

## Trail Log 1995-1997

### Holmes Rolston, III

#### Summary

1995 Military Veterinarians' Symposium, San Antonio, Texas, and Lost Maples State Natural Area. Local trails and trips, Rocky Mountain National Park.

Africa: East Africa

Kenya: United Nations Environment Program. Kikuyu Hospital. Aberdare National Park. Mt. Kenya Safari Club. Samburu Game Reserve. Sweetwaters Camp. Masa Mara.

Tanzania. Lake Manyara, Serengeti, Ngorongoro Crater

Africa: South Africa

Visiting Professor, University of Stellenbosch. Lectures. Bush Camp in Kruger National Park. Wilderness Trail, Metsimetsi, in Kruger. Wilderness Leadership School trek, Umfuluzi. St. Lucia. Addo Elephant Park. Cape of Good Hope. Fynbos flora.

Rocky Mountain National Park, backpacking.

Slovenia. Ljubljana, Conference on Conservation of Nature Outside of Protected Areas, and karst landscape in Slovenia. Helsinki, Finland. Cascade Head, Oregon.

1996 Arizona. Petrified Forest. Grand Canyon, hike to Phantom Ranch.

Yellowstone wolves. Minnesota wolves.

Sweden, Oxford, Denmark, Romania, Estonia

Australia. Australasian Philosophy Conference, Brisbane. Cairns and Great Barrier Reef. Tam O'Shanter State Forest and cassowaries. Noosa National Park. Braidwood and Val Plumwood. South Australia and fairy penguins. Tasmania. Adelaide and Lawrence Johnson. Perth and Western Australia. Ayer's Rock (Uluru).

Northern Colorado, backpacking. Loxahatchee National Wildlife Refuge, Florida, and Everglades.

1997 Eagles on Colorado plains.

Yellowstone wolves and wildlife.

Siberia and Lake Baikal.

Rocky Mountain National Park, backpacking. Yellowstone backpacking. Horsepacking,  
Scapegoat Wilderness, Montana

Alamosa National Wildlife Refuge, Colorado

1995

January 4, 1995. Wednesday. Adult bald eagle flying right over campus, over the Eddy building, in clear blue sky, the only bird in sight. Rather cold weather, snow covered ground.

January 6-9. Military Veterinarians' Symposium, San Antonio Texas. Talk on wildlife on military bases. Col. Paul Barrows, their commander. Saturday, after talk, walked through the Alamo. Sunday, rented car and drove through Texas hill country to Lost Maples State Natural Area. North on 281, then west on 473 to Kendalia, Sisterdale, Comfort.

Lunched in a nice picnic area at Camp Verde. Lots of game fences in here, trying to keep whitetail deer on their land for hunting leases, or, in other cases, fencing in exotic species to hunt. Reached Lost Maples. This is named for Bigtooth maple, Acer grandidentatum, found here (and all up and down the Sabinal River), somewhat as a disjunct. It is abundant in Utah, also in Arizona, Wyoming, reported in Montana. It is in Colorado rarely, at Mesa Verde. Hiked down the maple trail and on down the East Trail a ways. Ashe juniper, Juniperus ashei, is the common tree on hillsides. Also various oaks, Texas ash, Fraxinus texensis; Sugar hackberry, Celtis laevigata; and others. Lovely day. Shirtsleeve weather. Returned and spent night with Paul Barrows. Wife, Becky, daughter of Presbyterian minister in Pennsylvania. Monday early, flew home.

Most of the ticks that carry diseases go on and off warm-blooded animals three times, often the first two stages on very small mammals, like mice and voles, when the larvae are almost too small to see, like pinheads. Only the third stage do they climb higher shrubs and get onto larger mammals. The best way to pull them off is to pull gently for a minute or more; this tires their jaw muscles and they turn loose. But if you squeeze them, feces may contaminate your fingers and then you may rub it back onto your body, in eyes, etc. Use some waxed paper to pull them, if you can. (Veterinary talk)

Bald eagle. Seen at Fossil Creek Reservoir leaving for Louisiana, Chicago trip. Nice adult.

February 9, 1995. Thursday. Mother died. I flew to Richmond. Buried her Sunday afternoon, February 12, in bitter cold at Hebron. More in family history book.

March 25. Huntington, West Virginia, trail behind art gallery, with Mary Jack. In good bloom: Rue-Anemone (Anemonella thalictroides), Toothwort (Dentaria diphylla), Bloodroot (Sanguinaria

canadensis), Spring Beauty (Claytonia virginica), Spicebush, Heal-all (Prunella vulgaris), Chickweed (Stellaria media), periwinkle, redbud, red maple. Trilliums coming on, but not yet in bloom. The Claytonia display down at the bottom of the trail, near the Interstate, was the best I think I have ever seen.

March 26. Chambersburg, Pennsylvania. Hour's hike with Ray Anderson on the Appalachian Trail. Nice hemlock woods lower down, oaks higher up, but nothing out. Speaking at Wilson College.

Apr. 23. Sunday. Rocky Mtn National Park, with Jennings and Dale Bunch, and Jane. Drove up and went to church. Some blue skies at first but then snow showers most of the day. A few elk before church around town. Then into Moraine Park and ate overlooking the park with fifty elk out in the meadow. Coyote came close by car while we were eating. Drove up Bear Lake road, with increasing snow. Another coyote in the road, seen briefly. Jennings and I walked into the lake, in falling snow. Perhaps a dozen deer.

Returned, drove up Deer Ridge. Not far from the ridge top, half a dozen deer, and one coyote. Watched one deer, a doe, several times run after the coyote chasing it off. Three coyotes today. Over Deer Ridge and down into Horseshoe Park, nothing there. Back toward town, about a dozen bighorns, all ewes, and splendid scene with them on rocks hillside in falling snow. In Big Thompson Canyon, at the diversion a mile or so west of the siphon, three bighorns, two half curl rams. Nice in the scope.

May 5, Friday. Rocky Mtn National Park with Markku Okansen, Turku, Finland. The usual. Went to eat our lunch on rock at Many Parks Curve, only to discover that I had put in the wrong thermos case and we had none. Lunched at a pizza place in town. Snipe winnowing along creek in Moraine Park, quite noisy. It was hard to get out of earshot of the winnowing.

very rainy May. Rain and overcast virtually every day.

May 25, Thursday. Rocky Mountain National Park with Hui Yu, her mother, and Jane. Quite overcast. Elk all over the place, must have seen a thousand. It was hard to get out of sight of a couple elk, often of a couple dozen, and hundreds seen in Moraine Park and elsewhere, though few in Horseshoe Park. Briefly snowshoed with Hui at Bear Lake. A dozen nice bighorn rams back toward town, leaving Horseshoe Park. Snowpack is twice normal, in some places nearly three times normal.

May 26, Friday. Back to Estes Park for a CSU Extension Leadership Education conference at the Holiday Inn. Took Hui back and drove up into the park briefly before the conference and about an hour after it. Finally clear, in the morning, and, at midday the peaks were still clear, though skies overcast. Same elk.

May 27, Saturday. Owl seminar, with Kevin Cook. No owls. We tried the habitat on the other side of the road from the Cub Lake trailhead; this goes up to an area with lots of dead and dying aspen with cavities and holes, ponderosa pine nearby. Also tried the area right at lower end of Beaver Meadows, parking on the Bear Lake road. Kevin says this is a good area.

Snipe winnowing, very conspicuous sound: huhuhuhuhuhu. This is made by their outer tail feathers when they are in the air. Look for them in the air; they are hard to see. May be quite high. Tell by the long heavy, though narrow bill, long, dark, pointed wings, and the rapid wing beat. This winnowing is on the bird records, East and West, one winnow only on each set, but it is there.

"Winnow" - the root is wind, vent, to fan. Wheat is winnowed from chaff, fanned in the wind. Escape flight when flushed is zigzag.

Striped chorus frog, Pseudacris triseriata (pseu dack riss). This is the one calling here. They need ponds of water for about six weeks, then can live the rest of the year in wet grass.

Kevin says this is one of the best years ever at Crow Valley. The wet weather causes a lot of eastern warblers to wander west.

Africa 1995 starts below

## Africa 1995

### East Africa

June 15. Left Fort Collins 6:45 a.m. Left Denver on US Air 1104 at 10:15 and had a quite long wait out on the DIA runway because the loaded plane could not cross an incoming traffic lane. We changed planes in Pittsburgh, although the one we were on was also going to LaGuardia, and barely made it because of the Denver delay.

There was a fine view of the Statue of Liberty and Manhattan on the way in. We arrived at LaGuardia to find that our luggage had remained on the first plane and we had to wait for it. Given free meal by U.S. Air while we waited. Took Carey limo to JFK and tried to check our bags on British Airways, to no avail. Spent night at JFK Hilton near JFK airport, rather dirty for \$97, which was half price on a frequent flier coupon.

June 16. Friday. Flight to London, Heathrow on British Airways 178. Seated beside us was a botanist working with Kew Gardens in montane flora in Kenya, though now working mostly out of a museum/herbarium in Nairobi.

Night at Ibis Hotel, £38. They now charge £1 for the courtesy bus!

June 17. Saturday. Flight to Nairobi on British Airways 67. There was a spectacular overflight view of the Sahara Desert. We flew for half an hour with no signs of humans, or of any vegetation. Then we would fly over perhaps a road or a pipeline, a straight line north-south down the desert, and another half an hour before sighting anything else.

Then we flew over Lake Nasser, the lake behind the Aswan Dam. This is an enormous lake with many arms and fingers, starkly there in the middle of the desert. After that more flight over now featureless desert. Then it got dark.

Met at Nairobi airport by Chris Michaelides (P. O. Box 48010, Nairobi, Kenya. Phones: 254 2 521042 or 212861 or 212957. Fax 254 2 520358). Taken to Hotel Jacaranda for the night, where we stayed the next few days. \$96 per night, with good breakfast. Michaelides is friend of Eugene Decker at CSU, though Decker no longer leads wildlife seminars in Kenya, considers it too dangerous. Decker had advised me to use him as a guide; too dangerous to arrive in Nairobi on my own at night. Michaelides is Greek, born in then Tanganyika, or even German East Africa (now Tanzania) and had farms that were appropriated and nationalized. Has a brother in Idaho and owns lands himself near Colorado Springs. He may come to the U.S. next year.

June 18. Sunday. There were Hornbills (species ?) in the tree outside the window, eating berries. White necked ravens. Pied crows also. Later, a kite in the hotel yard.

We went to the Greek Orthodox Church (Agioli Anargiri Orthodox Church) with Michaelides and his wife. About thirty people there, perhaps one third black. Ornate and liturgical. Then Michaelides took us to the Presbyterian Church, at Madaraka. This is in the Africa Evangelical Presbyterian Church, a conservative denomination. (P. O. Box 7554, Nairobi. Phone 503807. Heard Tom Austin preach, much too long a sermon. Afterward met John Shane, Urban Ministries Support Group, P. O. Box 60875, Nairobi, Kenya. Phone: 254 2 56 4046. Fax 72 16 44. Also met his wife. She went to King College and was raised in First Presbyterian Church, Kingsport, Tennessee. She is related to the Professor Beatty who taught German at Davidson. She knew Allen Dryden, architect who built Walnut Grove Church. Shane has edited a Nairobi Networker: A Church

Worker's Directory. He gave me a copy which I subsequently left with Michaelides.

We lunched at the China Plate in a rather more expensive lunch than I preferred. Bought a jar of mineral water there and subsequently carried the jug through the rest of Africa.

In the afternoon we went to the Karen Blixen Museum and home. Some of "Out of Africa" was filmed here. Jane was reading the book during the course of our Kenya travels. Saw the Ngong Hills, like knuckles on the horizon (which is what "Ngong" means).

Nairobi means "cool waters." Nairobi is on the equator, though it is high, 7,000 feet. Kenya does not have the European seasons, summer and winter. Instead they speak of long rains (March through June 15) followed by a cool season (July/August) and then short rains.

"Safari" is Swahili for "journey."

June 19. Monday. In the morning, we visited the United Nations Environment Programme (UNEP) building outside Nairobi. Nice grounds. Talked to Sylve Campagne, who seemed familiar with the operation there. She does personnel management. There are 242 professional people there, 84 nationalities. 481 Kenyans work there, largely in general service capacities. They operate about 170 conferences per year with international persons coming in. Also in this building complex, there are the UNICEF offices for Kenya. We went there and talked to Dr. Kopano Mukelabai, officer in charge.

At noon, we went to the University of Nairobi to meet Odera Oruka, professor of philosophy. He has taught philosophy here for 24 years, and does environmental ethics. He has an M.A. from Wayne State University in the U.S. and a Ph.D. from Uppsala in Sweden. He is increasingly interested in environmental ethics. His father had ten wives and 36 children, 18 boys and 18 girls. He was born in 1944. Had lunch with him on the patio of the United Kenya Club.

After lunch, I toured the library, with a rather old philosophy collection and lots of religion books. They seemed mostly hand-me downs from clergymen and missionaries. None of my books were in the card catalog but daddy's commentary on the pastoral epistles was! The bookstore was closed for renovations.

We met two of Oruka's students:

F. Ochieng'-ODhiambo. Tall, he was my guide through the library.  
Patrick M. Dikirr, doing his Ph.D. in environmental ethics.

The black buses here are "matatus" from the word for "three." The ride was once three shillings.

At my request we drove through River Street, a seedy and raucous business district.

We visited the St. Andrew's Church, originally a Scottish Presbyterian Church and now in the Presbyterian Church of East Africa. This is the mainstream Presbyterian Church here, rather than the evangelical one to which we were taken yesterday.

June 20. Tuesday. Went to Post Office.

We visited the East African Wildlife Society (2nd floor, Museum Hill Centre. Mailing address: P. O.

Box 20110, Nairobi, Kenya. Phone 748170. Fax 746868). Michaelides is a member of this society. Talked to Aaran Eric T. Hanha, membership officer, and Diana Sigei. They have 7,000 individuals and 300 corporations as members, about 3,000 are East Africans. Their membership turnover in a decade is about 13,000. Membership in U.S. \$ is 38. Their main publication is Swara (the Swahili for impala), and they print 10,000 copies. They also publish, through Blackwells, a scientific journal, the African Journal of Ecology.

7.8% of Kenya is wildlife sanctuaries by area. Kenya had a population of 6.5 million in 1963 at the time of independence. In 1995 the population is 24 million. The biggest challenge is wildlife/people interactions, but no longer poaching.

We left, to go to Kenya Wildlife Services. En route, at our request, we drove through a nicer black subdivision, and there were stalls/shops on the way in. Jane talked with women in a sewing machine stall.

We continued to Kenya Wildlife Services. Talked to Joe Kioko. Their offices are at the gates of the Nairobi National Park. Richard Leakey had these buildings built. He was dramatic in the wildlife service, stopped poaching, and has since been forced out. But the service has not much changed, according to Kioko. Again, their biggest problem is not poaching but wildlife/people interactions. The Masai people do not eat wild game. They think God gave the cows to them. That is why some of the best sanctuaries are in Masai country.

African pied wagtail about the grounds here.

Nappia grass. Many were carrying bundles of it about to feed their cattle. Ground squirrel, seen about the grounds here.

The Rift Valley in Kenya is the same geological formation as in Israel. This valley runs 8,700 km. from Israel and the Dead Sea to Mozambique.

Mt. Kenya is the only place in the world where there is snow on the equator. Tourism is the largest foreign exchange industry.

We lunched in a pizza place in a very nice, brand new shopping center.

Continued to the PCEA Kikuyu hospital. This is about 50 km. north of Nairobi in a quite rural area, somewhat past the village of Kikuyu. Hospital is spread out in a number of one-story buildings, looking as much like a conference ground or camp as a hospital. No sooner had we walked on the grounds than Stan Topple walked by, the head physician here, with whom I was in Davidson College, over forty years ago, and I could still recognize him. Dr. Stan Topple, PCEA Kikuyu Hospital, P. O. Box 45, Kikuyu, Kenya. Fax 254 154 32413. He is the surgeon here, especially for orthopaedic surgery. He was in Korea many years, has been here six years or so, along with his wife, who is a dermatologist, and Norwegian, Mia Topple. He met her in Korea. He has found especially important the support of the Medical Benevolence Foundation, Houston, TX. He gave us a tour of the hospital. We walked through one of the patients' and children's wards. There is a lot of club foot in African children; he thinks it is the result of inbreeding.

