

A challenge to selectivity



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 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-

sults reported by Dr. Artsimovich at a meeting in Novosibirsk last year and reiterated at MIR this spring (SN: 4/26, p. 397) indicate that Tokamak-Three, two meters across, has more closely approached the basic criteria for what Dr. Amasa S. Bishop of the Atomic Energy Commission calls fusion feasibility than any other.

Getting useful power from fusion of nuclei in a plasma of deuterium and tritium appears to demand certain values of plasma temperature, density and confinement time. Tokamak's plasma, confined by two interacting magnetic fields, one toroidal and the other longitudinal, is believed to have reached 3 million degrees for one-fiftieth of a second for a plasma density of 3×10^{13} (30,000 billion) particles per cubic centimeter.

Dr. Artsimovich's past reports, in which temperatures of 5 million degrees and densities of 70,000 billion particles per cubic centimeter have been claimed, aroused some skepticism in his Western colleagues. A British team is in Moscow to verify the figures with different and, they believe, more sensitive diagnostic instruments. "If our experiment works—and I think it will—we'll have much more information," says Dr. Pease.

But American fusion physicists are already impressed enough to be reproducing a Tokamak machine as the Ormak, at Oak Ridge National Laboratory in Tennessee.

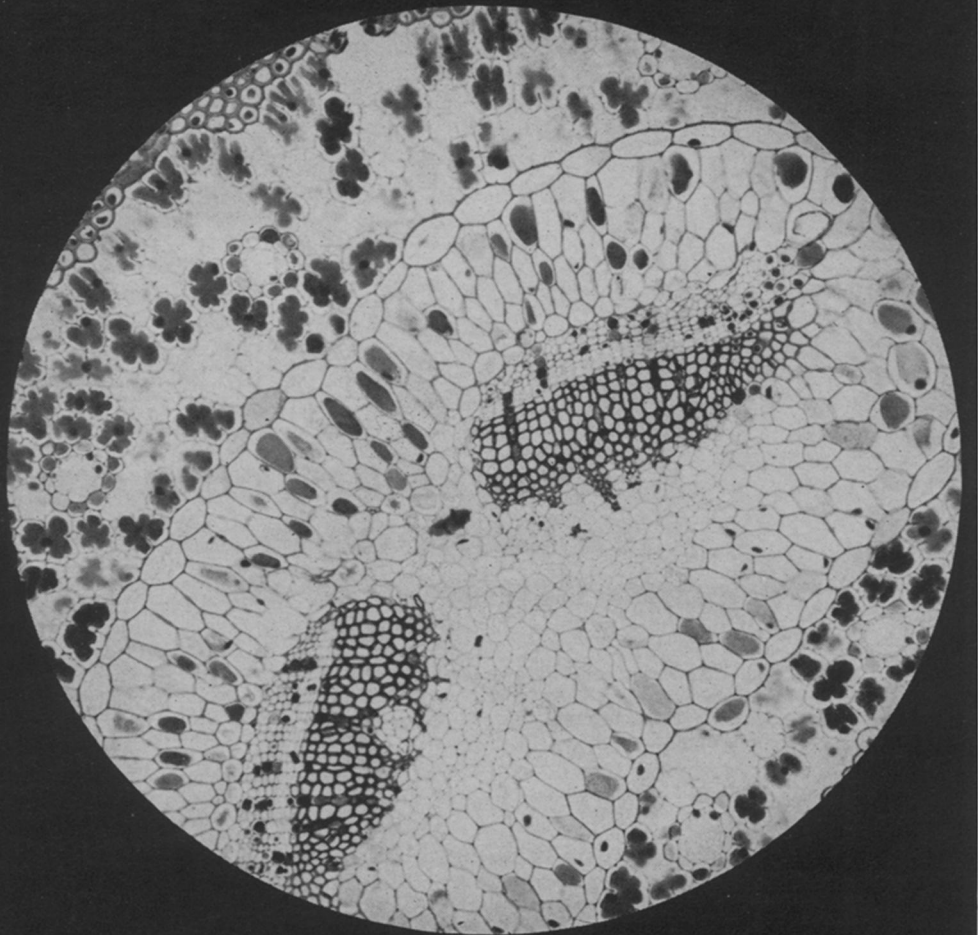
Russian confidence is summed up by Dr. I. N. Golovin of the Kurchatov Atomic Institute, who says: "What must be done is a construction of a series of developing units whose parameters reach gradually those of a reactor." He projects a three-step series toward a Tokamak reactor with a torus over 10 meters across that would develop 5,000 megawatts of heat.

The Russians hope that the first step, Tokamak-Ten, which the laboratory hopes to start next year, will take them to the stage called ignition, the ability to get more power out of a plasma than has to be put in to get fusion going. They will try for this with a quite small machine, one only one-and-a-half times as large as Tokamak-Three. Then would come what Dr. Golovin called the final laboratory unit with 1,500 megawatts heat output, using a torus 6.4 meters across and fields of the same order as a full-scale reactor.

Dr. Bishop, summarizing what he called Dr. Golovin's "excellent paper," pointed out some of the difficulties of scaling up the Tokamak scheme, not least of which is fitting two powerful magnetic circuits into a torus of modest dimensions. But "the simplicity of the system and the success achieved to date," he concluded, gave "real encouragement for the future." ◇

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