It is not clear how much technical skill is needed to employ the electric shock apparatus used in basement cells. And one cannot imagine the professional standards of the doctors who patch up the victims in silence or of the psychiatrists who prescribe "treatment" for the dissidents they label insane. But surely they demonstrate that our scientific ethic is not universal and that it fails us now, as it did when horrors were perpetrated in scientifically run concentration camps.

For scientists to be active in defense of human rights is to learn and relearn what Rabelais knew in 1532: "Science without conscience spells but destruction of the spirit" (*12*).

References and Notes

1. Christian Anfinsen, Lipman Bers, Clifford Geertz, Franklin Long, John Ross, and Berta V. Scharrer serve with me from the academy. Daniel Drucker and William Slichter are the liaison members of the National Academy of Engineering, and Adam Yarmolinsky is the liaison member for the Institute of Medicine.
2. Murray Todd serves as Executive Secretary, assisted by Jay Davenport, Sandra Erb, and Gerson Sher.
3. Estimated by the Indonesian government to number 29,000, of whom 10,000 were to be released in December 1977 and the remainder by the end of 1978. These estimates are contested by Amnesty International and some Indonesian human rights releases and purported leaders who place the number in excess of 50,000.
4. Our most valuable reading was the report of a committee chaired by J. Ziman: The Council for Science and Society in collaboration with the British Institute of Human Rights, *Scholarly Freedom and Human Rights* (Rose, London, 1977).
5. E. M. Leeper, interview with Philip Handler, "Academy shifts emphases to keep up with the times," *BioScience* **27**, 244 (April 1977).
6. For a less optimistic view and excellent review of the status of implementing these rights, see William Korey, "U.N. human rights: Illusion and reality," *Freedom at Issue* **42**, 27 (September–October 1977).
7. Communications to the Committee on Human Rights (1977).
8. Communication to the Committee on Human Rights, paraphrased slightly to preserve anonymity (1977).
9. Jahangir Amuzegar, "Rights and wrongs," *New York Times* (29 January 1978), section IV, p. 17.
10. Interview with Vladimir Kudryavtsev, "Human rights: How they are understood in the U.S.S.R.," *Soviet Life* (July 1977).
11. Excerpt from an address by Andrew Huxley to the British Association for the Advancement of Science, August 1977. Reprinted in *Chemical and Engineering News* (26 September 1977), p. 5.
12. François Rabelais, *Gargantua and Pantagruel*, book II, chapter 8 (1532) (Heritage Press, New York, 1942).

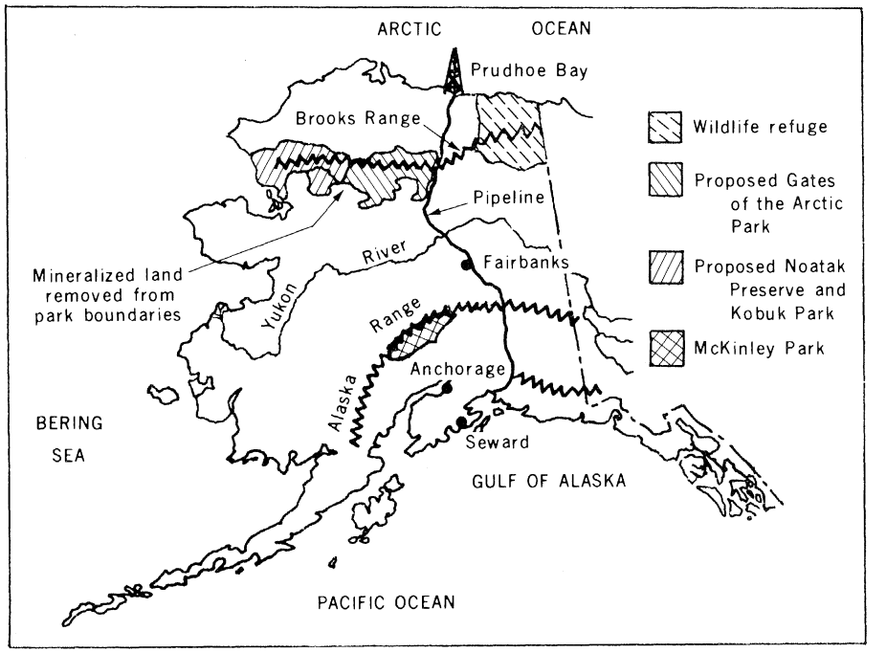
13. I gratefully acknowledge the assistance of M. Berberian, C. Gediman, E. Grohman, and the staff and members of the Committee on Human Rights in the preparation of this article.