As we left, met Glen James Hallead, coming up from Nairobi. We were later to see him at Mt. Kenya Country Club. He coordinates visitors from the U.S. They have had perhaps 100 so far this

year.

Leaving the hospital complex, we went to see the nearby Church of the Torch. This is a large, Gothic church, somewhat curiously placed on this rural African landscape. We met coming out a man named John Ngethe (Kikuyu Nursery of the Primary School, Box 198, Kikuyu, Kenya). He was a teacher, is now clerk of session in the church. We walked with him to the old church, white, built in 1908 or so. Then we went to a nearby school with small children and visited several classrooms. They have few or no materials to work with and no electricity.

Returned to Nairobi, stopping at a coffee plantation on the way back. Some donkeys seen along the way. Then we went to Chris Michaelides' home for tea. A buffalo skull and horns is on the outside of the house, this one nearly killed him. He shot two buffalo that were giving trouble in crop fields and tracked one of them into the woods. It charged and he pushed its horns down and was thrown entirely over it.

Inside, he showed us a python skin, some 16 feet long. This too nearly killed him. It got him and was squeezing him, even though he shot its head up. A friend helped him get out. He had one broken rib from the squeezing. We called home and got Shonny from here.

On returning to the hotel, the kiosk shops that were nearby had been torn down.

June 21. Wednesday. Breakfast at the Jacaranda Hotel. Stored luggage there, then took taxi to the Norfolk Hotel. Checked in. We were soon called for a briefing at 10.00 a.m.

Tour members:

Dorothy Minnucci, 305 Ferris Lane, New Britain, PA 189091.

Jerry Minnucci, 1682 Caminito Playa, Glendale, CA 91208. Her son-in-law, who often travels with her. He is in television motion pictures.

Pat Jubb, 3455 Hartsock Ln, Colorado Springs, CO 80917. Her husband, formerly, was in the navy. Retired in Colorado Springs.

Susie Wittier, 10385 Raygor Road, Colorado Springs, CO 80908. Schoolteacher, doing mostly guidance.

The Norfolk hotel opened Christmas in 1904. Teddy Roosevelt, when ex-president in 1909 left the Norfolk on the biggest safari ever to leave here, 500 porters. He went through Uganda, Kenya, the then Belgian Congo, and the Sudan. He was gone several months.

Then we walked around to a bookstore, Text Book Centre to which Michaelides had earlier taken us, very good bookstore. I bought the Serengeti book, Savage Paradise, and mailed it home. It cost as much to mail it as to buy it. Back to hotel room for lunch.

Then we walked to town and browsed shops. The town is full of shops with lots of hawkers trying to sell safaris to you. I bought a broad-brim hat. Back at hotel, I phoned CSU philosophy dept.

June 22, Thursday. Our tour guide is Abraham, or Ibrahim. We drove north in a good minibus. Passed Kenyatta University, on the edge of Nairobi. Drove by lots of pineapple plantations, owned

by Del Monte. In the wetland area is papyrus, and various people had cut this and had it for sale roadside. Saw passion fruit, a vine.

Somewhat surprisingly, American maize, corn, is grown everywhere. It was all over Nairobi in the idle ground between the roads and the fences, and is here in great fields, as well as planted on road cuts, etc. People along the roadside roast it and have it for sale. Also there are mango trees. Banana trees are everywhere, but I saw surprisingly little in fruit, though bananas are everywhere for sale.

We reached Aberdare Country Club. Lunch. Lovely country club on hillside setting. Treetops is reached from here, which is inside Aberdare National Park, where people view wildlife (here commonly called "game") from an elevated lodge, even sipping cocktails as they view game baited to come in for the evening. You have to go in with a four-wheel drive and a guide. Various people here went but we did not go, presuming we will see more wild game later. It was at Treetops that Queen Elizabeth learned that she was Queen of the United Kingdom, her father having died the night before.

We took a nature walk in the afternoon on the Aberdare game reserve. African pied wag-tail. Bronze sunbird. Hunter's sunbird. Ring dove. Heard but hardly saw, more than a flurry in the bush, suni, a pygmy antelope. Tropical boubou. Down the trail, the forest opened up into a field where the wildlife was more visible. Reticulated giraffe, an unusual species here, not the common giraffe elsewhere in Africa. The common giraffe have white lines that end without contacting any other lines but this one is "reticulated," that is, all the white lines join another white line for a more defined or geometrical effect.

Also seen here: Burchell's zebra. Jackson's hartebeest. Impala. Warthogs; their tail goes straight up in the air when alarmed. Grant's gazelles. Thomson's gazelles. Thomson's gazelles are smaller than Grant's, Grant's is smaller than an impala, which is not all that big itself. Thomson's have tails that twitch all the time, and a broad black band along the flank. Grant's have a white strip that goes way up the rump, which is not on impala, also Grant's have less curved horns than the impala.

Also seen here: Ostrich, there is now only one here. Earlier, they had 6-7 but these gave trouble with tourists. Dusky flycatcher. Cinnamon breasted bee-eater. On the trail on the way back, safari ants. Fiscal shrike. White-eyed slaty flycatcher. Black-headed heron. Speckled mousebird (looks somewhat mousey and reminds people of a mouse the way it works around a tree). Blue-throated sunbird. Blue-eyed glossy starling. On the way back, near the servants' quarters, there were common rats about, out toward the golf course.

Later, in the evening, returned to the golf course area briefly. Hadada ibis (spelled Hadeda in South Africa book). Later we were to see lots of these, with one of the most familiar calls in certain parts of Africa. Ha-ha-ha-dah-ha. Noisy in flight.

Jacaranda mimosifolia is in the Bigoniaceae, from Brazil.

Sisal is Agave sisalana, from Mexico.

There are nicely landscaped grounds here, with various imported plants. Seen here: Moonflower or Angel's trumpet, Datura suaveolens, from Mexico.

Bougainvillea. Many kinds, all with three colored bracts subtending three inconspicuous flowers. Originally from Brazil, found in Rio de Janeiro by Bouganville.

Hibiscus. Yellow anthers and red stamens. From China.

Bird of paradise (flower). Strelitzia reginae, from South America.

In the countryside about, lots of thorn trees. Flat topped Acacia, 42 species in Kenya.

July 22. Thursday.

I took alone an early morning walk back down the game trail. Hartlaub's turaco (toor rah ko), seen quite nicely. This is the bird on the rear of the Collins Birds of East Africa.

We left Aberdare, drove to Mt. Kenya Country Club. Thomson's gazelles. Lots of wheat fields. Reached village of Naro Moru; this is the base for climbing Mount Kenya, which is 17,058 feet in elevation.

Went to a market on the equator, with so much hassle from people selling things that it was no fun.

Long-tailed widowbird, with spectacular tail. Several seen from the van. Tail is so oversized you would think it a burden in flight. But it attracts females. When researchers glued more feathers to a male's tale, more females were attracted to nests in its territory. But they jettison the tails after breeding season.

We reached Mt. Kenya Safari Club about noon; this is also on the equator. There are birds all over the lawn and lake. Marabou storks, quite large with air sacs. Egyptian geese. Sacred Ibis; sacred in Egypt, where it is now extinct (!), but still present here. Black-headed herons. Grey herons. Hooded vulture. One exotic here: the Saras crane from India.

We stayed in a rather nice cabin some walk away from the dining hall. Servants built a fire at night. This is high enough in elevation to be cool at nights.

Bird walk in afternoon, at 4.30. Speckled mousebird. Fiscal shrike. I couldn't trace out the origin of "fiscal" here. By one account "fiscal" went back to fisk, a public prosecutor, and was taken to mean "hangman" from the shrike's hanging lizards on thorns, though by another account the shrike has lots of lizards in the bank and is "fiscally" well off.

Yellow-billed duck, on the pond.

Reichnow's weaver. Yellow. Weavers are about like finches, though they have ten rather than nine primaries. Both are seed eaters with large bills. This is a large bird group in Africa. Finches build open nests. With weavers the male builds the nest, while the female sings. The nest is a domed structure, with an opening at the side, top, or bottom. Then the male sees whether the female likes the nest; if not he has to build another! They are colonial and acacia trees are frequent here laden with weavers' nests.

Hadada ibis. Bottlebrush tree, with red hanging flowers. Wild Ipomaea, like a purple morning glory.

African lily. On one jacaranda tree, a branch was in flower. African greenheart tree. Canna lily, which is orange red. Lantana, with yellow flower. Olive thrush, like an American robin, and thrush-like call. Mexican weeping pine (Pinus patula). Bamboo. African cedar, like a cedar. African wild olive, Olea africana, which often has ant's nests made of mud in it. Blue-eyed glossy starling. Blue-throated brown sunbird. White-eyed slaty flycatcher. Mosque swallow; brown below, forked tail. Black rough-wing swallow. Gallinsoga, the same weed we have in the U.S. Thorn tree, Acacia. Acacias are preferred by elephants, who eat the trunk bark. Umbrella acacia, which giraffes prefer, with leaves they can eat on the top. Tacanthus camfereta, whitish leaves, mostly on savanna grassland. Robin chat, seen well in deep brush. Olive pigeon, with yellow beak and yellow rings around eye. Cattail swamp. Black crane, like a gallinule, seen well walking on water lilies. Northern double collared sunbird. Tacasse sunbird, very black. Streaky seedeater, like a sparrow. Podo tree, somewhat pine like.

Tropical boubou, really a shrike, same genus, with a call like a mockingbird, and a gurgle sound.

Little grebe, swimming on a pond where we hoped to see fish eagle and kingfishers, but did not. Silky oak. Grevillea robusta. Parasitic fern in wild olive.

Yellow-vented bulbul. (Note that there is both a boubou and a bulbul, seen here moments apart.) This is like a thrush. Also called black-capped, or common bulbul. Often in gardens and one of the commonest birds in Africa. With a yellow patch under tail, where it vents. There is only one bulbul here, lots more in South Africa.

Stinging nettle.

Moi University, at Eldoret has a program in wildlife conservation.

My guide is Sammy Ole Ntete, Mount Kenya Safari Club, P. O. Box 35, Nanyuki. He hopes to study wildlife conservation; was a guide at Masai Mara, but took this job instead, where he can make more money and go back to school.

June 21, Saturday. Samburu Game Reserve.

There were lots of wheat fields on way north. Lots of acacia trees with weaver nests. We reached Isiolo, a town, where the good blacktop road stops. The road thereafter is quite rough and Abraham drove rather too fast. There is a mosque in Isiolo; most of the people here are Muslims. Eventually, we turned off the main road on north, which goes to Ethiopia, getting rougher as it does (so Abraham said). We turned onto a still rougher dirt road.

We visited a Samburu village. The Samburu in northern Kenya are a tribe closely related to the Masai in southern and western Kenya. They keep lots of cattle in semi-arid areas, venerate the cows and have taboos against eating wild animals, which is one of the reasons that wildlife sanctuaries succeed in their areas. They separated from the Masai about 200 years ago.

We reached the Samburu Game Reserve. The reserve is arid country alongside the Ewago Ngiro River, a through river.

Yellow-necked spurfowl, rather like a francolin.

Gerenuk - a very long necked antelope, giraffe-necked antelope. Several seen well here, and nowhere later on the trip.

Oryx. Several seen

Grevy's zebra

Nile crocodile, several in river

Olive baboons, frequent during the day

Tawny eagle

impala, many of them

Grant's gazelle (first pix here)

warthogs

superb starling, quite a striking bird

impala male in shade (pix)

dik-dik (pix). Lots seen here in Samburu and few seen later on the trip.

gerenuk, more of them

dik-dik (and better pix in sun)

dik-dik, two, one in the shade

impala, one male in sun, in a group of two dozen

1 vervet monkey (pix)

2 vervet monkeys grooming on log (pix)

waterbuck. These were first seen here, often seen later in Africa. Dark brown, shaggy, with a white ring (a "target") around its rump. (pix, and better pix later).

Leopard. Seen in tree; we could make out the silhouette and the black spots clearly, though it was a dense tree. This was my first leopard, and we were only to see one other later (and much better) in the Serengeti (see later). (pix). This is the first of the African big cats for me, but lions were to come a few minutes later.

Lions! Very soon after, eleven lions, four females and the rest cubs. Lots of pix and changed film here. They had no fear of the vehicle and came right by; we listened to the sound of their feet hitting the sand. They roamed around a bit, then gathered in the shade of a tree not far way. We were the only vehicle in the vicinity.

This makes the big five for me; In 1990, I saw elephant, and buffalo at Addo, one buffalo only on the night drive there. I saw two white rhino at Tembe in South Africa. But I saw the two big cats here within a half an hour. Lots of lion seen subsequently, but only one more leopard.

Baboons in tree.

Elephants in the river. This was a splendid sight with a good sized group, wading across river, then wallowing in mud on the other side. They were some distance away, but you could hear them in the water.

Lunch. There is a lodge to stay in here also. There were red-billed hornbills, which had to be

chased away from the lunch area. Others seen later; they are common in dry river beds.

After lunch, oryx, seen several times.

Giraffes (pix)

Elephants (pix)

Ground squirrel

Waterbuck (pix in good light)

Crowned plover

Hooded vulture

Vulturine guineafowl (pix)

Ostrich - maybe 12 seen; these are wild. We had passed an ostrich farm earlier in the day.

Drove back to Mt. Kenya Safari Club. Flat tire on the way.

We saw various camels along the way; they are raised here and sold out of the country, often in Arabia, and Arabians may own the ranches on which they are raised here.

I jogged around the grounds.

June 25, Sunday.

I took, alone, an early morning walk in the area walked with the naturalist on Friday. Anhinga at the water's edge. Mountain wagtail, walking on water lilies, a pair. Wagtails are rather like pipits in the U.S., which also wag their tails. Some of the same birds seen Friday, seen again; good look at robin chat especially.

The room tariff posted at the Safari club is full board, \$ 438 per day! But probably not many of the tour groups actually pay anything like this.

We drove to Sweetwaters Camp, and had a game drive on the way in. This is a private game reserve, in the Laikipia area, not far from Mt. Kenya, which is quite visible from here. We were in a tented camp, that is, a fancy tent with a permanent bath at the back, but you do sleep under canvas and a thatched roof. Across the way was a waterhole to which game variously came. An electric fence, inconspicuously buried in a recessed trench kept the animals out. The camp generates its own electricity, 240 volts, and the electricity is only on for part of the evening.

Seen during the drive on the way in:

Burchell's zebra, the common zebra (pix)

Black rhino in captivity. (pix)

Rabbit, or hare

Thomson's gazelle (pix of a group at some distance)

Checked in. Lunch

Rothschild's giraffe (pix at waterhole)

Candelabra tree, Euphorbia candelabra, the "cactus" like tree. Leafless.

Acacia xanthophloea, the Fever tree. Early Europeans associated it with malaria, since it grows by water, with mosquitoes, at a time when the association between malaria and mosquitoes was not yet known.

I took a bird walk on my own, as the naturalist was too expensive.

Blacksmith plover. The call, a tink, tink, tink, is said to be like the sound of a blacksmith hitting an anvil.

Yellow-billed stork

Superb starling

White bellied go-away bird (a turaco), nicely seen perched on a bare limb. Large crest, grey, and white, long tail.

Yellow-necked spurfowl (a francolin)

Golden-breasted bunting

Black-winged plover

There are 19 black rhinos on the reserve. All the indigenous rhinos in Kenya were black, though some whites have now been sent to Kenya from South Africa.

There are 60 elephants here, on an experimental basis for family planning.

An eland came in to drink at the waterhole.

Senegal plover

Scarlet-chested sunbird

baboons at the edge of camp

In late evening, we took a dusk and night game drive:

zebras

elephants

some kind of eagle

jackal - black-backed, running across the road

Grant's gazelle

giraffes

waterbuck

Jackson's hartebeest

Bushbaby (Galago) - hardly seen, just eyes in the dark. But this was the only such occasion on the trip. This is a lower primate, or prosimian, with large ears, greatly elongated hind limbs, and long tail. Active at night. Call said to be like a human baby. (call is on Calls of the Bushveld tape.)

Serval, a slender, long-legged cat (genus Felis), seen briefly in the dark. Again, the only such occasion on the trip. About the size of a house cat with extra long legs.

