

is about three-hundredths second; the quasar's 30 million seconds. The pulsar's mass is less than that of the sun; the quasar's a few billion times the sun. The pulsar's spin should last about 3,000 years; the quasar's 30 million.

Dr. Morrison suggests that there may exist a whole series of objects with this kind of central, condensed, spinning magnetic mass, that differ in size and scale. The sequence could include active galactic nuclei, the nuclei of Seyfert galaxies, compact and N-type galaxies, and the radio-silent quasistellar objects (SN: 5/9/66, p. 245), in addition to quasars and pulsars.

## SUPERSONIC TRANSPORT

### Moving at last

Like a hesitant bather, the Nixon Administration has finally decided to get into the water. Overriding chilling objections of pressing social needs and sonic boom, President Nixon this week gave the go-ahead for construction of two prototypes of the \$4.5 billion supersonic transport. Able to hold 300 passengers and fly at 1,800 miles an hour, the SST is to be built by the Boeing Co.

After battling around a number of plans for financing the plane (SN: 5/17, p. 473), the Administration finally settled on the old expedient of simply asking Congress for the money—about \$662 million (plus a \$99 million carryover) for the next five years. The President wants \$96 million for this fiscal year and about \$600 million to complete two prototypes by 1972. More than \$500 million in Federal funds have already been spent on the project, and the total Government contribution is expected to hit \$1.3 billion.

The SST is not expected to be in full operation until 1978, several years behind the British, French and Russians, who are already testing their SST's.

The Nixon decision was, in part, prompted by their lead. "I want the United States to lead the world in air transport," the President has declared.

Aside from the objection that the money would be better spent on social problems, sonic boom is the most-hurled argument against the SST. Until it is overcome, declared Secretary of Transportation John A. Volpe, the SST will be prohibited from making overland flights.

It is conceivable that the SST could be prohibited from making any flights, should Congress not approve the money. Sen. Henry M. Jackson (D-Wash.), in whose state the plane will be built, expects a fight over the funds similar to the recent battle over the Sentinel ABM system (SN: 8/16, p. 127).

## NORTHWEST PASSAGE

### Oil, ice and ecology

The Northwest Passage was first crossed 116 years ago by Robert McClure, who had to leave his ship trapped in the ice and cross 200 miles by sled to meet a rescue party coming from the other direction. Roald Amundsen made the first passage entirely by ship, but it also took three seasons, beginning in 1903. Not until 1954 was the first single-season transit accomplished, by the Canadian ship *Labrador*.

Now a commercial vessel, the specially modified Humble Oil Co. icebreaker-tanker *Manhattan*, has cracked her way westward across the Arctic to the northern coast of Alaska. The state, for better or for worse, is clearly on the verge of a new era: an age of resource exploitation.

The death knell for a quieter, simpler Alaska was sounded in early 1968 when Atlantic Richfield, in partnership with Humble, announced the biggest oil strike in North American history. Conservative estimates of the bounty beneath Prudhoe Bay on Alaska's North Slope range between 5 billion to 10 billion barrels of oil. Others go much higher.

It was to test the possibility of ship transport for the oil that the S.S. *Manhattan*, already the largest ship in the U.S. commercial fleet, was quickly converted into an icebreaker and directed westward into the passage north of Canada's Baffin Island (SN: 8/23, p. 153).

She emerged in triumph from the mouth of Prince of Wales Strait last week, and by week's end was the guest of honor at a round of ceremonies at Prudhoe Bay and at Point Barrow, 150 miles to the northwest. The *Manhattan* headed back through the strait this week and will spend the next 30 days running tests in Melville Sound in the middle of

the Northwest Passage before continuing home to Philadelphia.

The ship has shown that a commercial vessel could make her way through the passage, but it is too early to claim that transit through the route by giant tankers has been proved an economic feasibility.

"They spent so much time learning to navigate the ship and getting out of the difficulties they got into a few times that they really were able to run very few tests of any length," says a Humble spokesman.

The scientists on board were disappointed, says Walter I. Wittman, an Arctic ice forecaster for the U.S. Naval Oceanographic Office. But he says they understood that the goal of the westward half of the voyage was primarily to get through the passage, not to conduct studies.

The 30-day period in Melville Sound is to be the real data-gathering stage of the mission. Scientists interested in such things as sea-ice physics will have more time for their investigations. And the engineers and technicians on board will be able to evaluate the ship's performance.

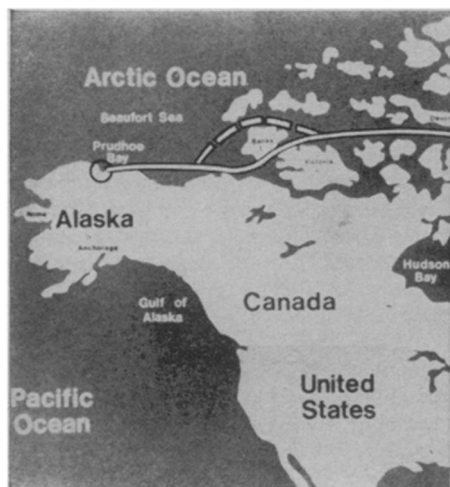
Basically the tests will consist of running the ship through uniform ice thicknesses at various speeds, while gathering data on variables such as the pressures exerted on the ship. The goal here will be to measure the ship's operating efficiency, to determine the most economical speeds for breaking through particular thicknesses of ice. This kind of information is needed to evaluate the long-term outlook for the tanker traffic across the Canadian Arctic to Alaska.