NEWS AND COMMENT

Andrus in Alaska: A Tour of the Wild Estate

Anchorage, Alaska. The scenery and wildlife spectacles afforded by Alaska, the "Great Land," are impressive and varied enough to evoke a strong response from many who come here. Indeed, Representative John Seiberling of Ohio, a key supporter of the Alaska lands legislation now pending in Congress, has returned from each of his several trips to Alaska enthralled. "Alaska," Seiberling has said, "is Yosemite, the Grand Tetons, Yellowstone, the Grand Canyon, Glacier National Park, and the Serengeti Plains all rolled into one."

This state recently received another important Washington visitor who is also enormously impressed by Alaska. It was Secretary of the Interior Cecil D. Andrus, who is leading the Carter Administration's efforts to have Congress complete action this year on the Alaska lands bill and thereby have nearly 40 percent of Alaska's vast land area of 375 million acres assured special protected status as part of the "four systems"—that is, the four national systems of parks, wildlife refuges, forests, and wild and scenic rivers.



The bill was approved by the House of Representatives in May by the overwhelming margin of 277 to 31. Now, however, the measure faces substantial opposition in the Senate. The hard-rock mining and oil and gas industries object to the fact that substantial resources would indisputably be put off limits to exploration and development (*Science*, 4 November 1977). In the industry view, the nation can ill afford to "lock up" resources which, it is argued, will surely be needed in the future to stave off critical shortages.

Moreover, most nonnative Alaskans and their elected officials are opposing the bill as it is now written. Alaskans typically are holding the flag of state's rights high and demanding that much the greater part of the public lands be open to a variety of uses and largely unrestricted access. More specifically, the two Alaska senators, Mike Gravel and Ted Stevens, Democrat and Republican, respectively, want the acreages that would go into the conservation systems to be much smaller than what the Administration has proposed; they also want provision to be liberally made for well-defined transportation and utility corridors. In addition, the senators hope to see a program of joint federal-state land management established for regions

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where there is a mix of federal and state land, and, in many instances, native and other private land, too.

In early July, Andrus was in Alaska leading a dozen news reporters on a week-long tour of the state. His party crisscrossed the state in a fleet of four airplanes, visiting places such as Mount McKinley National Park, the Kobuk River Valley and the Brooks Range (where major new refuges and parks are proposed), and the National Arctic Wildlife Refuge. The secretary's obvious aim was to drum up maximum public support for the Alaska lands bill which may now be nearing a critical test in the Senate, where Gravel has promised to filibuster.

Andrus is an outdoorsman from the Northwest who grew up hunting and fishing. He was in his element as the fat-bellied Gruman Goose amphibian ferried him and his party into Selby Lake, a pristine glacial lake nestled in a spectacular mountain setting on the south side of the Brooks Range. It was the weekend, and Andrus, a lanky 6-foot-2, had his mind set on fishing. Dressed in a blue cotton plaid shirt, dungarees, and a duck hunter's cap, he looked as much like one of Alaska's professional bush pilots or guides as he did a Secretary of the Interior and former governor of Idaho. Accompanied by a fishing enthusiast from his official entourage, Andrus, fly rod at ready, promptly took off down the lake in an outboard-powered rubber boat in quest of Arctic grayling and lake trout.

From this and other experiences during the trip, Andrus was to say, and say repeatedly and ardently, "I'm more convinced than ever that these places must be protected." In what has come to be a favorite catch-phrase, he says the Alaska lands bill represents "the last chance for us to do it right the first time."

As passed by the House, the bill—known as H.R. 39—would add some 101 million acres to the four national conservation systems, with much the greater part of the acreage going into parks and wildlife refuges.

Some of these units would be large enough to embrace entire river drainages and regional ecosystems, and this is what Andrus means by "doing it right the first time." Experience in the lower 48 states has shown that refuges and parks can eventually fall into jeopardy unless made large enough to include essential watersheds, habitats, or buffer zones. The secretary cites the troubles that have befallen the Everglades, Indiana Dunes, and Redwoods parks as cases in point.