Spotted hyena, seen reasonably well in the dark. Lots of hyena seen later in the trip. (British spelling - hyaena)

buffalo. Two seen pretty well in the dark. So far I have not seen a buffalo by day, but more were to come later in the trip.

June 26, Monday. We drove back to Nairobi and took the flight to Masa Mara.

There was a lovely view of Mt. Kenya from the tent in the early morning. The mountain tended to become cloudy during in the day, but was clear in the early mornings.

Lilac breasted roller. Stunning bird. Called a roller from a flight display where it circles around with a great drop and around and up again.

On the way driving out of the reserve:  
troop of baboons  
elephants.

We Drove back to Nairobi, and returned to Norfolk Hotel, to leave luggage, since we could only take 33 pounds on the Masa Mara flight.

Lunch at the Carnivore Restaurant. I ate zebra, ostrich, and crocodile.

Short drive to Wilson airport, and about an hour's flight west to an airstrip serving the Mara Safari Club. Met by guide there; his name is Naftali.

There was a troop of fifty baboons along roadside on the way in to the lodge, with lots of small ones in the troop.

The lodge is a tented lodge overlooking the river, which has hippos in it.

The lodge generates its own power. There is solar hot water, but it is only hot in the early evening. There is no phone service here, though they have emergency radio contact with the outside. They can talk to planes coming in bringing their guests.

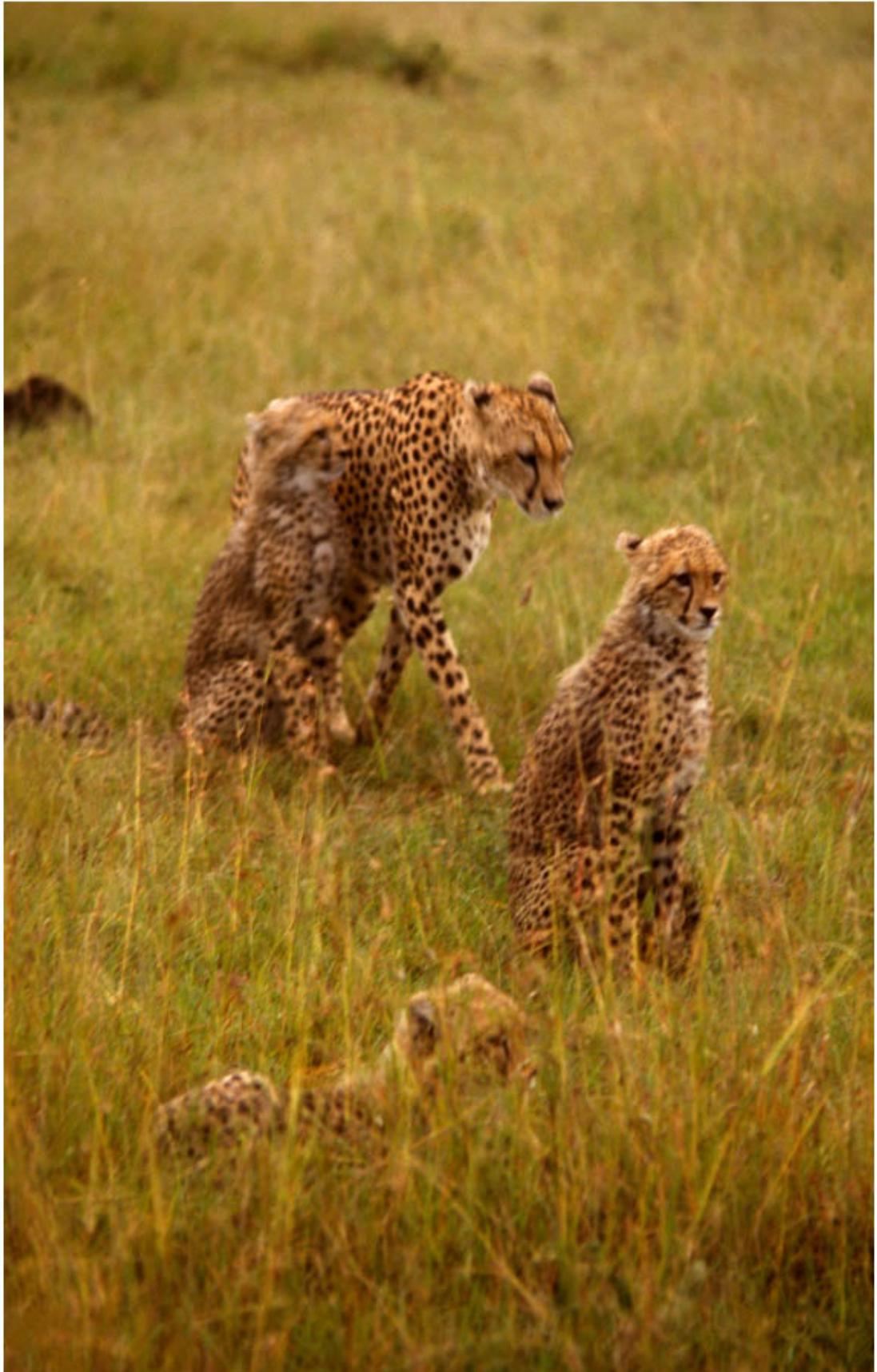
We took a game drive from 4.00 to 6.30 p.m. The area we are in is not really in the national park, but to the north of it. According to the locals, nevertheless, this is where the game currently is. This is the Ol-Choro-Orowa Conservation area, another spelling is Ol Choro Oiroua, actually a private ranch. "Siringet" --this is the Masai name for the area, means an endless plain. The border was closed in 1977, and Masa Mara developed as a tourist attraction only after that. Earlier guides were operating out of Kenya and Tanzania was not making any money off the tourists, even though most of the Serengeti is in Tanzania.

zebra (pix)  
topi (pix). We first saw topi here, a handsome animal, lots of reddish blue color.  
Wildebeest.  
Thomson's gazelle. Several hundred  
Grant's gazelle. Several dozen.  
Crowned plover  
White-bellied bustard  
Black-backed jackal (pix).

The highlight of the evening was a mother cheetah with four cubs. She was resting on a little raised mound, in a marvelous pose. She did not seem to mind several vans around her, though they had all to stay on one side.

impala  
old male elephant  
giraffe, the common one, though they here called it the Masa giraffe. Some white lines do not connect.





francolins  
 egret, unidentified  
 eland  
 zebra  
 helmeted guinea fowl  
 ground hornbill, a big one with red face and throat wattles.

The wild dog is extremely rare here, and any sightings are to be reported.

June 27, Tuesday. Occupied all day with three game drives at Masa Mara.

Up at 6.00 a.m. and out. Grant's gazelles, bustard, zebra, 24 eland, with a three months old baby one. 5 giraffes. 3 elephants. Topi. Black-headed heron. Superb starlings. Lion and lioness. Topi (pix). Wildebeest (pix). Thomson's gazelles. Eland. Black-backed jackal. 5 giraffes. Goshawk. Warthogs. Baboons. Eland. Lion. Back in for breakfast.

Another drive at 10.00 a.m. There are 1.4 million wildebeest here, 200,000 zebras, 700,000 Thomson's gazelles. There are 26 herbivores, 20 carnivores, 4 primates. The short rains are November through December. The long rains are February through May. Rare here are: leopard, roan antelope, rhino, wild dog. The wildebeest population is up five times since the 1900's when they were first counted, then presumably decimated by rinderpest, introduced by colonial cattle. When removed from the cattle it disappeared from the wildebeest.

There is a famous migration, really a big sort of circular movement, though the exact routes taken vary from year to year. December through May the wildebeest are in the Masa Mara. June and July they move to the northwest Serengeti, and by August through November they are far south in the Serengeti. This is essentially a migration following where the food is, or where they sense food might be; they seem to follow thunder and rain clouds. An individual wildebeest may walk 3,000 km. One gets different answers about which month to see them where. There really isn't a beginning and an ending to the migration; they are always moving. About 1.25 million wildebeest migrate. About .25 million will die during the migration. About .5 million calves will be born at the same time, and only about half the calves will make it.

The wildebeest all drop their calves about the same time, late-January through mid-March. This is thought to be a protection against predators, which can only take so many and then are too glutted to eat more. The calves are often separated from their mothers and lost. But other mothers, who have lost their calves, will not adopt them.

Hyenas are far the most numerous predator, there are perhaps 3,000 on the Serengeti-Masai/Mara.

Continuing, mid-day game drive:

51 hippos  
 bateleur eagle  
 topi  
 large herd of impala

The guide took us in to see some protected white rhinos, brought in from South Africa. Armed guards around them. There are now eight here; there were ten. Two became ill and were sent back for treatment. In a pen was a female with a three week old calf.

There were 500 black rhinos in the Serengeti-Mara in decades past, now all are gone except for 30 or so.

12 eland, with yellow-billed oxpecker (pix)  
40-50 zebras  
helmeted guinea fowl

There was not too much moving around in the middle of the day.

Kenya has the richest avifauna in Africa and the third richest in the world.  
Return to camp.  
Long-crested eagle. Seen perched over the river from the tent site, before lunch.

The most common grass is Red Oat Grass, Themeda trianda. The most common tree is Acacia gerrardii.

Afternoon game drive:  
secretary birds (pix of these)  
30 crowned cranes (pix of these)  
little egret  
lilac breasted roller

5 lions  
1 male with 2 females  
1 male with 1 female

Pretty steady rain developed; we had to put the top on, then watched the lion and lioness in a hard rain.

wildebeest - couple hundred  
Thomson's gazelle  
impala

(I changed film here, in the midst of trying to photograph a sleeping hyena, and left the back open by accident. Re-loaded and went forward 5-6 frames. I was confused by the fact that my cable release was broken and at first I did not realize what was the matter.)

Hyena (pix)

Cheetah. Mother and 3 cubs. Watched them in the rain (pix). Apparently not the same as the one with four cubs seen yesterday.

Hyena (pix)  
Augur buzzard, perched in tree. Face pattern like a falcon.

Return to camp. Slides of the Maasai shown that night.  
July 28. Wednesday. Drizzling rain at first.

Early morning ride. 10 lions.

2 males, old males  
3 females, with cubs.

The darker the mane, the older the lion.

Another pride, with 11 lions, young males (pix).

elephants  
zebras  
Thomson's gazelles

Cheetah and 3 cubs, presumably the same one seen before.

Hundreds of Thomson's gazelles.

Topi.

Many antelope like the short grass areas, where they are safer. Tall grass hides lions and predators.

3 hyena  
1 hyena asleep  
wildebeest, several hundred.

500 Thomson's gazelles.

Male and female lion.

2 black backed jackals (pix)

2 secretary birds.

Then we went back to camp and checked out; and were taken to the airstrip about midday. We waited some time at the airstrip for the plane. The plane is a Twin-Otter, made by De Haviland in Canada, a subsidiary owned by Boeing. On the flight back in some areas two-thirds of the landscape was planted in maize.

We flew back and returned to Norfolk hotel. We toured downtown with two women from Texas. I tried to buy a cable release, which had broken; none available.

We had a tour of the National Museum. I made a tour of the snake pit; Jane did not. Shonny phoned. Henrietta phoned, from CSU.

July 29, Thursday. Trip to Tanzania begins, trip to Arusha and Lake Manyara.

We had a fine breakfast served early in the room, because we had to leave too early to get the ordinary breakfast. Left 7.15 to drive south.

There is more industry on the south side of Nairobi. The first part of the drive is the same as the

Mombasa road. Then we took the Arusha road, blacktop though with a good many potholes in it.

The elevation lowers and the country dries out. There is grassland and waist-high acacia trees. Lots of it seems uninhabited, though there are occasional houses. We reached the town of Kaijado, by now there are many full-sized acacia trees. More goat and cattle herds. This is Masai country.

ostrich

genet - seen killed on roadside, common genet

2nd genet, killed

striking termite mounds here.

Further south, there are mountains on both sides of the road, the Nmarga mountains.

Reached the border and transferred vans. A crazy border crossing with people, on the Kenya side, pushing from every side to sell you something. The new guide is Peter Neema, the van is a Nissan van, with Ranger Safaris, operating out of Arusha. He was our guide throughout the Tanzania tour and we were the only ones in the vehicle. Peter Neema, Box 10108, Arusha, Tanzania.

Tanzania was German East Africa prior to World War I, then made a British mandate, called Tanganyika from 1920 on, from WW I until its independence in 1962. When it combined with Zanzibar, later in the 1960's, it took the name Tanzania. Zanzibar was since 1890 a British protectorate. Julius Nyere was first president, president for 20 years, committed to radical socialism, always in the forefront of African liberation struggles. He tolerated little dissent and, at the same time that Tanzania harbored many exiles from elsewhere in Africa, Tanzanian jails sometimes held more political prisoners than did South Africa. The country has remained generally poor, getting worse, and socialism is still the rhetoric, capitalism increasingly the practice, although it is mostly a nation of small farmers.

Tsetse flies made most of central and southern Tanzania unsuitable for agriculture and stock and the British mostly neglected it.

Continuing, driving south to Arusha. The road on the Tanzania side is better than on the Kenya side. More arid country, still Masai country. More donkeys.

dik-dik

reached village of Longido

6 zebra (pix)

pale chanting goshawk, on ground, nicely seen

Masai with their cattle

Mt. Meru, seen in distance, above the clouds. This is itself a considerable mountain, 4,556 meters or 14,943 feet, which is higher than anything in Colorado. This in Arusha National Park, and a volcano, with a crater and a cliff face of 1,500 meters. (This is not to be confused with another Mt. Meru in northern Kenya, not far from Mt. Kenya, where George and Joy Adamson were, of "Born Free" fame.) Because it is near the equator there is not year-round snow on it, though there is much snow at various seasons. Seen still better on the return trip.

Mount Kilimanjaro is nearby, not seen today, 5,895 meters, or 19,335 feet, over 5,000 feet higher than anything in Colorado. Climbers usually suffer from altitude sickness. It is a volcano. Seen



somewhat better on the return trip, and seen again, best of all, from the plane later, flying from Nairobi to Johannesburg.

In Tanzania there is a College of African Wildlife Management at Mweka, a village 10 km. north of Moshi (100 km. east of Arusha) and south of Kilimanjaro National Park. This village is not shown in my big Freytag and Berndt Kenya-Tanzania-Uganda map, but it is in the Lonely Planet, East Africa guide, p. 606, p. 611, with mention of the College there. One of the favored trails up Mt. Kilimanjaro starts from here. Ron Engel's friend, Tom Gilbert, taught there; Gene Decker says it was once better, is now no good.

Bat-eared fox, killed roadside.  
This is still Masai country.

Big ostrich farm.  
Logs hanging from trees are beehives.  
Augur buzzard.

As you near Arusha you climb and there is more vegetation. Much better watered, now maize and bananas appear.

Drove through village with market (pix).  
We reached Arusha, and drove through Arusha some 10 km. out of town to lunch at the so-called "Mountain Lodge," though there is no particular mountain nearby, on Lake Duluti. Met Keith James, from Wales, the general manager of Ranger Safaris. Arusha is very much a third world city. The Tanzanian shilling (about 550 to \$1) is very differently priced from a Kenyan shilling (about 52 to \$1). That is a tenfold difference, and represents something of the difference between the two countries. Kenya did not nationalize landholdings at the time of independence, although Kenyatta had said he would he reversed himself. Tanzania did and insisted on a socialist economy, which has not worked, and lately they have been backing off into capitalism.

After lunch, went to the bank to change money, to the post office, and to a camera store, where, to my surprise, I found the cable release I could not find in four Nairobi stores.

Ranger Safaris, our tour group, has 100 vehicles, 100 drivers.

Arusha is halfway between Capetown and Cairo, with a roundabout in the center celebrating this.

We left to drive toward Lake Manyara, and the Serengeti. There is a good tarred road for an hour or so, until you reach a junction at Makuyuni, then a rough dirt thereafter for the rest of the trip. Sedans disappear and there are only four-wheel drives.

Tawny eagle, you tell it because it is dark brown and by size.  
6 ostriches  
The country is drying out, but there is still good grass,  
few acacias.