One thing already shown by the voyage is that "the *Manhattan* is the best icebreaker that has ever been built,"



Photos: Humble Oil Co.

*Triumphant Manhattan: Now for 30 days of performance tests and ice studies.*



*Solid line marks the epic journey.*

according to Wittman. He says this with a mixture of pride and envy because at the present level of funds available within the Navy for research and development on icebreakers, it would take about 18 years to develop a ship similar to the Manhattan.

The mission apparently has shown that the very old and weathered pressure ridges of ice are more troublesome than the younger, more jagged ones. Pressure ridges are deformations in the ice caused by a combination of wind, water and internal ice stresses that result in hummocks of ice sometimes five and six times its normal thickness.

**The potential** implications of the opening up of Alaska's North Slope could keep teams of ecologists busy for years. Whether some logical order can be imposed on the development remains to be seen. What for instance would happen if a future giant oil tanker split up on the ice? "We are concerned," says Dr. Lamont Cole of Cornell University, "because these Arctic ecosystems are very fragile and can take decades or even centuries to recover from some man-imposed disaster. For instance, in warm climates an oil spill might degrade quickly, but oil up there could last a good many years."

Of even more immediate concern is the Trans-Alaska Pipeline System, a 48-inch pipeline that would carry oil 800 miles south across Alaska to the warm-water port of Valdez.

The Department of Interior held hearings in Fairbanks last month on the application for a construction permit, but a decision is not expected for several months. The draft agreement is filled with stipulations for safeguarding the environment: Timber along the route would have to be cut away in an irregular fashion; large containment dikes would be required around storage tanks and pumping stations, and detailed contingency plans in event of leaks would have to be submitted. ◇

## A challenge to selectivity

A California dentist's legal battle to gain entrance into a professional society reaches the State Supreme Court in October. The outcome could severely limit the admission powers of professional societies across the country, and the case is being followed closely by private practitioners—and their professional associations—in fields from dentistry to psychoanalysis.

The case began more than three years ago when Dr. Leon Pinsker, a Long Beach orthodontist, sued the Pacific Coast Society of Orthodontists after it refused him membership.

Dr. Pinsker claimed that since membership in the society gave a practicing orthodontist numerous economic and professional advantages, it had no right to refuse admittance to someone who was qualified.

The society argued it was a private organization and therefore reserved the right to exclude whomever it desired without explanation.

**While the society** won in the lower courts, an appeals court reversed the decision early this year and ordered the society to admit Dr. Pinsker immediately without a retrial. In a precedent-setting opinion, the court ruled that professional societies have "reached the point where they are almost a necessity" and therefore they can no longer reject someone without legitimate reason.

The case has moved to the State Supreme Court on a procedural issue: The society claims the appellate decision ordering Dr. Pinsker's immediate admittance is a violation of due process, and so is not valid.

"This case has raised the question of what a professional organization can do to limit membership when an applicant satisfies all entrance requirements," explains Adrian Stein, one of Dr. Pinsker's attorneys. "We are trying to expand the present legal standard that says a society is only legally bound to admit someone who is qualified if membership is an economic necessity. We hope to define the word 'necessity' on a broader basis so that economic advantage constitutes reason enough to force a society to admit a qualified member of the profession."

**The doctrine** of economic necessity was set in 1961 (*Falcone vs. Middlesex County Medical Society*) when a New Jersey Court ruled a local medical society could not refuse a practicing obstetrician membership when it was required in order to use the local hospital.

Dr. Pinsker claims that he was placed at a disadvantage because he was not listed by the society as a qualified

orthodontist and so could not get referrals from other orthodontists.

He also says he was deprived of the opportunity to take advanced courses in orthodontal techniques given at a local university because they were offered only to members of the society.

**Although the case** will be argued in the State Supreme Court a decision is not expected for sometime. There appear to be three alternatives open to the court:

- It can approve the broader interpretation of economic necessity, but uphold the procedural question and send the case back to a lower court for a new trial based on the new guidelines. If this happens, the burden of proof will shift to the society, which will have to prove Dr. Pinsker is not qualified or otherwise defend his exclusion publicly.

- It can reverse the appellate court decision and go back to the prior, strict interpretation of economic necessity.

- It can affirm the appellate court opinion and order the society to admit Dr. Pinsker immediately.

Dr. Pinsker's lawyers say there has been a keen interest in the case by professionals across the country. "We have received a lot of telephone calls from doctors and others in the medical profession voicing concern over the problem, and wishing us the best," reports Mrs. Stein.

## FUSION

### Asking the engineers

"We are very pleased with the outcome. Most of us are physicists and we've a lot to learn from nuclear engineers. They can study our problems much quicker than we can." Thus, Dr. Sebastian Pease, director of Great Britain's Culham Laboratory, summed up the world's first conference, held in Britain last week, to discuss the shape of a nuclear fusion reactor.

The object of the meeting was the assessment of papers given last year by Dr. Robert Carruthers of Culham and in 1967 by Dr. David Rose of Massachusetts Institute of Technology on the prospective shape and cost of a thermonuclear reactor, assuming that the fusion of light nuclei (the reaction that goes on in a hydrogen bomb) can be controlled.

A Russian paper on a device called Tokamak, as a prospective fusion reactor, generated a lot of interest. Tokamak is the generic name for a series of toroidal devices designed by Soviet Academician Lev A. Artsimovich. Re-