n^2}}\right).$$