Baobab tree, a famous tree. Genus: Adansonia. Odd looking, massive trunks and very contorted. Pix in Blundell, Wild Flowers of East Africa, pl. 53 and 54. They live 1,000 years, some say 2,000

years. They have leaves only in the rainy season. They cannot survive frosts. According to the Palgrave book on trees (see below), the tree is short and grotesquely fat. There may be annual rings or a sort and large ones may be 3,000 years old.

Namaqua dove, seen at dusty roadside, small and long tail.

This drive is now through the Rift Valley. The country becomes again better watered. There are even some rice fields in wet areas that catch a lot of rain before an escarpment.

Lilac-breasted roller  
Yellow necked spurfowl  
Helmeted guinea fowl  
seedeater

We reached village of Mto-wa-Mbu, a rather picturesque and very much Third World village. There is a market for crafts here; we stopped at it on the return trip. The name of the village means "mosquito," or, by some accounts, "gnats." Beyond town, we climbed the escarpment, with a big washout in the lower part of the road, and a rough road the whole way; often you could only creep along on it. Eventually we reached the flat summit of the scarp, and drove on a couple kms. to Lake Manyara Lodge, on the western edge of the Rift Valley escarpment. The lodge overlooks Lake Manyara, far below and 2 km away. The Rift Valley forms a chain of great lakes, including this one. The lodge generates its own power, turned off between 12.00 a.m. and 5.00 a.m. The lodge was once operated by the Tanzanian government, they failed, and turned it over to private hands.

June 30, Friday. Generally cloudy in the morning, later brighter.

There are 120 different tribes in Tanzania. Peter is from the Mbulu district and a member of the Iraqw tribe.

We returned down the rough escarpment road, going to Lake Manyara for the morning. Driving down the road, the lodge could be seen in the distance (pix). Now we could make out thousands of flamingoes at the edge of the lake, mostly seen as a kind of pink haze in the distance, though with binoculars you could see that they were flamingoes. Later we were to see them closer up.

2 waterbucks, in the distance, below, from the road.

Stopped and took pictures of a woman named Elizabeth, carrying an 80-pound bag of charcoal to the market to sell for perhaps \$ 2, walking round trip 12 miles to do so.

Reached bottom of the scarp, and entered Lake Manyara National Park. There is quite a dense forest here, with large trees, perhaps the most dense forest we saw in Africa.

12 baboons. These are olive baboons, as the drivers called them; though there seem to be two species here, the yellow baboon, Papio cynocephalus, the commonest in Kenya, and probably this one; also there is the Anubis or olive baboon, Papio anubis, also found in Kenya. (Anubis was a jackal-god in Egypt, whose pictorial representation the baboon was thought to resemble.) Later in South Africa they were chacma baboons, Papio ursinus, though, despite the book drawings, there seems to be little evident difference between them.

mahogany trees  
 wild fig trees  
 gardenia tree, in fruit  
 tawny eagle  
 2 warthogs, with whiskers. females.  
 papyrus  
 ground hornbill  
 red-billed hornbill  
 silvery-checked hornbill  
 ebony tree

2 lions - female seen better, the male was lying down. These two were seen again on the return trip, with the male now more evident.

Red bishop, a weaver, nicely seen.  
 hammerkop, in flight

We reached a smallish pool, prior to the main lake shore:

Egyptian geese  
 knob-billed duck/goose  
 white-faced tree duck  
 25 hippos in pool

Continuing toward the lake, with lots of wildlife here:

giraffe and month old baby  
 elephant, at a distance  
 dik-dik  
 11 elephants  
 2 warthogs  
 zebra  
 2 dozen impala, 1 male (pix)  
 wild mango  
 vultures  
 crowned plover

There was a field full of 100 or more baboons.

white-necked cormorants, 75 of them  
 African spoonbill  
 African jacana, like a gallinule, with big feet  
 wildebeest and yellow-billed stork (pix)  
 zebras and storks  
 white pelicans  
 marabou stork

Then we reached the lake and somewhat at a distance were millions of flamingos. These are lesser flamingoes. There are more flamingos in the Rift Valley than anywhere else in the world. The "Out of Africa" scene with flamingos was filmed here. Hundreds of pelicans also in the distance.

I took a picture, with yellowbilled storks, in the first (nearest) layer, with black wings, then pelicans (all white) in the second layer (middle distance), and pink flamingos in the further distance.

more baboons.

Return trip.

Lions seen better now.

We drove back up the scarp, and had lunch at the Lake Manyara lodge.  
Baboons were on the grounds at lunch.  
It became sunny in the afternoon.

We drove on toward Serengeti. Reached the town of Karatu and the road improved some. This is a reasonably prosperous looking village, Peter's home. Wheat and barley in the fields. Much maize. There were lots of unfinished houses; people have to build them pay as you go and this can take ten years or more. We were to visit a mission dispensary (hospital) here on return. Still the roads have no sedans on them at all; they are all four wheel drives. We went five or six days without seeing a sedan.

African fish eagle in flight; fine view with white head.

We continued and reached rim of Ngorongoro Crater, but we were not to descend the crater until the return trip. The rim is 7,500 feet and noticeably cooler than the plains below. The crater is 102 square miles, some 10-12 miles across, and contains perhaps the greatest concentration of wildlife anywhere in Africa. No fences are around it and wildlife are free to come and go, though mostly they remain in the crater floor. From an overlook, we could see a herd of 150 buffalo in the distance below. This is the first time I have seen buffalo in the daylight.

Continuing, on a road that skirts the rim. 1 buffalo in the brush, roadside, seen reasonably well.

waterbuck. This one is the Defassa waterbuck, and has a white rump but not the evident white target on the rump of the common waterbuck. 8-10 in a field.

Spotted hyena, coming down through brush at the edge of the road, 15 feet away.

black-shouldered kite

stonechat. White wing, neck, rump patches

Continued, descending, reaching Masai country, which dries out.

Battaleur eagle

superb starling

The acacia here is whistling acacia, Acacia drepanolobium, which is not flat topped. It commonly has insect galls on it, and the wind blows through them to make a whistle. Baboons like to pluck off the galls and eat them.

Sausage tree, Kigelia pinnata = africana.

2 secretary birds

Continuing, we crossed a long, flat, treeless plain, not yet the Serengeti.

Then we reached the Serengeti, which got somewhat greener. Acacia trees.

3 giraffes

60 grant's gazelles

We passed a gate to Serengeti Park, leaving Ngorongoro reserve (pix)

200-300 Thomson's gazelles

We drove past Thomson's gazelles and Grant's gazelles for miles.

Kori bustard, 6-8 of them. The Kori bustard is the largest flying bird, and the largest bird, after the ostrich.

We passed a toll gate area, and paid fees (included in the tour), the Naabi Hill Gate.

6-8 zebras

4 common jackals

1 ostrich

The road now is wet; it has rained here earlier in the day.

Cape rook

The low summits here are called kopjes. Elevated areas with rounded rocks. I never got a very good geological explanation for the origin of these formations.

2 lions seen in distance on a kopje

spotted hyena, nicely seen

many termite mounds

hartebeest

1 lion in the distance

200-300 zebras

4 ostriches

baboon on rock

100 zebras

2 bat eared foxes, well seen

2 topi

Nubian vulture, quite large and flying low.

6-7 elephants, at a distance

black backed jackal.

helmeted guinea fowl, 3 dozen in road

40-50 zebra. It is getting dark, toward sunset.

Another 40-50 guineas in the road.

6-8 wildebeest

another 200-300 zebras.

Reached Serengeti Sopa Lodge.

Tanzania is the second poorest nation on Earth (so the hostess said), and too poor to require half or partial national ownership of international development ventures, such as tourist hotels. This chain is owned by a British man and his wife. But Tanzania does tax these ventures heavily, some 30-40% of profits, a portion of which goes to support the parks. Also there is a \$ 12 per person per day entrance fee.

Serengeti Park is 14,000 square km., about the size of Connecticut. The whole Serengeti ecosystem is about twice that, 28,000 square kms.

July 1, Saturday.

At breakfast, there were many zebras on the plains below. Lodge is situated on somewhat high ground.

Wild dogs are quite rare here. There are perhaps 30 in the park.

It is 210 km., a long drive over bad roads to the Kenya border.

Morning game drive

Leonitis nepetifolia, interesting flower with the stalk straight through the flower, a mint. Picture in Blundell, Wildflowers of East Africa, Collins guide.

pygmy falcon

10-12 impala

150 impala (pix), with some great jumping as they decided to run across the road.

white-browed coucal (a cuckoo)

12 helmeted guinea fowl

baboons

whiteheaded buffalo weaver

6-8 hippos

bare-faced go-away bird

bataleur eagle

3-4 giraffes in distance

12 guinea fowl

Coke's hartebeest, 8-10 of them

18-20 more in distance

ostrich

Continuing, we drove through great expanses of open grassland, which looked like desirable grass, but the animals don't like the tall grass and have eaten out the smaller grasses in between. There are plenty of tracks where animals had been here earlier.

hyena (pix)

lilac breasted roller

75 zebras

1 male lion lying in grass

300 zebras

50 zebras

1,000 zebras on one side of the road

another 1,000 zebras on the other side of the road

Then a third 1,000 zebras more or less in the road, which we drove through slowly, passing into perhaps 1,000 wildebeest mixed in with hundreds more zebra.

Coqui francolin with 3 chicks, seen nicely close in alongside the parked van.

White backed vultures

sausage trees

giraffe

reached and crossed a small river

6 giraffe (pix in thorns)

Fischer's lovebird

vervet monkeys

12 guineafowl

blacksmith plover

superb starling

40-50 impala

small crocodile (pix), just after recrossing river

12 zebra

500 wildebeest in distance

2 hippos in the river

50 impala, all males

12 Grant's gazelles

50 impala, all female

topi

12 guineas

wattled starling, Hildebrandt's starling, and superb starlings, all on the same branch.

Reached Seronema Wildlife Lodge, and went in for rest stop.

hyrax, on rocks around which the lodge is built

Agama lizard, with pink upper body in the male.

6 buffalo, with close up pix.

50 wildebeest

300 wildebeest

200 wildebeest

6 warthogs

50 wildebeest

another 50 wildebeest

1,000 wildebeest, more or less near the Research station.

5,000 wildebeest, on all sides. We drove through them for 1-2 miles. Peter had heard that there were large numbers in this area and was looking for them; he had been asking various drivers he passed.

8 giraffe

white-crowned shrike.

8-10 hippos.  
 crocodile with jaws open (pix)  
 hyena lying in waterhole, roadside (pix at end of film).  
 ostrich  
 whiteheaded buffalo weaver  
 2 lions in tree (pix), 2 females  
 300 zebras  
 another 300 zebras  
 50 wildebeest  
 12 impala.

We returned to Sopa lodge for lunch.  
 Afternoon game drive, starting 3.30 p.m.  
 bare-faced go-away bird  
 6 Jackson's hornbills (according to Peter, though the guide doesn't list this one).  
 4-5 whiteheaded buffalo weavers  
 12 helmeted guinea fowl  
 50 zebra  
 4 wildebeest  
 50 zebras in distance  
 Nubian vulture, 2 in tree (pix)  
 100 zebra, roadside  
 another 100 zebra, roadside  
 500 zebra, with 150 wildebeest  
 Then reached another group of 5,000 wildebeest, with perhaps 2,000 zebra in among them.

Then we found leopard, stalking. We watched the leopard hunt for an hour or more, one of the high lights of the whole trip. It was making its way down a sort of drainage course with higher vegetation in which it could hide, and this chanced to run alongside the road, so the vehicle could move along bit by bit and follow it, coming now and again in and out of the grass. This was a big male.

Many leopard pix, including wildebeest and zebra, and with leopard's head in the foreground. He was looking for a small zebra or wildebeest. But he never got one, so far as we saw.

secretary bird  
 male lion, rather well hidden in grass, though near road. We almost didn't see him.  
 10 ostrich, running  
 It is beginning to get dark, toward sunset.  
 8 elephants  
 10 helmeted guinea fowl  
 30 helmeted guinea fowl  
 The sunset was a big red ball in the sky.

Sunday, July 2. Sunny, pleasantly cool. We left for a game drive en route out of the park, and thence to Olduvai Gorge and Ngorongoro Crater.

Magpie shrike, 5-6 of them.  
 5-6 giraffe  
 12 zebras

impala  
 giraffe and baby  
 zebras  
 crowned crane  
 yellow throated sand grouse, 3 seen nicely roadside  
 Passed through treeless grasslands.  
 White bellied bustard  
 hartebeest

Went to the Simba kopjes. Simba means lion; lions frequent the area, liking the lookouts provided by the kopjes.

ostrich (pix)

8 lions, 2 male adults (pix), lying in sun. I spotted these first!  
 100 Thomson's gazelles  
 Grant's gazelle with quite small fawn.  
 300 Thomson's and Grant's mixed in.

100 Thomson's  
 300 Thomson's  
 50 zebra  
 Kori bustard, close up. This is a big bird.  
 topi  
 kestrel, species?  
 white bellied bustard  
 Agama lizards on the kopjes  
 spotted hyena. Striped hyena are here, but seldom seen in the daytime.  
 50 Thomson's gazelles

We reached a waterhole area.  
 4 warthogs, at waterhole  
 hyena  
 2 hyena's around at the other side of the waterhole  
 25 Egyptian geese, about the waterhole

Continuing,  
 400 zebra  
 200 zebra  
 400 zebra  
 200 zebra  
 200 zebra. We drove through zebra in various densities on both sides of the road for a mile and a half. Perhaps 2,000 zebra.

3 ostriches  
 scattered Thomson's gazelles

Then passed Naabi Hill gate.  
 rufous-tailed weaver

black chested harrier eagle  
 2 Kori bustards  
 50 Grant's gazelles  
 2 secretary birds  
 Kori bustard  
 common jackal, seen nicely. Much like a coyote.  
 several Kori bustards  
 scattered zebras  
 continuing, on a treeless plain  
 20 eland in distance  
 100 Grant's and Thomson's gazelles  
 5 ostrich  
 25 ostrich, in one group  
 1,000 Thomson's gazelles, drove by them for perhaps 2 miles.  
 300 Thomson's

We passed the Serengeti Park boundary.

Then there was the return trip over the road used to come in, through the dry Masai country, then we turned off on a different road, shortly to reach Olduvai Gorge, a museum and overlook. Olduvai is a corruption of the Masai word for wild sisal, which grows there. Exposed in the gorge are 5 beds, the oldest hominid fossils are at the bottom 1.5 million years old. Archaeologists claim there was once a lake here, beside which the hominids lived, now fossilized. All has since been filled in variously with volcanic ash and sediment.

We lunched here, a picnic lunch, eaten outdoors in overlook area. Pictures of Masai women taken here.

Continuing, back on the main road, we drove to the rim of Ngorongoro Crater. There was a rest stop at an older lodge, the Wildlife Lodge, then on to Ngorongoro Sopa lodge, arriving about 4.30 p.m. The lodge is on the rim of the crater.

There is only one full university in Tanzania, the University of Dar-es-Salam. There is an Agricultural College and a Business College at Moshi, not far from Arusha.

July 3, Monday. Drive down into bottom of the crater. For this we had a new guide for the day, and a more rugged vehicle, a Land Rover. The weather was misty in the morning and clearing as we went down the crater. Ngorongoro comes from the Masai warriors who took this region from the Bantu in about 1800. They used a bell, the sound of which is repeated in Ngorongoro. In the crater there are 15,000 wildebeest, 8,000 zebras, 3,000 buffalo, 100 lions in 5 prides, 400 hyenas in 8 groups, 150 hippos, in 3 pools, 15-20 black rhino, and these have three baby calves of which two are only about three months old. There are no topi, no giraffes, no impalas. Both gazelle's are here. Leopards really live in the rim on the crater, but visit the floor. Cheetah similarly hunt there. Both jackals are here. Poachers are mostly Somalians.

It is prohibited to be in the crater after dark. Rangers can then shoot to kill. This is to prevent poaching.

On the descent, the road proved not really worse than the other roads.