Enactment of the pending legislation would complete the process of land allocation that began with the Alaska Statehood Act of 1958. That act gave the new state the right to select and take ownership of 104 million acres from the public domain lands, an entitlement which in toto will represent an area a bit larger than California.

The central Brooks Range. [Photo by M. W. Williams, National Park Service]

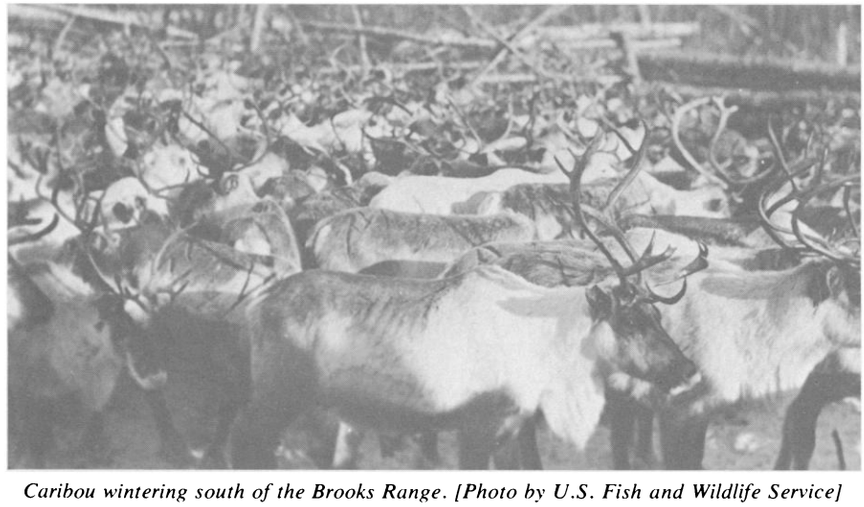
The process was carried further with the Alaska Native Claims Settlement Act of 1971. It provided for the establishment of Eskimo, Indian, and Aleut native regional and village corporations and gave them a total land entitlement of 44 million acres.

The state and native land selections have not been completed and cannot be until Congress decides what land is to go into the four systems. The pending measure would in fact provide for expeditious conveyance of land to the state and natives. Accordingly, all Alaskans have a stake in seeing the Alaska lands controversy settled; nonetheless, many would prefer to have the matter carried over to the next Congress, which they hope will be less in sympathy than the present one with preserving huge areas of wilderness.

As it happens, the part of the Brooks Range which Secretary Andrus and his party visited is the subject of what has the look of a classic conflict between wilderness preservation and mineral resource development.

Selby Lake, where the Andrus party made camp for 2 days, is part of what would become, under H.R. 39, the Gates of the Arctic Wilderness National Park. This park, covering an area half again the size of Massachusetts, would have within it some of the most arresting features of the central Brooks Range, including its remarkable combination of gentle valleys and sharp granite spires.

But the geologic treasures to be found in and around the proposed park are not confined to the scenic. For cutting across the lower part of this park and areas con-



Caribou wintering south of the Brooks Range. [Photo by U.S. Fish and Wildlife Service]

Secretary Andrus fishing from excursion boat near the proposed Kenai Fjord National Park. [Photo by Edward Flattau]

tiguous to it is one of Alaska's most highly mineralized zones. Several rich deposits of copper, lead, zinc, and silver already have been found, and other valuable deposits are suspected to be present.

The Gates of the Arctic Park would be managed strictly as wilderness, with no mining allowed and with even recreational use deliberately kept low through a reservation and permit system. There would be no roads into the park and no established campgrounds; access would be by aircraft flying in to designated water or gravel bar landing sites. And, although the Brooks Range is noted as prime habitat for such game species as Dall sheep, barren ground grizzly bear, caribou, and wolves, sports hunting would be prohibited, just as it is in parks in the lower 48 states. Only such hunting as has been traditionally carried on in the region by Eskimos or others to meet subsistence needs would be allowed.

For all his concern to see much of the Alaskan wilderness preserved, Secretary Andrus insists that the boundaries set forth in the Administration's proposal for the Gates of the Arctic park and other proposed park and refuge units reflect a conscientious effort at striking a reasonable balance between preservation and development. It turned out that, at Selby Lake, Andrus was to have encounters with two men who neatly epitomized the conflicting pressures and points of view with which he has had to cope.

