



Boeing Aircraft

## The SST defeat: Symbol of a new awareness

The demise of the American supersonic transport may mark the beginning of a new and more sophisticated phase of the industrial revolution. Prior to votes in the Senate last week, and in the House the week before, to refuse further funds to develop two prototype SST's, supporters had used the argument that mankind has never rejected a new technology, be it James Watt's steam engine or the atomic bomb. Now the world's major industrial nation has established a new precedent: If a new technology is judged to be potentially harmful to the environment or low on an increasingly humanistic scale of priorities, then its development with public funds can be halted.

On the other hand, many observers are saying that the motivations of the decision in Congress are by no means all that clear-cut. And, indeed, a clear reading of Congressional intent was obscured by a variety of political and economic issues. Eighty-five House Republicans voted against the SST (and 89 for it), a reflection, some writers speculated, of increasing Republican disillusionment with President Nixon, particularly his Indochina policies. Without doubt, cost-benefit analyses by such prominent economists as Joseph Heller and Paul Samuelson puncturing the SST proponents' claim the aircraft would be a great balance-of-payments boost to the United States played a major part in the decisions of many Congressmen voting against the SST.

But whatever the impact of these issues, mail to Congressmen was heavily against the SST. This, finally, was what enabled—or compelled—many to vote against the giant aircraft, even in the face of immense lobbying pressures from the Administration, labor unions and industry.

"About half of our overwhelmingly anti-SST mail expressed a concern with the environment," says one House aide.

But this was by no means the only reason for opposition. "Another third of the people writing were concerned with national priorities, with putting the money into the slums instead of into a plaything for the rich."

Another significantly large group of letter writers identified the SST with the Pentagon and the military-industrial complex. "The anti-Pentagon feeling in our [Midwestern] district is 10 times what it was 18 months ago," says the aide. "The SST was tarred with the same brush."

Those who wrote in favor of the SST, he adds, were primarily well-to-do businessmen—the same people, presumably, who would be passengers on the giant aircraft if it ever went into commercial service. Many of those opposing it, in addition to mentioning the environmental and national priority issues, took a strong stand against further Federal subsidies to a private industry. "Their position was that if the SST were indeed a good thing, then industry could foot the bill."

The heavy anti-SST mail, combined with the new House rule requiring Congressmen to go on the record in teller votes, contributed heavily to the death of the SST. It can be argued that this really means that Congress is beginning to reflect the sentiments of the people at the grassroots in unprecedented ways. SST supporters contended that this is a new kind of swift and dangerous transmission of mass emotionalism to the decision-making legislative bodies, an argument not altogether invalid if the anti-Pentagon views, for instance, had a major role in defeating the strictly non-military SST. But jubilant SST opponents maintained that after decades of subservience to technological and military monoliths, Congress finally was reflecting the real wisdom of the people.

James Weeks, a specialist in science and public policy at the Washington,

D.C. Institute for Policy Studies, who did a study on the SST, says the vote in good part reflects a public disillusionment with the argument of "the logical next step," a belief that what is technologically possible should automatically be done. Studies, such as one by Arthur D. Little Inc., indicate, he says, that the aerospace industry has facilities and personnel it must employ in order to keep itself viable, without reference to real transportation needs. "The vote is a clear snipe," he says, "at welfare programs for what people see as the super-rich jet-set aerospace complex."

But what gave SST opponents great public visibility were the environmental issues. Oddly enough, these issues were some of the least clear-drawn of all those involved in the SST debate. Perhaps the most authoritative study was done last summer by a Massachusetts Institute of Technology-based group called Study of Critical Environmental Problems (SCEP). Their conclusion was that a large fleet of SST's would pose environmental hazards from sulfur oxides and water vapor released at high altitudes where the contaminants would remain for long periods. But SCEP officials pointed out that the long-term global effects of these contaminants were unknown (SN: 12/12/70, p. 444).

Thus, insofar as the anti-SST vote reflected environmental concerns, here, too, was a departure: If there is a question of environmental damage, but no absolute proof, then a halt may be justified. The burden of proof has been shifted to the developers.

So although there were many reasons for the defeat of the SST, they all represent some degree of a new public dubiousness about institutions that not long ago were nearly sacrosanct. Some attribute this to a dissipation of "pluralistic ignorance," the phrase psychologists use to describe a willingness

to give lip service to something one does not really believe in on the mistaken assumption that everyone else believes in it. Environmentalism is often the vehicle of this dissipation nowadays. Suddenly the unthinkable becomes thinkable, the unsayable sayable.