Robin chat  
 stone chat  
 northern double-collared sunbird  
 Hildebrandt's francolin  
 speckled mousebird  
 bronze sunbird  
 golden-winged sunbird  
 purple grenadier ??  
 mouse colored penduline tit  
 umbrella acacia trees (pix). There is a rather good forest at the rim, descending for a ways, then it dries out and there is a grassy bottom to the crater.  
 Sodom Apples (Genus: Solanum). With yellow fruit. removes hair from leather

We reached the crater floor.  
 2 ostrich  
 augur buzzard, nicely seen on ground  
 fiscal shrike  
 wild fig trees, along water courses  
 wing-snapping cisticola  
 Fisher's sparrow lark  
 30 wildebeest in distance  
 50 buffalo in distance  
 anteater chat, black with white wings  
 capped wheatear  
 Senegal plover  
 red-capped lark  
 scattered wildebeest  
 dusky turtle dove  
 zebra  
 12 ostrich  
 One hippo, lying by the river.

Then we watched a cheetah, perhaps 150 yards off, for about ten minutes. It was sitting up and didn't move. Cheetahs are the "greyhounds of the cats."

warthog  
 red-wing bush lark  
 20 Thomson's gazelles  
 Kittlitz's plover  
 2 jackals, black backed  
 black-headed heron  
 sacred ibis  
 cattle egret  
 night heron  
 lion pride (pix)  
 11 cubs, 3 mothers

Lion cubs have a longer period of adolescence than any other cat, two years or more. Cubs do a lot of play, seemingly learning their hunting and defensive skills this way. The pride is made up of

relatives. Mothers keep their cubs secluded from the rest of the pride for six weeks, but after that the whole pride takes turns nursing, babysitting, and playing with them. Prides may be as large as 40, but if so, break up into smaller groups and assemble in large groups only on occasion, perhaps after a large kill. Lions can consume a quarter of their body weight at one time, and then sleep it off. The lionesses spend up to 20 hours a day resting, then hunt dramatically, as we were about to see.

We left the lions a bit to try to catch some buffalo that were moving through.

buffalo (pix)

Then we returned to watch the lions some more, culminating in a lioness killing a zebra. We watched the stalk for an hour or more. The three lionesses went different ways, slowly. The closest one often looked back, then the second one started out in a different direction, then the third. There were two zebras oblivious to it all; the wind was in the lioness's favor. After perhaps forty minutes stalk, the furthest lioness sprang forth, and the zebra ran, but ran in the direction of the closest lioness, the first one that had set out on the stalk. She waited until it came near, then sprang, jumped at its rear, and it went down. When we next saw it, she was hanging on its neck. The drivers of the vans moved around a bit closer as soon as it was clear that the zebra was down. When we got to see it from the new perspective, the zebra was still kicking and one lioness was still gripping its neck. She held it about 10 minutes until it stopped kicking.

The other lioness went off to fetch the cubs, who came another 20 minutes later. They all piled on top of it, but did not immediately start eating it. The cubs stood all round on top of the zebra. We watched another 20 minutes but we never really saw it torn open. All this was about midday. The zebra killed was an adult. Others had said that lions couldn't catch adult zebras and wildebeest because they could outrun them, but the three lionesses working together got this one.

Tigers, in India, not Africa, are longer and heavier than lions, but the lion is the second largest cat. Lions do give a "lazy, lordly" impression most of the time, then erupt in the violence of the hunt. Hyenas are "botched and sulking."

Continuing,  
lone lion well hidden in bushes  
2 hyenas

We reached the salt or soda flats on Lake Magadi. Egyptian geese, a hundred or more.  
glossy ibis, several hundred  
cattle egret, several hundred  
blacksmith plover  
3-banded plover, nearer the water  
lesser flamingos, 1,000 or more of them  
black winged stilt  
cape teal

Then we drove to a picnic area, under open trees. There was a black kite accustomed to taking food from tourists here. Terrible toilets. We ate a picnic lunch.

Continuing, after lunch



**Lion kill of zebra  
July 3, 1995**





We drove back around in the lake area, there are 2,000-3,000 wildebeest in the vicinity of the lake, perhaps 500 zebra.

20 helmeted guinea fowl

1 elephant, seen in bush along the river. There are only old male elephants down on the crater floor.

Hildebrandt's starling, rather like a superb starling, but without the white on the breast.

ring-necked dove

another elephant

30 baboons

150 Thomson's gazelles, some Grant's

About 6 buffalo (pix), close enough in to see them well, and mixed in with some 200 wildebeest. The last pix is of a buffalo with an oxpecker on its nose. I saw buffalo here closer and at more length than anywhere else on the trip.

Egyptian geese

6-8 hippos

300 Thomson's gazelles

2,000 to 3,000 wildebeest, mixed in with 200 - 300 zebras

2 hyenas

Then we came to a rhinoceros with a calf, both lying down in the distance. There were crowned cranes further behind. We watched a while in the hopes she might get up but she never moved. I had asked especially to see a wild rhinoceros as this would make the big five for Jane in the wild (though we had seen several semi-tamed rhinos, once at Sweetwater, once at Masa Mara). Then we went on.

4 hyenas, lying in dirt

1 common jackal

2 common jackals

Then, splendidly, we found another rhino (black rhino) with a baby calf walking behind her. First in the distance, and then we drove up closer and watched 10-15 minutes. She was headed toward a waterhole late in the day, but eating as she went along, the calf variously falling behind and catching up. (pix)

2 black backed jackals.

6 ostrich

Thomson's gazelles, and Grant's scattered on return

We returned to the lodge about dark.

Mercer, Graham, The Beauty of Ngorongoro, Nairobi: Camerapix Publishers International, 1993. ISBN 1 874041 46 6. The crater is more or less circular, about 14 km in diameter. Normally the only elephants there are bulls. Cows and calves stay further up in the forest thickets. Elephants really have no enemies in the wild; cats can't take them. Lake Magadi is alkaline, or "soda" which

is "magadi" in Swahili. Lions succeed in only 15-20% of their hunts.

July 4, Tuesday. Return drive to Arusha, thence to Nairobi. Long day of driving.

Left lodge 7.30 a.m., starting early to allow some time to visit the mission dispensary. Misty and cool. Passed the Conservation Area boundary. Stopped to visit a family in a rural homestead not far outside the conservation area boundary. He is: Juma Tlatlaa, P. O. Box. 272, Karatu, via Arusha, Tanzania, East Africa. Took pictures; send him copies.

Drove through Karatu village. We took pictures of woman at water tap, especially since Jane had worked with UNICEF collecting money to provide better water taps in East African villages.

We visited a dispensary, a sort of mission hospital, a Roman Catholic order. There are 2-3 Europeans here, our host was Swiss, long in Papua New Guinea. Sr. Verona Hutter, Dispensary Rhotia, P. O. Box 66, Karatu via Arusha. They had had a bad siege with malaria in the spring before, two people in a hospital bed. There have been droughts in the area, people are poor, and the government health service (so-called) requires bribes to get attention. People can't afford the quinine to cure it; they come here.

We visited the maternity ward; one young women had just had twins the night before; she looked late teen age, but the sister said these were here seventh and eighth children; she had six more at home! It is hard to visit this place and not weep.

A young girl wanted a ride with us to the main blacktop road, and we took her along. Took her picture at another well.

2 baboons, roadside  
5 baboons

yellow-billed storks, hundreds of them in a roosting tree.

We reached the village of Mto-wa-Mbu again, stopped at the market. There are too many people trying to sell you something.

Augur buzzard  
striped hyena - killed on roadside. This is the nocturnal one you never see.

We stopped at curio shop on edge of Arusha, rather large one. Jane bought T-shirts.

We reached Arusha. We went to the Ranger Safari maintenance yard, and left Peter here for a new driver, Joseph. Changed vans for one that would ride more smoothly. Went to lunch at the Mountain Lodge again, then drove to the border.

Mt. Kilimanjaro was somewhat visible in haze and cloud in the distance.

3 ostrich  
6-8 Thomson's gazelles

The place to see chimps is Gombe Stream Park on Lake Tanganyika, north of Kigoma. This is a

small park. Jane Goodall's research station is there. You have to go the last part by boat. The park fee is \$ 100 for 24 hours.

Salous Game Reserve, southwest of Dar-es-Salaam, is as big as the Serengeti, perhaps the world's largest game reserve, and quite wild. It was once a preserve of big game hunters. There are said to be 100,000 elephants there. Most is trackless wilderness.

Mt. Meru on the return trip was seen better than before, an impressive mountain.

We reached the border and crossed it. Jane bought some beads from the urgent hawkers, making a deal of \$ 10 for four, and had to go into her money belt in the van, with people hanging all around trying to sell something. Rather comical.

We changed vans, and returned to Nairobi. Night at the Norfolk Hotel.

July 5. Wednesday.

In the morning, walked to Text Book Centre again.

Schaller, George B., The Serengeti Lion: A Study of Predator-Prey Relations. Chicago: University of Chicago Press, 1972. Includes chapters on leopard, cheetah, wild dog, and hyena.

Grzimek, Bernard and Michael, Serengeti Shall Not Die. 1960, translated from German. E. P. Dutton. Also a film of the same name, which won an oscar as a documentary. The Grzimeks were a famous German father and son who studied the migration patterns and tried to do a census. The son was killed in a plane crash in a plane being used for census.

Johns, Chris, Valley of Life: Africa's Great Rift. Shrewsbury: Swan Hill Press, 1991. Also and originally Thomasson-Grant in U.S. British ISBN 1 85310 197 4. Mostly splendid pictures. \$ 26 in Nairobi.

Kunkel, Reinhard, Ngorongoro. London: Harvill (Harper Collins), 1992. ISBN 0-00-272188-0. Pounds sterling 40. Mostly gorgeous photos.

van Lawick, Hugo, Savage Paradise: The Predators of Serengeti. London: Collins Harvill, 1977, reprint 1983. ISBN 0 00 216771 9. I bought it, \$ 25 in Nairobi and it cost me that much again to send it by surface mail to the U.S.

Scott, Jonathan, Kingdom of Lions. London: Lyle Cathie, Ltd, 1992. ISBN 1 85626 061 5 on Masa Mara. Good text and pictures. \$ 22 in Nairobi.

Scott, Jonathan, The Leopard's Tale. London: Elm Tree Books, 1985, 1988. ISBN 0-241-11444-6. Text and pictures. \$ 15 in Nairobi.

Smith, Anthony, The Great Rift: Africa's Changing Valley. London: BBC Books, 1988, 1992. ISBN 0 563 36349 5. Done from a TV series. \$ 10 in Nairobi. Looks good.

Palgrave, Keith Coates, Trees of Southern Africa, 2nd revised edition. Cape Town, 1977, 1993. ISBN 1 86825 1713. Major botanical text. 959 pages. \$ 30 in Nairobi.

Middleton, Neil, Phil O'Keefe, and Sam Mayo, Tears of the Crocodile: From Rio to Reality in the Developing World. Nairobi: East African Educational Publishers, 1993. ISBN 9966 46 584 4. 228 pages. This is a critique of those in the developed North who have failed to identify the links between poverty and environmental destruction. The real agenda at Rio was preserving the interests of the developed North both at the expense of the developing South and of the natural world. Middleton is a publisher in Dublin; O'Keefe is in environmental management at the University of Northumbria; Moyo is with the Zimbabwe Institute of Development Studies.

Sanchez, Vincente, and Calestous Juma, eds., Biodiplomacy: Genetic Resources and International Relations. Nairobi: African Center for Technology Studies (ACTS), 1994. ISBN 9966-41-077-5. 16 articles. 371 pages. Sanchez is a Kenyan diplomat; Juma is director of ACTS. \$ 22 from ACTS.

Njoroge, Raphael Gerard, and G. A. Bennaars, Philosophy and Education in Africa: An Introductory Text for Students of Education. Nairobi: Transafrica Press, 1986, 1994. 259 pages. Includes a section of education and ethics. Both authors teach philosophy of education at Kenyatta University, Nairobi.

Walker, Clive, Signs of the Wild: Field Guide to the Spoor and Sign of the Mammals of Southern Africa. Cape Town: Struik Publishers, 1981, 1993. ISBN 0 98977 825 0. \$ 10. But, later, in Kruger and Umfolozi, the guides did not think so much of this. They said it has lots of errors in it; even the lion track is wrong about the ridges in the heel pad; it shows two lobes and there are really three.

Anderson, David S. and David R. Bridge, Focus on Africa: Wildlife, Conservation, and Man. Santa Barbara, CA: Bridgewood Productions, 1994. ISBN 0-9639261-0-1. Mostly pictures.

We took a cab to Jacaranda Hotel. We retrieved the luggage we had stored there. Walked around the shopping centers nearby. I bought an elephant carving. Bought two rolls of Kodak slide film; I had brought ten with me.

Chris Michaelides came by to visit.

Night at the Jacaranda Hotel.

July 6, Thursday. Flight to South Africa.

Left 7.00 a.m. for airport. Hassle there over excess baggage weight, and getting traveler's checks cashed to pay the fee, about \$ 125.

We flew by Mt. Kilimanjaro, seen well, quite visible, though the summit was in and out of clouds.

We arrived in Johannesburg, to find, that evening in the hotel, that my shaver had been stolen from my luggage.

South Africa

July 6. Thursday, continued.

Met at airport by Johan Hattingh, Department of Philosophy, University of Stellenbosch, our host in South Africa.

Spent night at Holiday Inn Garden Court, Pretoria. Dinner at the Inn.

July 7. Friday.

Lecture at UNISA, the university name shortened from UNiversity of South Africa. This is largely an immense correspondence course university, but there is a big building all of offices, rather attractively situated in suburban Pretoria. Host here: Pieter Coetzee (pronounced koot see uh), Philosophy, a member of the International Society for Environmental Ethics, also Jennifer Wilkinson, Philosophy, also a member of ISEE. Gave talk, "Feeding People versus Saving Nature?" Lunch at UNISA.

In the afternoon, met with Karin Ireton, Assistant Director, Industrial Environmental Forum of Southern Africa, P. O. Box 1091, Johannesburg 2000, South Africa. Phone 27-21 800-2687. Fax 27-21 800-4360. They try to serve as a forum to air views. She was in a bush camp earlier with Johan. Her office is in the Eskom Building (the electric power company of South Africa).

Later in afternoon, we visited some shopping centers, and I bought a new shaver.

In the evening, dinner with Johan's sister and her family. He is a consulting geologist, especially when people want to build on this or that piece of ground. Irene and Kallie Strydom, Marais Str. 314,, Brooklyn, Pretoria 001

Saturday, July 8. We drove n.w. through the Transvaal toward Kruger National Park, to spend the night at the Inn at Robbers Pass.

Before leaving, we walked to town briefly, then left about 10:00 a.m.  
Grey lourie (go-away bird) in tree at the filling station.

Drove n.w. to stop for picnic lunch at Dullstrom, small town, in a campground, outside a shelter, overlooking a lake. Somewhat windy.

Continuing, reached "The Inn at Robber's Pass." Delightful place to stay; we were in the renovated stables. There were two stagecoach robberies of gold here once.

swallow-tailed drongo  
kiepersol tree, Cabbage tree, Cussonia paniculata  
blackeyed bulbul  
jackal buzzard, perched in tree

Universities in South Africa:

1. University of Cape Town
2. University of Stellenbosch
3. University of Western Cape

4. University of Port Elizabeth
  5. Rhodes University (at Grahamstown)
  6. University of Fort Hare (in Alica, Ciskei. The Oxford of the Black Universities)
  7. University of Transkei
  8. University of Natal, with two campuses
    - 8a. Durban
    - 8b. Pietermaritzburg
  9. University of Zululand near Empangeni
  10. University of Orange Free State, at Bloemfontein
  11. University of Bophuthatswana
  12. University of Witwatersrand. Wits
  13. Rand Africans at Johannesburg
  14. University of Pretoria
  15. UNISA
  16. University of the North at Pietersburg, with satellite campuses here and there
  17. University of Venda
  18. University of Medunsa. A correspondence university for black medical students.
- This is too many universities for the country.

long crested eagle

The innkeeper says that the wildlife to be expected around the inn and in the immediate area are: bushbuck, duiker, bushpig, oribi (small antelope like a duiker).

July 9. Sunday. We drove through the high Transvaal, including Blyde River Canyon.

Stopped at overlook at Three Rondvels (pix), three hut-like cylinders of rock, rather scenic. Jane bought beads, made of guava, castor, acorns.

Two antelope of some kind seen far below at the bottom of the canyon.

Lunched at Borke's Luck Potholes, and walked to the potholes.