One of them was Ray Bane, a National Park Service anthropologist with a deep commitment to keeping the best of the Brooks Range and arctic Alaska pristine and undefiled. The other was Dave Heatwole, regional senior geologist in Alaska for the Anaconda Company.

The encounter between Andrus and Bane came during a helicopter excursion into the Brooks Range. Bane is an intense, wry little man who has lived, fished, and hunted with the Eskimos of the villages along the Kobuk River, which rises in the Brooks Range to the east of Selby Lake. On this occasion, he had about him an air of excitement that befitted an interpreter of a region that such noted explorers of Alaska as the late Robert Marshall and Olaus Murie have extolled for its wildness and beauty.

At Bane's direction, the helicopter made a low pass through part of the valley of the Alatna River, a gentle, meandering stream flanked by some of the most rugged country in the Brooks Range. Then, taking a sharp turn to the southeast, the copter followed Arrigetch Creek, a tributary of the Alatna, up to its source near the foot of the jagged, cold-gray granite monolith that forms the Arrigetch Peaks.

The helicopter alighted in a spongy meadow beneath the peaks, and Andrus, Bane, and a few reporters accompanying them got out. "This country is fantastic," said Bane. "In some places, no human—not even the Eskimo—has ever set foot. We're not in the business of just saving some scenery. We're trying to save a wilderness. Bob Marshall wanted to save everything north of the Yukon."

Late-Night Sessions

Andrus, who was listening sympathetically, then observed with a touch of hyperbole: "The original Park Service proposal [for the Gates of the Arctic] would have come close to doing just that. We stayed late at night in my office deciding what to keep in, what to take out. Some of the Park Service people finally went home early, before the rest of us, saying they didn't want to be witness to what was being done."

Bane smiled. "It's like asking, 'Do you want to lose your big toe, or your little finger?' " he said.

One area painfully cut from the Gates of the Arctic boundaries was a pocket in the mineralized zone which is dotted with valid mining claims and several known deposits containing exceptionally rich ores estimated to be worth upwards of $6 billion. Potential mining activity in this pocket was the subject of the encounter between Andrus and Dave Heatwole, the geologist for Anaconda.

It came the morning after Andrus' flight with Bane up to the Arrigetch Peaks. Andrus and Heatwole stood on a high knoll looking across a ravine to the down slope of the next mountain. "This is the Sun Deposit," Heatwole said. "There is more than a billion dollars worth of minerals in place in that mountain. The ore is ten times richer than what we are mining in Arizona."

Heatwole said that the Sun Deposit represented only one of about 200 mining claims scattered across the 80-mile-wide pocket or "niche" which is bordered by the proposed Gates of the Arctic Park to the east and north, and by the proposed Kobuk Valley National Park to the west. One of the claims is at the Kennecott Company's fabulous Arctic Deposit, where $4 billion worth of minerals is estimated to lie beneath less than a quarter square mile of land. Moreover, according to Heatwole, the mineralized zone, with rocks of high potential, is not confined to the pocket but extends beyond it into the proposed parklands to the east and west.

Implicit in what Heatwole was saying was that, from the point of view of Anaconda and the other companies that have been carrying on mineral exploration in the Brooks Range, the park proposals posed serious conflicts. For one thing, the companies would like to be free to explore for additional deposits throughout the mineralized zone. For another, the mining companies do not want the routing of the haul roads serving their operations to be severely constrained by park boundaries. Anaconda, in particular, wants to be able to build (or have the state build) a haul road that would proceed eastward from its Sun Deposit across what is coming to be known as the "boot" of the Gates of the Arctic Park.

According to Heatwole, this routing would take advantage of a "natural corridor" through the Brooks Range foothills and allow the road—to cost about $1 million a mile—to tie in with the Trans-Alaska Pipeline haul road, some 125 miles (as the crow flies) to the east of the Sun Deposit. If, instead, the road must go around the boot of the park, the routing will not only be longer but more difficult, as it would cross the marshy and extensive Pah River flats.

Secretary Andrus was visiting the Anaconda mining claims and exploratory core drilling operations at the company's suggestion. What he found was that,

through the use of helicopters instead of ground vehicles to move the drilling rigs from place to place, scarcely any scars were left on the landscape, unlike what Kennecott had done about a decade earlier in carrying on core drilling at the Arctic Deposit. But, once the construction of haul roads and actual mining operations began, scarring would of course be inevitable (although the Sun Deposit would be deep-mined, the Arctic Deposit lies at the surface and would have to be exploited by open pit mining).