**There is no doubt** the death of the SST will cause profound economic dislocations, especially in the Seattle area where Boeing Aircraft Co. was constructing the two prototypes. After spending \$864 million on the project, the Government cut off all further funds on Tuesday. Some 14,000 workers—7,000 in Seattle—were almost immediately put out of work, and more will follow. The Seattle unemployment problem sharply points up the great difficulties involved in accomplishing shifts in national priorities, and Sen. Edmund Muskie (D-Me.), who voted against the SST, quickly introduced a bill that would authorize \$100 million for research and development in urban mass transit and aviation safety, much of the new R&D to be done by the displaced aerospace workers. □

#### PROSTAGLANDINS

### Rapid research advances

Since the New York Academy of Sciences' symposium on prostaglandins last fall (SN: 10/10/70, p. 306), research on this family of hormone-like substances has continued at an accelerated pace. Another milestone in this work was reported last week in Los Angeles at the annual meeting of the American Chemical Society. Dr. Elias J. Corey of Harvard University announced that the remaining two (PGE3 and PGF4 alpha) of the six parent prostaglandins have been synthesized by a simplified process that will make large-scale commercial production possible.

**With this advance** there will be an accessible supply of the drugs, and research will be able to continue at an even greater rate. To date prostaglandin research has covered a variety of fields. In the United States prostaglandins have been used successfully to induce more than 450 abortions. In Sweden, Britain and Uganda 200 women are using prostaglandins (instead of contraceptives) to induce abortion as soon as they miss a period. It is also possible that these drugs can be used to induce labor, treat male sterility, relieve high blood pressure, treat peptic ulcers and treat asthma.

Researchers say that the possibilities are great, but the work is still in the preliminary stages. The effects of the drugs must be tested on many more subjects before they can be considered safe for general use. □

#### GROWTH HORMONE

### Revising the sequence

For 15 years Dr. C. H. Li has been studying the chemistry of human growth hormone (HGH). He was first to isolate and purify it in 1956, and in 1966 he reported what was thought to be the primary amino acid structure of it. Since then he has worked on synthesis of the hormone.

Early this year (SN: 1/16/71, p. 41) Dr. Li, director of the University of California's hormone research laboratory in San Francisco, and his associates announced success in the synthesis of a protein based on his previously reported primary structure for HGH. Laboratory tests showed that the synthetic material possessed both the growth promoting and lactogenic properties of HGH.

**The scientific world** applauded his work as a monumental accomplishment in the field of polypeptide chemistry. He had succeeded in constructing a complex protein with a molecular weight of about 21,500, consisting of 188 amino acid residues. Prior to this the largest manmade protein was ribonuclease (124 amino acids), synthesized in 1969 (SN: 2/1/69, p. 112).

More than an achievement in chemistry, Dr. Li had opened up the field of HGH research by making possible the production of a biologically active substance (though only 10 percent as active as natural HGH) with which researchers could study the various influences of HGH and gain a broader understanding of its active portions.

HGH is one of the polypeptides secreted by the pituitary gland. Other members of this same group of hormones are ovine prolactin (OP), secreted by sheep pituitary glands, and human chorionic somatomammotropin (HCS). Physiological and immunological criteria suggest that all three species are structurally related and, therefore, should possess much the same amino acid sequences.

**Dr. Hugh D. Niall** of the endocrine unit at Massachusetts General Hospital in Boston, and his colleagues, have determined much of the amino acid sequence of HCS, and, as expected, there is considerable similarity between HCS and OP. However, Dr. Niall reports in the March 17 NATURE NEW BIOLOGY that the similarity between HGH and HCS stops after residue 16.

Dr. Niall noticed, however, that the group of amino acids starting at 32 in HGH was similar to another group starting at 17 in HCS. Feeling that perhaps Dr. Li had transposed two major segments of the molecule, Dr. Niall rearranged the segments and checked his findings against the structure of



Univ. of Calif.

*Dr. Li: Hopes to clarify confusion.*

HCS. Now the expected similarity was evident. By adding two more amino acids to the structure, Dr. Niall produced what he believes to be the true primary structure for HGH.

If his proposed structure for HCS is correct then Dr. Li's basic structure for HGH is incorrect, and Dr. Li will have spent the past 15 years working on the synthesis of a substance that is not what he believed it to be.

"In the absence of any direct evidence, however, this suggestion must remain tentative," Dr. Niall's report states. But since submitting his paper, he says he has found what he considers to be direct evidence. He intends to publish these findings within the next three weeks.

**Meanwhile**, in California, Dr. Li has not been wasting his time. He has determined the full amino acid structure for HCS and has accordingly revised his basic structure for HGH. And, he said this week, not only has he proposed a revised structure, he has synthesized another HGH-like substance based on this revised structure.

Dr. Li says he is aware of Dr. Niall's work and believes that he knows what Dr. Niall intends to propose in his forthcoming paper. But, having already synthesized HGH according to his revised primary structure, and having found it to be more active than the previous synthesis, Dr. Li contends his is the correct sequence and that it will vary slightly from what Dr. Niall intends to publish.

The fact that an active HGH-like substance has been synthesized is what really matters in this controversy, but a correct structure for the hormone should be presented in order to develop the research to its fullest potential. Dr. Li's work is in preparation and is due to be published in five or six weeks (shortly after Dr. Niall's). Dr. Li states that his own findings will be conclusive enough to straighten out the existing confusion. □