Redwing starling at God's Window, an overlook.

wild cycad seen (pix). Cycads (in Cycadaceae) are gymnosperms, but very primitive ones, found in fossils millions of years old and once dominated forests in days of the dinosaurs. They and the Ginkgo tree are the only seed plants in which the male gametes (cf. pollen grains) are mobile, like those of ferns, mosses, and algae. They are in pairs, typically, and have a spiral band of cilia (pix in Sinnott, Botany, p. 645), which they swim with. In other seed-bearing plants the pollen grain is immobile, though when it lands on a stigma it does generate a pollen tube through which the fertilizing nucleus passes (Blundell, Wild Flowers of East Africa, p. 18). They have massive, unbranched cylindrical stems, covered with scars of abscised leaves, with the current pinnate leaves at the top, and thus resemble a palm. There are male cones and female cones. The ovules are naked inside the cones. There is a readable section in Ernest M. Gifford and Adriance S. Foster, Morphology and Evolution of Vascular Plants, 3rd ed., Freeman.

2nd night at Inn on Robber's Pass.

July 10. Monday. Drove to Kruger and set up bushcamp.

There was frost on roof of car in the early morning.

black wattle. An exotic tree, imported as a windbreak, etc., and has often become a nuisance, though it is important to blacks for fuel.

cycads, more seen on the roadside

We entered Kruger Park at Kruger gate. Paul Kruger statue (pix).

4 impala

fork-tailed bee-eater

5-6 female impala

2 warthogs

kingfisher, species unidentified

24 impala

6 impala

We lunched at Skukuza. "skukuza" means "the one who changes things" or "one who sweeps clean" and was the nickname of the first park warden, Colonel James Stevenson-Hamilton.

Clarke, James, Back to Earth: South Africa's Environmental Challenges. Halfway House: Southern Book Publishers (P. O. Box 3103), 1991. ISBN 1 86812 368 5. 332 pages, cloth. Clarke is a journalist in Sandton, Johannesburg.

Paynter, David and Wolf Nussey, Kruger: Portrait of a National Park. Halfway House: Southern Book Publishers, 2nd ed., 1992. Originally published by Macmillan, South Africa, 1986. ISBN 1 86812 399 5. \$ 25. Halfway House is called Midrand now, halfway between Pretoria and Johannesburg.

We met Ian Milne, an older guide, who was once to have been our bush camp leader. He later attended my Saturday seminar. Met Jan Erasmus (Wolhuter Trail, Private Bag X402, Skukuza 1350, South Africa) and Zettie De Beer (Environmental Education, P. O. Box 50, Skukuza 1350, South Africa), who were our guides for the bush camp.

Bushcamp people from Stellenbosch:

Ian F. Voges (pronounced voo hus), M. A., and now Ph.D. student in philosophy, who had visited us in the U.S.

Friedl Marincowitz (muh rin ko vich), his girl friend, M. A. student in philosophy, Wilhelm Verwoerd, faculty member at Stellenbosch in philosophy. His grandfather was H. F. Verwoerd, the architect of apartheid. His wife is a member of ANC, and a member of Parliament. Both in early thirties.

Marianne Kloppers, secretary in the geography department.

Elbie Vorster, works in food service and nutrition at the university.

She is a linguist and librarian. They arrived in a van, or minibus, what they called a "combi." We could not take the sedan in, but took the combi, and put our gear in the back of a park service pickup truck, which they call a "bakkie."

We drove to Sand River Bush Camp, and set up camp. The area is surrounded by a fence, with supposedly an electric fence on top of that, but the electric fence isn't working. You come in through a big gate, and then close the gate. There was a kitchen area, open sandy area with thatch roof over it, kitchen sinks, and a pantry closet to keep food in, with a freezer. Cooking was in a fire area nearby, with a sort of table out there. Cooking was in big pots that you set on iron tripods. They mostly cooked the evening meal after dark, using kerosene lamps, candles, and flashlights for light.

We slept on the ground, though they provided a very decent mattress for us. No tent, but we pitched a mosquito net over us. We had to put anything the monkeys might disturb into a big blue plastic box and wire it shut. There were flush toilets in a bamboo building, also showers here, which drained out of big cans on the roof. Whatever you put in ran out, cold or hot; there was a stove to heat water in, but nobody used it. People mostly took showers midday, when the cool water was bearable.

It got dark early (by 6.00 p.m.).

There was a large-spotted genet, running around the cooking area that night.

After supper, there was some hoofed animal running with heavy breathing and panting running in the dark.

You had to keep a fire going all night and people took turns doing watch. We were given watch 4.30 a.m. till daylight (6.30 a.m.). Had to build up the fire and keep the coffee hot. There was good firewood, very heavy, called leadwood (Combretum imberbe), which burns better than oak. Also there was another one called red bushwillow. But you don't burn tambuti (Spirostachys africana) to cook with, because the smoke gets in the food and causes diarrhea. It is a good firewood otherwise, however, and we burned it regularly at night later in the Umfolozi.

The baboons in the trees were quite noisy, grunting and growling, fussing with each other, so much that they kept you wake. Lots of other noises, which, as it turned out were lions, hyena, and leopard. This was the noisiest of the nights we were there. Jane had many misgivings.

Daylight. Coffee and rusks (which are a sweet dried sort of bread that you dip in the coffee. Rusk - originally a hard ship's bread.

We took off at about 6.30 in the back of the pickup truck (bakkie).

The country is veld, also spelled veldt. Veld = Afrikaans, field. Level grassland with scattered shrubs or trees, with enough of these it is bushveld. Sourveld is inferior grazing land, cattle cannot eat it much when it is dry. Sweetveld is better grazing land, cattle can eat it dry.

Impala.

6 buffalo, seen nicely at the roadside  
elephant tracks.

We took off on foot, on what proved to be rather too long a walk. I had failed to get a pencil and paper at hand and did not make good notes on what we saw on this hike.

The guides go first, Jan up front and Zettie after him; he called her his "second gun" and that became something of a joke on the camp before the week was over. Their guns are a .458 Brno (made in Czechoslovakia), a bolt action with 5 shots in it. They load and unload them each time we get in and out of the bakkie. Before you are certified as a guide, you have to shoot an elephant. When they are culling them, they take a helicopter and drive one toward you, and you have to shoot it.

Toward the farthest point in, we saw a white rhino, one seen nicely and another seen by others. We tried to get ahead to get a better view of it, but failed. It got wind of us.

We had snacks, or breakfast, in the bush.

dwarf mongoose, on rocks  
African hawk eagle.  
People were by now tiring from the rather long walk.

Saw a giraffe, in a field, not long before reaching the truck. Watched it some time.

Several hundred impala running some 50 yards off; nice running and jumping.

We returned to the truck, late and hungry, perhaps 12.30 or 1.00. We were expecting to be back by 10.00.

En route back:  
giraffe  
several hundred impala, seen roadside  
return to camp.

Cooked bacon and eggs. I had cooking duty.

Afternoon: rest, then off for "sundowners". We rode some distance in the bakkie.  
impala  
6-8 kudu - the best view I have seen, to this point.  
giraffe  
black-backed jackal  
one "blue" wildebeest  
sundowners in open field at a watering point, with windmill water pump, though it didn't seem to be working.  
lion tracks here  
two owls on the way back silhouetted in the tree at dusk/dark.

Went to bed. There were lions roaring in the night; others saw hyenas just outside the fence. Jane and I were supposed to have night watch but they didn't call us.

July 12. Wednesday  
We were waked up by the guinea fowl calling, also there were lions roaring in early dawn.

After rusks and coffee, off again in the bakkie:  
long-tailed shrike

jackal  
 scat from wildebeest  
 scat from zebra  
 3 ostrich  
 rhino tracks  
 rhino midden - territorial dung pile, a big pile of it; some of it fresh.

2 white rhinos seen in the distance. We tracked around to see them closer up and this time succeeded. Steenbok, seen well. We crossed a ravine and climbed a rocky hillside to see the rhinos better. Watched them well for perhaps a minute or two, then someone stood up and spooked them off.

Black rhino calves trot behind; white rhino calves are pushed ahead. Black rhino are more aggressive. But sometimes the white rhino calf is out front, and sees you and is curious and comes on, with mother behind.

Rest/breakfast stop on top.

Typically there are ten wet years and ten dry years here. Zebras do well in dry years. Look at the animal census graphs in the "Make the Most of Kruger Book." They show sharp declines in the 1982/83 drought and the 1991/92 drought, though there is no ten wet/ten dry years cycle evident here. Animal populations of grazers/browsers are related mostly to the availability of food, and therefore to rainfall. Carnivore populations are difficult to estimate, but seem mostly to track the availability of food in turn, and therefore also track, via the ungulates, the rainfall.

Fires. The veld often burned every 2-3 years, with natural fires, but often also with fires set by natives.

3-4 wildebeest  
 impala lily - in the rocks.

Kruger is a summer rain area with dry winters. It is winter here now, actually just a cool season. The Cape Province is a winter rain area with dry summers.

Return to camp for lunch. I had cooking duty again. Took a lot of time chasing monkeys away from the food for lunch.

Video in early afternoon, a copy of a video that the Park Service has decided not to release -- a doubtful narrative that left people confused about the problems.

Off to sundowners

2 nyala seen from the truck. Dark, but rather like kudu.  
 Sundowners, first at a large sycamore tree that people took a notion to climb. There were hippos in the river, and we went down near the river but had to back off. The hippo was grunting and coming our way. We retreated some to an area beneath the sycamore tree. Hippos kill more people than any other African animal, mostly because people underrate them.

Nice fish eagle in the sky.

We got back in the bakkie to go to another place up the river a bit, and walked down to the river.

But it was getting dark and we didn't stay long.

Returning in the bakkie:

water dikkop, flew up from the highway

Meller's mongoose. Black, bushy tail. Nocturnal. Ran along the road on the way back.

To bed. We kept watch 11.30 p.m. to 1.30 a.m. The large spotted genet was prowling around and we watched it with the flashlight, seen quite well.

Albizia (al bizz ee uh) is the tree, false acacia, rather like an acacia but has no thorns.

July 13, Thursday.

Off in the bakkie at 6.30. We returned to the area where we had had sundowners the first evening, with the windmill and watering trough.

White rhino midden

sausage tree

impala midden

lappet faced vulture, three in a tree

black-backed jackal

30 impala

strangler fig on a leadwood tree

elephant wallow

Buffalo thorn - Ziziphus, with one straight thorn and one recurved thorn. The Zulus plant them on graves and think that they can tell how the deceased fare by how the Buffalo thorns flourish or not.  
serrated hinged terrapin

Return to the bakkie

brown headed parrot, seen back at the bakkie

seen from the bakkie on the way back to camp:

ostrich

100 impala

4 warthogs

1 wildebeest

lunch and midday rest

3.30 p.m. Off for sundowners, on the last night in camp. Jackal.

Then an elephant encounter. Elephant charge. We were riding along a narrow road, fighting bushes coming by the edge of the truck. There was an elephant to one side of the road, but when he saw us he started coming our way, first slowly, and then somewhat faster. He was a male with moderate sized tusks. Jan backed the truck up some distance, and the elephant kept coming faster. He was in must and aggressive, now with his ears held out open at the side.

Jan backed the bakkie eventually into a thorn bush and couldn't go any further. He loaded his gun,



**Elephant charge**  
**July 13, 1995**





awkwardly in the cab, pointed it out at the elephant and hollered, and, only some 20 meters way, turned aside with a "walking tall" posture. We all breathed a sign of relief.

Some joking later as Zettie got out the book to read about elephants.

"in must" - a frenzied condition connected with rut. The root is from a Middle Eastern root meaning "intoxicated," as in grape "must" used in brewing wine. The condition is especially known in camels and elephants. The root is not "musk" as in musk ox, musk rat, or the musk deer, the scent gland with strong odor used in perfumes.

Continuing for sundowners.

100 impala  
5 giraffes  
buffalo in the woods  
4 giraffes  
50 impala  
water buck, seen well  
diker and klipsringer, seen together  
kudu  
baboons with young  
brown snake eagle

Marula tree (Maroela africans). Useful and well known. Fruit is made into preserves. Nut is eaten.

Went to see bushmen's paintings under a rock overhang.

Then to sunset in a rock area with notable impala lily, quite massively woody in the rocks, especially a big one with 12-15 blossoms.

Also kudu lily, also with massive woody base. But this was not in blossom, though the flower buds were evident.

13 giraffes.

On return, in the bakkie, there were lions on the dirt road. Three cubs resting in the road, and 3 females coming down our way on the roadside.

After seeing the lions Wilhelm let out his famous "Yes" roar.

Back in camp, a steak "braai" (their word for cookout).

To bed:

In the night lions were right outside the fence roaring in the night and disturbed those keeping watch, and some sleepers moved in from sleeping close to the fence.

July 14, Friday.

Lions roaring as we got up in the morning.

Packed up, without eating breakfast, and all the while chasing monkeys away from the rusks.

Back to Skukuza, and we parted from the group returning to Stellenbosch. Johan, Jane and I continued, moving to quarters at Huhla (pronounced hush-luh), not far outside of Skukuza. This was once a railroad warden's house, now used by the park service for small group housing. Very satisfactory quarters, and we could cook here.

Returned to Skukuza and took game drive in the afternoon.

5-6 kudu, nice males (pix)

50 impala

5 zebra roadside

baboons

fork-tailed drongo

battaleur. Easily recognized eagle. It gives the impression of no tail. Battaleur is the French word for a tight rope walker, and it rocks its wings side to side, like a tight rope walker.

baboons

kudu.

We drove down to the river area, near the boundary of the park.

3 bull kudu (pix) in the evening sun.

Getting toward evening, we went to the area where we heard there was a wild dog den. We had tried to find it on the way out mid-afternoon to no avail, but now had better instructions. In any case, now there were five or six cars in the area. The den was 1 km east of the intersection with S65 on S1, generally west of Skukuza 20 km or so.

First we saw one wild dog in the bush, watched it 2-3 minutes, then moved the car to see three pups at a den entrance. Then we saw one adult nearby, then two came right out on the road, 10 meters away, and we watched them a bit, though I failed to get a picture. Then we pulled up to see perhaps 6 puppies at the mouth of the den, then other adults wandering in the bush. Perhaps 4-5 adults seen, at least 6 pups seen. The pups are dark.

Only the alpha female has pups. Park naturalists say one female here has had 24 in a litter, and the other females lactate and will nurse them. Not many pups survive. If a lion finds the den, it will clean them all out.

Later, on the trail with Cleve Cheney, others were quite surprised that we had seen wild dogs; they had been coming to the park 30 years and never seen them.

We returned to Skukuza, getting through the gate in time. The gates close at dark and you are fined if you are late. Huhla is outside the gate, but on the other side and we had to go through Skukuza to get there.

June 15, Saturday. Seminar for the Kruger Park staff, "Value in Nature and the Nature of Value."

My guide for the trail is Cleve Cheney. Also met his wife, who has a job in the office in the education unit here.



Also attending the seminar:

Petri Viljoek. He monitors vegetation, and knows Gene Decker.

Carl Lourens, pastor of the Dutch Reformed Church here. There is an Interdenominational Church that meets in the same building at a different time on Sunday.

Johan left Cleve Cheney with three or four of my articles, including the Callicott debate on wilderness, Value in Nature, and Feeding People vs. Saving Nature, also some ISEE material. He gave a summary of human-scale development. I discovered that Philosophy Gone Wild and Environmental Ethics were in the library, already autographed and donated by someone to them. I autographed them again, at their request.

Pretoria Technikon, a school that has two academic years and one year in the field, a technical college, and then gives a "diploma" not a degree. But this is changing and the technikons will be giving a B. Tech degree, perhaps with three years and one year in the field. Technikon South Africa.

Lunch, then afternoon game drive.

monkeys

impala

crocodile (pix)

impala

lilac-breasted roller

greenbacked heron

tawny eagle, seen at length at close range

monkeys

impala, 40-50 of them

baboons, pix with young

7 elephants

giraffes

brown-headed kingfisher

glossy starlings, many at a picnic area, nicely developed, where we stopped for a rest stop.

fork-tailed drongo, all black with forked tail, a perching bird

grey lourie

elephant, seen in distance

hippos, 5 lying out of water with birds on them

hippos, 3 in the water

1 giraffe

martial eagle, nicely seen

buffalo, herd of 150 of them (pix) at some distance away.