The secretary made it clear that he could not go along with what Anaconda wanted. No question about it, mining and haul roads should be kept out of the park, for otherwise the park's wilderness character could not, in his view, be preserved. But, as Andrus knew, the question as to how liberally or conservatively park and refuge boundaries would be drawn, and whether transportation corridors through them would be allowed,

Managing a Park for People and Bears, Not Automobiles

McKinley Park Station, Alaska. Alaska offers two very different kinds of outdoor experiences for visitors from the "lower 48." One is the kind afforded by remote, roadless wilderness, often accessible only by bush planes capable of landing on lakes or river gravel bars. The other is available to all, even the very young or old and infirm. Mount McKinley National Park, situated about 200 miles north of Anchorage in the Alaska Range, offers an experience of this latter kind, although its backcountry is big, rugged, and wild enough to contain the ambitions of wilderness enthusiasts too. Often the experience includes an interesting, and safe, encounter with a grizzly bear.

McKinley Park, which under the Alaska lands legislation now pending in Congress would be enlarged and renamed Denali ("the Great One" after the ancient Indian name for Mount McKinley), is a major attraction because of its scenic splendor, abundant wildlife, and in particular, its unusual accessibility.

Good highways, and roads of any kind, are few in Alaska, but the relatively new Anchorage-Fairbanks highway runs right by McKinley's eastern boundary. Moreover, a gravel road runs for some 90 miles through the center of the park. But easy accessibility and heavy visitation are a mixed blessing.

Adopting the right management philosophy and practices is essential if a park is to serve its purpose of allowing visitors to enjoy it, if not in an absolutely unaltered and pristine state, at least in one in which the ecology has not been disrupted by needless intrusions. The key to the plan here at McKinley is the system of free park shuttle buses that has been in service since 1972, the year the Anchorage-Fairbanks highway opened and greatly increased the number of visitors (now at about 150,000 a year, or nearly triple what it was in 1971). Visitors can either remain on the buses for a motor trip through the park or get off at almost any point for short hikes or long backpack trips. Visitors who arrive in private cars are allowed to drive about 10 miles into the park, but no farther unless one of the relatively few sites available at campgrounds in the inner park has been reserved.

Park Service officials know that, without severe restrictions on automobile traffic, the park's gravel road would become inadequate and dangerous unless rebuilt and paved at a cost of about $1 million a mile. Even more important, the wildlife spectacle for which the park is famous would be sadly diminished.

As it is, visitors have excellent opportunities to see moose, ptarmigan, caribou, Dall sheep, and, yes, even grizzly bear. In fact, the day in early July when Secretary of the Interior Cecil Andrus and a group of reporters took a bus tour of the park, a sow grizzly and her three nearly grown cubs were observed in an alpine meadow maybe a half mile from the park road.

No grizzly is to be trifled with, and least of all a sow with cubs. The secretary and the reporters listened respectfully as Bill Truesdell, the park naturalist, told about a visitor who disregarded warnings not to approach grizzlies too closely and tried for a close-up photograph. "The bear charged, and, finding that he could not outrun the bear, the man fell into a fetal position, with a hand over the back of

his neck. The grizzly broke an arm with one snap of her jaws, then turned away, as though to say, 'You came too near, and this is your punishment.' "

Truesdell told also of how, only 2 weeks earlier, a bus load of visitors had witnessed a bloody drama that involved the same four grizzlies that the secretary's party had observed. The bears had finally succeeded in separating a cow moose from her two calves, then killed both of the calves. According to Truesdell, one past season another group of visitors saw a similar nature-in-the-raw drama involving a cow moose, two calves, and a pack of five wolves.

That visitors witness such episodes even rarely is a measure of the management plan's success in maintaining some semblance of wilderness conditions even near the park road. Buses have been substituted for cars at a few other parks, too. But the shuttle bus system here at McKinley represents an unusually ambitious and appropriate application of the idea that there are some places where automobiles simply do not belong.—L.J.C.

was going to depend on how much political muscle the Alaska senators and lobbyists for the mining and the oil and gas industries exert in Congress.