At a lake, the Lower Sabie Dam site, as far down as we got. We were headed toward Lower Sabie, but were running out of time, and stayed here rather than going into town.

hammerkop

fish eagle

saddle-billed stork

little egret  
 giant kingfisher  
 pied kingfisher  
 grey heron  
 African jacana  
 darter (anhinga)  
 wooly-necked stork  
 Egyptian goose  
 5 hippos  
 African spoonbill  
 reed cormorant.

Driving back, there was an elephant in the road, again! But this time it backed away without confrontation.

helmeted guinea fowl  
 5-6 buffalo, roadside  
 giraffe, in road  
 2 giraffes

2 dozen guinea fowl, as we neared the Huhla camp.  
 There were hyenas calling in the night, close by.  
 hooo-up, hooo-up call. ("Calls of the Bushveld" tape)

Again, hyenas in the night, further off.

The leopard call is said to be like sawing wood. (It is on the "Calls of the Bushveld" tape, side 2).

July 16, Sunday.

We took off for an all-day game drive, prior to my going out on the trail that evening.

duiker on way out  
 crocodile  
 200 helmeted guineas, all along road

We headed toward Pretoriuskop.

rode up Granokop  
 40-50 impala  
 crowned eagle  
 Natal francolin  
 150 impala  
 long-tailed shrike  
 Swainson's francolin, with red face  
 Crested francolin, striped head. Both kinds were in the same flock.  
 kudu - male and female  
 5 giraffe  
 fork-tailed drongo

We then came upon a bloody spot in the road, with three hyenas about (took various pix), and pulled forward a bit to see three lionesses, one eating at an kill, an impala, in the bush 20 meters away, and growling when the other two came near, and the hyenas waiting still further out, coming

out to the road now and again. The first lioness left, not going far away, and the two other lionesses by turns came in to eat, then the hyenas, and lastly some hyena pups. We watched all this perhaps an hour. Here were the "eternal enemies" all together.

Reached Afsaal, a campground. The meaning is "saddle-off", a resting place originally for draft animals. We ate early lunch here. Squirrels about the campground.

Then we took a dirt road toward Pretoriuskop. Rhino middens in the middle of the road.

wildebeest, 5-6

yellowbilled hornbill, the common one here. Diagnostic yellow bill

little bee-eater

2 elephants (pix)

3 kudu

Reached Pretoriuskop, a nicely developed campsite.

African flame tree, orange-red flowers at top

zebra

2 waterbuck, at Shitlhave Dam, out in the open

sable - nicely seen here for the first time. A dark antelope, black with long horns. "sable" means "black," a term especially used as a heraldic color.

fish eagle - at Verwoerd Dam

red hornbill

greater blue-eared starling

50-75 impala

12-14

5 kudu

water buck - all coming to drink at the upper end of the pond

Continuing,

12 impala

red-breasted korhan

squirrel

At the waterhole on Nwatsuthake:

6 wildebeest

4-5 zebra

2 warthogs, one on its knees grubbing

12 impala

4 giraffe

jackal - running near the giraffes

Reached the tar road, at junction 1 km. from wild dog den.

Drove by the wild dog den

2-3 pups lying in the shade, but no adults were seen this time.

Continued, returning to Skukuza for my trail.

monkeys

impala.

At Skukuza, I separated from Johan and Jane to go on the Metsimetsi Trail, with Cleve Cheney (P. Bag X402, Skukuza 1350, South Africa). He is taking a correspondence wilderness management course from Colorado State University, one which had some articles I wrote in the readings (and one I consulted some with George Wallace and others to set up). The course is being moved to the University of Montana, however.

Mike Landman, whom I had met earlier in 1990 was the director of trails until recently, when he took a job still with the parks board in tourism promotion. Cleve is now the acting director of trails, and he expects to be named the permanent director, though there are many slips nowadays with the new politics. Trails are 8 people, and go out twice a week in most camps. They take 7,000 people a year on trails, 65% of them are repeaters. The men/women ratio is 50-50. 92% of them are South Africans, only 8% are internationals, presumably because there is such a long wait to get on them.

The black guide (2nd gun) is Fernando. He speaks Portuguese, and a little English. Trail participants here go out in a rather fancy bakkie, outfitted with seats in the back and a canvas top. I rode up front with Cleve.

This is called a "trail," and you have to book a year and a half in advance to get one. But it is not a backpacking trail; you go to a camp with a fence around it, stay there; there is a cook and food is provided, as is bedding. You go out each day and hike about, and return.

Other people on the trail:

An Afrikaans family of four: Dennes and Lorraine Rousseau, and their sons Jacques, finishing grade 11 and Rikus, finishing grade 6. From Schoemanville, near Pretoria.

Philip R. Sagar and wife, Diz. Financial Director, Streetbeat Shoes, 17 Doris Street, Berea 2198. P. O. Box 603, Northlands, 2116. Other addresses, on the photos he sent: Box 354, Bruma 2026. Inside address: 31 Turnstone Street, Dewetshof, Tvl. 2198. Phone home: 011 622-7271; work: 011 484-3618. Fax 011 484-1191. They have a son in the U.S., in Florida in school and will come to the U.S. next year.

Richard Tucker, electrical engineer originally, though now he manages various projects. Wife: Mary Tucker, a bookkeeper. From Edenvale, near Johannesburg. Both men were rather good with birds. All four had been on trails before and were well travelled in South Africa.

Notes from Cleve Cheney en route to camp. Buffalo are very overrated; old bulls are more trouble than herds. There are 1400 white rhino in the park, 140 black rhino, which are solitary and far slower breeders. Once Kruger had no rhinos at all, they were all shot out by perhaps 1910.

The baboons here are chacma baboons, very similar to the olive baboons in East Africa.

The duikers here are grey duikers usually, red duiker are in riverine habitat.

There is a large elephant typically coming to drink water near camp, with a broken tusk.

Metsimetsi, the name of the camp, means "water, water."

The term "game" ought not to be used, and they are trying to substitute "wildlife."

Seen from the bakkie en route to camp:

impala  
 vervet monkeys  
 crowned plover  
 4 warthogs  
 giraffe  
 a troop of baboons  
 hyena  
 guineas  
 4 waterbuck  
 Swainson's francolins, 6-8

Getting toward the camp, there were 6-8 elephants, with a matriarch, some distance away, toward the hills.

12 Natal francolin, yellow legs, yellow beak  
 50 impala  
 1 wildebeest  
 3 giraffes

We entered the camp. The electric fence is not hooked up. The head of the park insisted they have one, but they have never hooked it up. Cleve says the fence is more to keep people in than to keep animals out. In the past lions have been inside the fence, also elephants; but they chase them out.

This is the Shishengedzine-Nkuwana wilderness area. Pronounced  
 shish in gherd zhan nuh n'koo wahn nuh

I stayed in the hut with Cleve, a good hut, with a desk at the back of it. The walls were made of bamboo and thatch. The toilet was adjoining, and shower, but one of those that you have to put water in before it runs out. He hooked up a cord to the bakkie battery that ran three small florescent lights; one over each bed, and one in the toilet.

The cook is David, who brings a bucket of hot (or warm) water at the wake up call.

Trail guides burn out after about five years doing trails, not so much tiring from the animals and wild life but from the tourists they have to deal with.

Water dikkop heard in late evening, a thin whistle.

More notes from Cleve Cheney, orienting the group around the campfire:

Animals have three zones:

- (1) A curiosity zone. Here they may come closer to see what you are.
- (2) A threatened zone, where they will run away.
- (3) An inner threatened zone, where they think they cannot run away and will attack.

If you encounter an animal, keep facing it and back off. This works 80% of the time. If this fails,

stand your ground. Be bold and noisy, confront it and move closer. You hope this works.

In 17 years of trails, they have shot 17 animals, but five of these were in the drought year in 1992. The stressed animals from the drought gave more trouble. Most of these were elephants; the least shot were lions.

Cleve doesn't believe in firing warning shots. Elephants will flare their ears and intimidate, but this is best not called a mock charge. His rifle is a .458 Winchester. Guides are issued a rifle and keep that particular one.

Black rhinos will charge once and turn around and charge again.

The lion is not the king of beasts; the elephant is.

Hyenas are dangerous only at night, and only if you are asleep and not moving. They will bite your face. But if you sit up they will run off.

Snakes are no real problem, not even in summer, though you have to be careful at rocky outcrops. The puff adder and the black mamba are the two to watch for. Puff adders are too lazy to get out of the way.

There were lots of stars in the sky; the Milky Way was especially notable. We looked at the southern cross and figured how to find south from it.

Watched a satellite cross the sky.

Elephant call in the night.

July 17, Monday.

We left from camp on trail, early, really before daylight, though there was enough light to see a bit. There is a "hide" (blind) at the edge of camp with a watering hole beyond it; you cross the fence near here on a style. There were lions roaring just after we crossed the fence. Hyena tracks seen; there are two lobes in the back pad. Leopards have three lobes in the back.

Elephants push over acacias to get food, and this is considered by many to be destructive. But often the acacia is not killed; the bending over turns the acacia into a kind of coppice. It resprouts and the lower leaves are available for other kinds of wildlife. Also grasses sprout beneath it, protected by the coppice over top.

We saw a spotted hyena a little ways off, and walked closer toward it. Watched it a while. Cleve said this is not dangerous at all; the hyena will run off, as it did. A second hyena also seen, at more distance.

long-tailed shrike

buffalo weaver

water buck, the "target" seen nicely

50-60 impala, running, with a few wildebeest

lilac breasted roller, doing its flight roll

another 50-60 impala  
 lion tracks seen, with three ridges  
 reached a water pool, in a dried river  
 African spoonbill  
 goliath heron  
 3-banded sand grouse  
 blacksmith plover, with its "tik, tik" call  
 Egyptian goose

Continuing, leaving the water area  
 3 wildebeest  
 3 water bucks, again nicely seen, with targets  
 2 water buck  
 elephant tracks  
 rhino tracks  
 civet tracks, small and cat like

We crossed a rather dry river area again, with crocodile tail-dragging marks in the sand.

open-billed stork, seen in flight. When its bill is closed, there is still an opening in it through which light passes. Seen in flight.

Climbed a hill, and had field breakfast on top.

30 impala in the distance  
 6 water buck  
 elephant seen on hill top, toward the skyline, in the far distance  
 baboon skull  
 gray tree moth (Ceratophagus, which means "horn eater") lays its eggs in the horns on dead animal skulls, and the larvae eat their way in, projecting a long feces tube out below, through which they subsequently exist. Almost all the horns found on skulls have this moth larvae formation in them.

little bee eater

Raisin bush. Grewia. This is used to make bows and arrows. You can weave the fibers into a cord, which Cleve did, and this into a rope. You can make it fine enough to sew with it.

grey heron  
 hammerkop  
 saddle-billed stork

Leopard tracks - three ridges seen in the heel pad  
 3 water buck

buffalo thorn. Ziziphus. The spirit tree. The black people take a branch and pretend the deceased travels with it. When the black dies in the city, they take the spirit back to the country where it is to be buried; they even buy a ticket for it. They maintain that lightning doesn't strike this tree. Some article in a recent issue of the U.S. Field and Stream studied lightning strikes of trees and found that beech trees were never struck.

Red-billed woodhoopoe, with calls like a fussy woman.

2 zebra silhouetted on skyline

gray lourie

3 kudu

3 water buck

2 waterbuck

2 kudu

impala

giraffe in bush

zebra tracks look as though the zebra has horseshoes on it

1 zebra

20 zebra

giraffe

6-8 wildebeest

3 wildebeest in distance

kudu

Dung balls formed from dung beetle.

Return to camp.

Near the eating area, there is a small pool of water, like a bird feeder, and birds come in. During and after lunch:

golden breasted bunting

Natal francolin

black collared barbet, bright red face and throat. There were five drinking from the water all at one time.

blue waxbill. With sky blue face and breast, small, a striking bird.

At the big watering hole, beyond the hide:

baboons

20-30 impala

Afternoon game drive

We drove to the point from which we would walk. En route

12 wildebeest

50 impala

tree squirrel

wart hog

Cleve sees armadillos rarely, only one or two in 18 years. One was killed by a lion, and he once saw one from a helicopter. They are nocturnal and only active in the late night, perhaps from midnight to 4.00 a.m. Nobody sees them.

steenbok

There are no antlers in Africa, i.e. which grow from bone as in deer and elk. All the animals have horns, i.e. which grow from modified skin.

zebra

another zebra

button quail

2 klipspringer, seen nicely on hillside

green pigeons

The scat of black rhino is coarser and has bigger twigs (size of a lead pencil, maybe even to the size of your little finger) cut at 45 degrees angle. Seen in midden.

We reached an upper water hole

hippo and calf; we walked round on the rocks to see her

baboons

vultures drinking on the other side of the pool

pieb wagtails, common in East Africa, but this is their lower limit of distribution

water dikcup

3 water buck

On the trail back to the bakkie:

porcupine quill, quite sizeable

3 water buck

5-6 kudu

There are no Thomson's gazelles, no Grant's gazelles in Kruger.

zebra

On the drive back to camp, in the dark:

nightjars in the road and flying up, we saw 12-15 of them.

scrub hare. Seen 12-15 times running.

July 18, Tuesday.

We got into the bakkie and drove a distance for the morning walk. In the first few minutes of the walk, there were jackals calling.

giant eagle owl, flew from perch.

The sound of wildebeest is a grunt that sounds something like "knoo" and hence the other name "gnu".

10 wildebeest alarmed and running. Nice scene.

lilac breasted roller, rolling flight

parrots spp.

communal spiders, make a web something like a tentworm caterpillar.

zebra, seen in close

giraffe

20 zebra, close in

We found fresh white rhino track and shortly they decided to see if they could track it, so we reversed our directions.

civet midden. With lots of milliped skeleton fragments. Civets can eat them even though they contain strychnine.

Eventually, we gave up on the rhino tracking and had a breakfast stop. Just as we were leaving,

we found a rhino horn (pix), which Cleve said would be worth 5,000 rand (about \$ 1,200) in the market. A good one taken from the live animal is worth 20,000 rand. We tossed it away to let it recycle!

white-backed vulture  
long-tailed shrike

Vultures here do not really circle over a carcass. They come down quickly, even when whatever killed it is still eating it, and wait in a tree around it. They roost in dead trees, but if you see them sitting in a leafy tree, look for a carcass.

Found the skin of an impala left in a tree, where a leopard had carried an impala up a tree (pix).

martial eagle  
porcupine quill  
dung beetle balls  
more porcupine quills  
50 impala

Returned to the truck. The youngest of the boys was pretty fagged out.  
From the bakkie, on the way back to camp:

4 kudu  
12 zebra  
20 wildebeest

mopane (pronounced mo pahn nee). A tree that only occurs north of the Oliphants River.

lunch. At the water pool for birds, during lunch:

crested barbet  
crested francolin  
red billed woodhoopoe  
golden-breasted bunting  
5-6 wart hogs, near the water hole  
wildebeest, impala, near water hole

Afternoon game walk:

from the bakkie, en route:

3 giraffe; the male giraffe has a bald plate on top of the horns  
5 giraffes  
12 helmeted guineafowl

on foot:

water buck  
20 impala

walked down a watercourse, mostly dry, until we came to a larger pool and waited there.

in the pool, 5 hippos, often yawning (pix)

Shortly, two elephants came to the pool, not that far away. They were taking up water with their trunks and spraying it on themselves. (pix)

3 crocodiles on another edge of the pool





baboons started to come in, then drew back.

jacana

hammerkop

One of the elephants gave out a loud trumpet call. Impressive. This is a nice finish to the last night out on the trail.

Returning from the water hole

5-6 wildebeest

20 impala

Back at the bakkie, about dark. On the ride back:

others saw a genet, I did not.

30 impala

another 30 impala

6 wildebeest

6-8 scrub hare, roadside

There was some smell of fire in the air, and we drove up to a radio tower to overlook possible fires in Mozambique, only a few km. to the east. It became rather windy.

Steak cookout (braai) for supper, but it was rather windy, and we ate in the semi-shelter.

July 19, Wednesday.

We packed up for the drive back to Skukuza, a big breakfast. We separated from Cleve Cheney, who had another meeting to go to, and had a different driver back to Skukuza.