After the stop at Selby Lake, the Andrus party's tour moved on to the existing National Arctic Wildlife Refuge, an area where the conflict is between wilderness and potential oil and gas development. If H.R. 39 should become law as now written, the refuge would be enlarged to take in an area in northeast Alaska substantially larger than the entire state of West Virginia, and most of it would be classified as wilderness, with no oil and gas development permitted. Yet nearly everyone agrees that there is a significant potential for discoveries of oil and gas in that part of the existing refuge which is in the Arctic coastal plain.

Last year, when the Administration was putting together its Alaska lands proposal, Secretary Andrus bested the Department of Energy in an interagency battle by persuading President Carter that oil and gas development should be kept out of the refuge. The refuge is unique, partly because it serves as the calving grounds for the Porcupine caribou herd, which, with its some 120,000 animals, is now the largest herd in North America.

Andrus has been well aware that the question of whether the nation should place wilderness and caribou ahead of oil and gas could, in the final analysis, depend on the estimates as to how much oil and gas the refuge contains. Accordingly, last May he eagerly seized upon a new U.S. Geological Survey report which speculates that, while the refuge offers good potential for discovery of oil and gas deposits of medium to large size, discovery of another "supergiant" field comparable to the one at Prudhoe Bay is unlikely.

The secretary has taken the attitude that the value of the refuge and its caribou far outweigh the value of speculative and possibly unexceptional oil and gas resources which, even when developed, would be "finite and rapidly expended."

Enroute to the refuge, Andrus and members of his party stopped briefly at Prudhoe Bay where Angus Gavin, the Atlantic Richfield Company's ecologist in residence, told them, in effect, that oil fields and caribou are quite compatible. The study, conducted by Gavin in the Prudhoe Bay field and in a larger undisturbed area adjacent to it, had shown, he said, that the presence of the big pipeline, the gathering lines, and other facilities had not bothered the caribou.

"Actually, we have the only stable herd in the Brooks Range," said Gavin, referring to the small central arctic herd variously estimated to have from 5000 to 7000 animals. Gavin observed that the caribou even seemed to prefer to crawl under the elevated pipeline rather than use the grade level crossings provided for them.

But Andrus and the U.S. Fish and Wildlife staff people with him took Gavin's assertions with a grain of salt. A study of the behavior of the central arctic herd sponsored by the Department of the Interior, the state of Alaska, and the Alyeska Pipeline Company had indicated that caribou, and especially cows and calves, were tending to avoid the pipeline and its associated haul road. According to the study, the herd seemed to be separating "into eastern and western components, each with largely independent north-south movements."

Briefing

The Canceled Computer: Were Carter's Facts Right?

A curious difference on facts has emerged between the White House and Sperry-Rand Corporation, makers of the computer that was to be sold to the Soviet news agency Tass until the proposed sale was vetoed by President Carter on 16 July.

At a news conference held 5 days later, Carter said that the computer was "very advanced" and "would have provided a quantum jump in computer capability, multiplying the speed of the computer, I think, 20-fold." The machine was also "far in excess" of Tass's requirements, the President stated.

Sperry-Rand officials do not dispute the President's right to block the sale but do disagree with the statements he made at the 20 July news conference. The computer, a Sperry-Univac 1100/10, is at the lower end of the 1100 series. Its speed of operation, far from being 20 times greater than any other machine the Russians have access to, is comparable to that of the 1106/2 model already installed in the offices of Aeroflot, the Soviet airline.

Sperry-Rand officials say that the parameters of the machine proposed for Tass fell within the guidelines set by the interagency committee which monitors strategically sensitive trade with the Soviet Union. They also deny that that machine was more capable than necessary. "We had studied Tass's requirements for 2 years before proposing this system," a spokesman says.

The Export Control Administration, whose officials chair the interagency committee, declines to comment on the differences between the White House's facts and Sperry-Rand's, saying it cannot discuss the details of any export application. One official says that decisions are made on a case-by-case basis, and that "we would certainly try to see if the computer proposed was reasonable for the end use."

The interagency committee is supposed to review applications within 90 days. The Sperry-Rand proposal has been with the committee since last fall, suggesting that there may have been problems of some kind. Asked if he knew the reason for the delay, a Sperry-Rand official said that "We had no negative vibes whatsoever from the interagency committee. The first indication we had of a problem was at the President's announcement."

In vitro Infant Raises Tempest in Test Tube

The birth in Oldham, England, on 25 July of the first child to be conceived in vitro marks the development of an obstetric technique which may well prove useful for some infertile couples until it is superseded by methods for unblocking the Fallopian tubes.

The ethical problems raised by the technique do not differ from those of artificial insemination except in that the fertilized eggs not selected for implantation are destroyed, and the selected embryo could in theory be implanted in another woman's womb, making possible the reliance on "surrogate mothers" for those unable or unwilling to carry a child to term.

For longer renditions of these facts, see any newspaper or magazine.

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As luck would have it, the Andrus party found and flew over a sizable part of the Porcupine herd, which was assembling prior to making its annual trek from its summer habitat on the North Slope across the Brooks Range and into Canada, where it winters in the boreal forests of the upper basin of the Porcupine River. It was early afternoon, the sun high in a cloudless sky, and the caribou, some 20,000 to 30,000 of them, were moving slowly through the foothills above the arctic plain. The tundra, a subtle beige and light green, offered not the slightest sign of ever having been visited by humans—there was not a road, not a seismic line, not a mark or blemish of any kind as far as one could see, from the Arctic Ocean to the Brooks Range.

"The Eskimos say, 'No one knows the way of the wind and the caribou,' " Andrus has said. "[But] we do know that if the herd is dispersed or broken up by [oil and gas] exploration activity, it may never regroup again. This is a chance we decided not to take."

Throughout his Alaska tour, the secretary found the friendliest political terrain in the native villages, such as Kaktovik, a village of 132 people on Barter Island, on the edge of the Arctic Wildlife Refuge and the Beaufort Sea. At Kaktovik, the villagers depend on caribou meat to help carry them through the winter, and last year they took about 100 of these animals.

Their mayor, Marx Sims, the postmaster (and a white nonnative), told Andrus that the villagers were totally opposed to oil and gas development in the refuge. Such development, they believed, would interfere with calving and bring about a disastrous decline in the herd. The Eskimos of villages to the south of the Brooks Range had adopted resolutions expressing the same apprehensions.

On this as on previous trips to Alaska, Secretary Andrus heard many nonnatives voice the protest, implicitly or explicitly, that H.R. 39 represents a callous attempt to put many of Alaska's most choice areas off limits, not just to development, but also to sports hunting and even to convenient access for fishing or other outdoor pursuits. Yet, as Andrus sees it, his philosophy of achieving "balance" in use of resources applies as much to the classification of land for various kinds of recreational activity as it does to classifying land for development or wilderness preservation.

For example, in the Andrus view, the Gates of the Arctic Park and the Arctic Wildlife Refuge are best regarded as special places which one perhaps will visit rarely, if at all, but which will always be there, pristine and inviolate. Yet, at the same time, a number of other parks and refuges will serve large numbers of visitors, as in the case of those along the coast of Alaska and in parts of the interior which are easily accessible by excursion boat, railroad, or highway.

The first and last days of the Andrus tour featured visits to such places. One was by excursion boat from the town of Seward to the sea lion rookery on Chiswell Island, near the proposed Kenai Fjord National Park on the south central coast of Alaska, about 100 air miles below Anchorage. The other was by tour bus through part of McKinley National Park (see box), now accessible by the main highway that connects Anchorage and Fairbanks as well as by the Alaskan Railroad.

Briefing

Tank Can Run, Shoot, and Vanish in a Puff of Smoke

Aberdeen Proving Ground, Maryland. The Army last month unveiled its new main battle tank, a weapon that it hopes will dominate the battlefields of the 1980's. In an impressive display of martial joie de vivre, the 59-ton behemoth cavorted across the Maryland countryside at speeds averaging 30 miles an hour, at times briefly airborne as it soared with elephantine grace over the hillocky terrain. Firing on the run, with the aid of a laser range finder and ballistic computer, the new tank shot at targets three-quarters of a mile distant, a bright flash of metal against metal signaling a hit every time.

For its final trick, the XM-1 launched a bevy of smoke grenades which, after a brief fireworks display high above the tank, swathed it within seconds in a swirling gray cloud. When the smoke dispersed, several minutes later, the tank had vanished behind cover.

With finely calculated showmanship, the Army put the XM-1 through its paces side by side with an M60, the present main battle tank. Either the M60 wasn't trying its hardest, or the XM-1 has considerably better acceleration and speed and shoots more accurately, even though both tanks use the same 105-mm cannon.

The chief new feature of the XM-1 is its method of protection, a material of classified composition known as Chobham armor after the location of the British research unit where it was invented (*Science*, 14 July 1978). The 105-mm cannon and the smoke grenades are also of British design.

An important feature of the tank is its 1500-horsepower turbine engine, which is nearly a ton lighter than the comparable diesel engine. Tank designers have been trying for years to build a good turbine engine but have generally found that the large size required more armor, thus negating the weight advantage. The engine, built by the Avco Lycoming Division of Stratford, Connecticut, can operate up to 12,000 miles between overhauls, some two and half times longer than other production tank engines. The entire power pack can be removed and reinstalled in less than an hour, compared with four hours for current tanks.

Ammunition fires are a common cause of destruction of battle tanks. Designers of the XM-1 have placed the crew and main ammunition in separate compartments with armor bulkheads and sliding armor doors in between. The tank has a fire extinguisher system designed to react to fires in 3 milliseconds and quench them in 200.

The XM-1 has a four-man crew of gunner, loader, driver, and commander. The main contractor, Chrysler Corporation, will start turning out production models in February 1980. Chrysler is to build 3,325 XM-1's under a $4.7 billion contract.

—Nicholas Wade

After seeing the McKinley Park Station Hotel thronged with tour groups of elderly visitors, including even a woman in a wheel chair, Andrus observed: "This is the rebuttal to those who say Alaska is only for the young and the rich."

Underlying all of the secretary's thinking about Alaska is a conviction that Alaska, given its enormous size and extraordinary resources, is an exceptional part of the American patrimony and should be treated as such. The 104-million-acre land grant made to the state of Alaska under the Statehood Act was, he says, vastly larger than any land grant ever made to any other state. Similarly, the settlement of native land claims was, he feels, not ungenerous. Now, Andrus says, it is time to set aside for the nation as a whole "the crown jewels of the Alaskan wilds."—LUTHER J. CARTER

China's "Four Modernizations" Lead to Closer Sino–U.S. Science Ties

The United States' already flourishing ties with China were further strengthened last month when presidential science adviser Frank Press journeyed to Peking with a delegation of the Administration's top-ranking scientists. It was the first such government-to-government exchange between this country and the People's Republic of China and marks what Press calls a major step toward "building a relationship with China similar to those we have with other countries."

Press and his party,* which he says "represented the whole of civilian science and technology in the U.S. government," held preliminary talks that are expected to lead to substantive scientific exchanges which previously have been impossible because of the Chinese position that full normalization of political ties must come first. However, within the past year or so China's policy has changed in a number of respects, and it is now hoped that scientific exchanges may, in fact, ease the path to normalization. The Press mission was initiated in the White House, though there was every indication from China that the moment was propitious.

Ever since the overthrow of the "Gang of Four" and the denunciation of the tenets of the "cultural revolution" which kept China in a scientific and technological backwater, the new government in Peking has been framing a policy that will enable the Chinese to catch up. Thus, China is committed to the "four modernizations": modern science and technology as the foundation for modern agriculture, industry, and national defense.

Frank Press is greeted by Vice Premier Teng Hsiao-ping at the Great Hall of the People in Peking.

Last March, the Chinese held a national science conference, unprecedented in recent times, at which "pragmatic" leaders spelled out what they envision. "The entire nation is embarking with tremendous enthusiasm on the march towards the modernization of science and technology. Splendid prospects lie before us," declared Vice-Premier Teng Hsiao-ping, who is actively engaged in expanding China's contacts with foreign nations. On the theory that "Backwardness must be perceived before it can be changed," Teng spoke bluntly about China's state of affairs and her new determination to catch up with and even surpass the rest of the world, adhering "to the policy of independence and self-reliance." Then Teng went on to say, "But independence does not mean shutting the door on the world, nor does self-reliance mean blind opposition to everything foreign."

Already China has established strong ties in science and technology with a number of foreign nations, notably France, Germany, and Japan—all countries with which it has diplomatic relations. According to Western observers, the Chinese have sensibly decided to buy the best in science and technology and are interested in acquiring from America certain items it cannot get from other nations—off-shore oil rigs and drilling equipment are often cited as an example.

Although Press was unwilling to speak in detail about specific areas for future exchanges with the Chinese—he said it would be "premature"—he talked in general terms about what is anticipated and emphasized among other things a "growing commercial exchange." It should be noted that at present it is precisely in the business arena that the most substantive activity is taking place. The Chinese have purchased chemical ferti-

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