30 impala

another 30 impala

wildebeest

hyena, running along the road

6 wildebeest

giraffe

We passed several groups of two patrols on bikes, with guns.

6 wildebeest

20 impala

8 impala

6 hippos, in water at dam

12 impala

Then 6 sable bulls, first in the brush and then walked across the road. Nicest view of them you could ask for and only the second time I have seen sable antelope.

30 impala

12 impala

baboons

green pigeons

10 monkeys

6 impala

giant kingfisher  
 darter (anhinga)  
 6 impala  
 2 warthogs

Reached Skukuza and rejoined Jane and Johan. End of the trail camp.

Left Skukuza, about 9.30, making for Johannesburg and a flight to Durban. Changed clothes and repacked as best I could.

There was an impala left hanging in a tree by a leopard about half a kilometer inside the Kruger Gate. Others had seen the leopard eating it earlier in the day, and some were waiting for it to reappear. We saw only the dead impala. Jane and Johan had encountered a big traffic jam here earlier on the way in and did not know what was going on.

We drove to Johannesburg, with not a great deal of time to spare.  
 Flew to Durban.

We got a car and drove outside of town 30-40 km to Botha's Hill, and the Rob Roy Hotel, near Kearsy College (a boarding high school), which was the site of the Environmental Education Association of South Africa (EEASA).

July 20. Thursday. Spoke at Environmental Education Association of South Africa.  
 met:

Claire Holland, The Wildlife Society, Ungeni Valley Project  
 Jo Ferreira, from Australia, visiting at Rhodes University  
 Robert Donnoghue, Natal Parks Board  
 and others

Afternoon: toured the Valley Trust, founded by Halley Stott, a physician, for better nutrition with indigenous agriculture. We toured an experimental garden, led by Alastair Chadwick.

Norfolk Island Pine, Araucaria heterophylla, a gymnosperm but not a pine, strikingly layered. There was also one in the Divinity School yard at Stellenbosch, said to be the tallest tree in town. This is named from its origin on Norfolk Island, halfway between Australia and New Zealand (site of the Pitcairn Islander's second home).

Had dinner that evening with wilderness action group:

Dr. Nolly Zoloumas (zuh low mas), dentist, and member of Wilderness Action Group, member of ISEE, 208 Musgrave Park, 18 Musgrave Road, Durban 4001, South Africa. Phone 27-31-221377. Lived in Zambia.

William R. Bainbridge. Bill. long with Natal Parks Board, lived in Zambia, now a consultant. Bainbridge Resource Management, 314 Alexander Road, Pietermaritzburg 3201, South Africa. Phone 27-331-69133. He subsequently came to the wilderness workshop at Stellenbosch.

Roland C. Goetz, Msinsi Holdings, P. O. Box 53301, Yellowwood Park 4011, South Africa. He was director of Wilderness Leadership School formerly in Natal, when I was here in 1990, also was in Jackson, Wyoming at a conference I attended on economic values of wilderness. He now manages

a trust.

Nolting, Mark O., Africa's Wildlife Countries. Guidebook distributed by Russel Friedman books.

July 21, Friday.

At breakfast, I met Dr. Baldur H. Koch, Department of Agriculture, Private Bag X120, Pretoria, South Africa. Interested in agricultural ethics.

Picked up in combi by Wilderness Leadership School:

Paul Cryer - he was the one bitten by a snake when Vance Martin's son was here.

Bruce Dell - older and longtime trails leader. He later came to Stellenbosch to the wilderness workshop.

Mike Weerts - officially the trails leader on this trip.

Vincent Ncobo, a Zulu with the kwaZulu Parks Board, but placed with Wilderness Leadership School to get some trails going with some political figures.

We drove to Eschowe, to leave Jane with Wayne Elliot and his seven dogs and two cats! please, 8 dogs, 3 cats

Then we drove on to Umfolozi Park. The combined park is with Hluhluwe (pronounced almost flu ee). Once there was a corridor between them but now that is gone.

We then left the van and packed out. I used their backpack and left mine in the van. Not a bad load at all. In this group there is only one gun up front.

seen on the trail:

baboons

impala

7 rhinos, at some distance, though clearly visible.

white-backed vulture

impala

3 waterbuck

wooly-necked stork

crocodile

We spent the first night at a throwdown camp in a sandy area. This was my first night in the bush with no fence around me. The guides look around a bit and try to find an area that has no animal tracks in it, where the animals are not coming through. You just put down your sleeping bag on a thin mat, and that's it. They get several pots of sand and pile it up to make a raised flat area for the fire. The cooking always starts out with browning some onions in a pot, and adding various ingredients subsequently, a sort of stew that is then poured over rice or some mealy stuff. I had to do the night watch from 1.30 a.m. to 3.00 a.m., with a flashlight that wasn't working well. But I kept the fire going pretty well! All told, a rather quiet night. Wood owl calling in the night.

July 22, Saturday.

Rather leisurely get up and cooking breakfast. Then we packed up and left, with considerable effort at "leaving no trace." This includes mixing the ashes up in the pile of sand and scattering it some

distance away to the four winds. Then you brush around over your tracks and cover the area you slept in.

We more or less wandered around through the morning, then lunched at a large tree at the riverside, then forded the river, really not much of a ford, but you have to take your shoes off to do it. The sky was clear, though a few clouds gathering and a predicted front worried them, and they wanted a protected camp. We climbed up a gentle slope to a flatter area, and camped in a grassy area after some time deciding where the rhino were least often coming through. They pitched one rainfly.

Black rhino browse and have larger twigs, cut at 45 degree angles. White rhino graze more and have less coarse dung.

seen in the day on the trail:

impala

helmetshrike

white backed vulture, flushed from nest

hammerkop nest, with entrance hole

Louis Liebenberg is better on tracks than the Clive Walker book.

scarlet chested sunbird

male nyala

battaleur eagle

water buck

5 kudu

Some minute ticks were a bother, the early moult stages of a larger tick. They call these pepper ticks, and they get in especially around your socks. They are almost too small to see and rather like a chigger bite. They wear sandals and say this prevents their getting hold, though Wayne Elliot says this is not a good idea in the bush, and that you can just leave your socks off inside your boot and it works o.k.

There was a bit of rain during the night, and they scrambled out and pitched the second fly, but it proved hardly necessary.

July 23, Sunday.

Cloudy day, though sometimes cloudy bright. We were off to a leisurely start again and more wandering around, this time up a higher area.

75 buffalo, seen at some distance downriver.

2-3 dozen impala

warthog

5 impala

warthog, up close

We looked around several water holes where they reminisced about some adventures with rhino there in earlier days.

The we left our packs to climb a low summit:  
chinspot battis

2 giraffe - I spotted them some distance below.

12-15 water bucks, as we neared the summit

Reached Matshemhlope, 670 feet, with river below at 200 feet on topo map.

2 buffalo seen near river below.

We returned to our packs and then descended to the river for lunch, on some rocks overlooking the river. There was a lot of baboon scat on the rocks, and now one of the buffalo was not far below us. We ate watching it. The buffalo seemed old and tired. Eventually, it got up and walked down to the river.

green pigeons, close at hand.

fork tailed drongo

crested barbet

5 water bucks

A nyala buck and 10-12 females gradually made their way up the river toward us. The females are very different in color from the darker male.

brown hooded kingfisher

After lunch, we crossed the river and shortly reached a campsite frequently used by Ian Player, when he walks in. Some gear is stored here. We pitched camp. I had night watch 9.00-11.00 p.m. Quiet night.

July 24, Monday.

Bruce Dell baked a beautiful loaf of bread in the morning, in a pan, but this made a late breakfast.

Martial eagles, 2 of them, flew over camp and perched over the river where we could see them.

A rather slow morning. We crossed the river again, then recrossed it back and walked out. The old buffalo we had seen the day before was still around.

When we were almost out, there were three buffalo seen at a little distance.

We returned to the combi (van), and unpacked and repacked.

On the way out in the combi:

wildebeest

Charlton-Perkins, William, Hluhluwe Umfolozi Game Park. Cape Town: Struik, 1995. ISBN 1-86825-745-2.

Mountain, Alan, Paradise under Pressure (St. Lucia, Kosi Bay, Sodwana, Lake Sibaya, Maputaland) Johannesburg: Southern Book Publishing, 1990. ISBN 1 86812 277 8. 133 pages.

We drove back to Wayne Elliot's to recover Jane from the dogs. We got there about 5.00 and took a rather welcome bath.

We were visited that evening by Burchert Roberts, Department of English at University of Zululand, who had read some of my material. Friend of Ian Player. He describes himself as a "primitivist". Interested in African literature.

July 25. Tuesday.

We left Wayne Elliot's to drive to St. Lucia for a flight over Richard's Bay, arranged by Ian Player. Pilot is Ray Rothlissberger, with kwaZulu Dept. of Nature Conservation. The plane is owned by kwaZulu Conservation Trust, and was donated by someone in California. Plane is really mostly made of canvass. Took an impressive flight over the area, threatened to be mined for rutile by Richards Bay Minerals.

We checked into a retreat motel, (Bomba Cabanna) with cooking facilities. A troop of monkeys in the yard was quite playful.

Casuarina, a tree common near the shoreline around St. Lucia, evergreen woody, much-branched, with whorled leaves connate forming a sheath about the twig, the leaf tips appearing as reduced bracts. Has the general appearance of Equisetum-like jointed branches. Introduced from Australia. Is this the tree that in Florida I recall being called Australian pine? Some interpret it as a primitive dicot, but others think it is reduced from higher plants. Phylogenetic position seems to be poorly understood (Lawrence, Taxonomy of Vascular Plants, pp. 442-443).

Afternoon:

We drove north to Cape Vidal, from about 3.00 p.m. to 7.00 p.m. There is a dense coastal forest here. Red duiker, two crossing the road. Nyala jumped out in the road; we had to swerve not to hit it. 15-20 impala. Reached Cape Vidal where there is access to the beach. There was a man here cleaning a good sized barracuda that he had caught, and four or five dozen people fishing on the beach with long poles. Somewhat windy, and beginning to get dark. Jane saw Indian Ocean for the first time and got her feet in it; Johan swam.

Grey headed gull. Lots of them here.

Spotted eagle owl, presumably, seen in the dusk on return.

July 26. Wednesday.

Johan went out for a morning walk and had an encounter with a hippo coming down the path on a shortcut he took.

We drove to Richard's Bay to catch a prop plane commuter down the coast to Durban. Then a jet from Durban to Port Elizabeth, where we left Johan on the plane going on to Cape Town and Stellenbosch.

We were met by Pat Irwin, whom we had previously met at the Environmental Education conference in Durban.

We drove to Grahamstown, with a circuit via the small towns of Alexandria and Kenton-on-Sea, a resort town.

greater kestrel

We stopped in the Thomas Baines Nature Reserve. They have 10 buffalo here, 5 white rhino and one leopard, several kinds of antelope. But the main purpose of the reserve is to save samples of the original vegetation in the area.

Our Grahamstown hosts put us up in a bed and breakfast, an elegant old home, but it was always cold.

We had dinner that evening with Pat Irwin in his home, and others in the education department, especially George and Gwenda Euvrard (who was later to take us to Addo Elephant Park), also Hennie and Caroline van der Meselt.

Pat Irwin, Department of Education, Rhodes University, P. O. Box 94, Grahamstown 6140, South Africa.

July 27. Thursday.

Lecture in the morning

There was a striking monkey puzzle tree in the campus lawn. Monkeys climb out on long limbs to get the fruit and the limbs bend down and the monkeys get puzzled.

Lunch with Geoff G. Antrobus, economics and dean of social science, and another economist and a graduate student.

Lecture in the afternoon

Trip to Thomas Barnes Nature Reserve, with Derek van Eeden, the manager of the reserve. He had heard me speak at Durban.

mountain tortoise (= leopard tortoise)

6-8 red hartebeest

1 wildebeest

We went to see one million dollars worth of cycads that had been essentially stolen, though taken with some kind of forged permit in one of the former homelands, and recaptured and planted here.

We had dinner with Felicity Edwards, systematic theology, and Margaret Donaldson, church history. Edwards did a B.D. at the University of Edinburgh under Tom Torrance (my advisor).

July 28, Friday.

Morning lecture

I had a brief visit to School of Ichthyology, courtesy of Ofer Gon, fisheries biologist who had heard my talks. The School was founded by a fisheries biologist who was influential in the school here. He discovered the coelacanths, and one is prominently displayed in the hall, pickled.

Jane went with Anne Irwin to visit two preprimary schools for blacks - one next to finger section of

the township with an enrollment of 65 children. The other was nearer in town in a former Methodist sanctuary; 105 children enrolled and doing very well in classes conducted in three languages - Afrikaans, English, Xhosa.

Lunch with Brian Peckham, lecturer in law, who was in wheel chair, teaches environmental law. Also Ivan Schaffer, dean of the law school.

Afternoon lecture

Dinner with philosophy department:

Ian MacDonald, wife Gus (Augusta), has a M.A. from Kansas, no Ph.D., chair of the dept.

Marius Vermaak, studied and taught at Stellenbosch, younger.

Frances Williamson, with beard, interested in sociobiology.

Gary ? Newer philosopher, there on contract, only been there a week.

Lucerne, or lucern = alfalfa (Medicago sativa), a legume.

July 29, Saturday.

We went to a beadwork festival at Albany Cultural Museum. African dancers and an African choir.

Then back to the bed and breakfast, and off at 12.00 for Addo Elephant Park.

Reached the park and tried to get lunch there, eventually to wait for a lunch that took too long coming.

Then we drove through the park, but in some haste.

One elephant at waterhole.

Another elephant in distance, later seen close up.

A third elephant on skyline, nice tusks.

red hartebeest, group of 6-8

ostriches - perhaps three dozen seen

12-15 red hartebeest

Then a group of 19 elephants crossing a field, including several quite small ones. Nice scene.

While we were watching this another elephant came up the road from behind us, and kept coming closer. We moved forward, only eventually to stop and have it walk past us in the bush.

Return drive, to leave the park:

12-15 eland in distance

Drive to Port Elizabeth, and flight to Cape Town at 5.55 p.m.

dolosse - a big stone, anchor like fabrication, which they pile up to make breakwaters.

Arriving Cape Town, we were met by Johan Hattingh, and drove to Stellenbosch, and got set up in the apartment.

July 30. Sunday.

Went to Presbyterian/Congregationalist United Church.

July 31. Monday.

11.00 met with divinity faculty, Prof. Pieter Coertzen, dean of theology.  
4.00. first lecture

August 1, Tuesday.  
lecture

August 2. Wednesday  
lecture  
evening: reception at Johan's home

August 3. Thursday  
rainy day, and river walk cancelled.

August 4. Friday  
odds and ends

August 5, Saturday. Drive to False Bay, Harold Porter Nature Reserve (tea and scones there), and Hermanus. Rainy day all day, and cold, but still an interesting trip. Johan came at 8.30. We drove south and through The Strand, resort town on False Bay, the bay east of Cape Town. Continued driving around the coastline to Gordon's Bay and Pringle Bay, then out to see Hangklip and Cape Hangklip. Johan does sea diving from here. Stopped for tea at Harold Porter Nature Reserve, at Betty's Bay. There were baboons on the grounds. This is fynbos area. There are a good many baboons in the area and there are several leopards that prey on them. We went to see a penguin nesting colony, of jackass penguins, from their call like a donkey. A natural enemy is the cape fur seal, in this area. There were also in the nesting area many cormorants: white-breasted and bank cormorants. There started a very heavy rain while we were watching and we hastened back. The penguins normally only nest on islands at sea south of here, but in the 1980's they started nesting here. The area is fenced to keep people out, but you can walk to the edge of it. Also the fence is to keep predators out to which they would not be exposed on islands, such as caracals, mongoose, jackals. Once a leopard got into the nesting area and killed 80 penguins.

Continued to Hermanus, a resort town, walked around harbor briefly. We were on the lookout for whales (southern right whales), which come to this area to calve, but saw none. It is a little early for them. A woman at the Porter Gardens had seen one calving yesterday. It cleared some as we drove back. We stopped and looked at a Protea in bloom, roadside; I brought a bit of flower in to take it apart. It has a sort of a composite-like flower; each individual flower on a long stalk, with thin floret with four anthers. We stopped at a spectacular overlook over False Bay at Sir Lowry's Pass, an overlook that I recall from my 1990 trip here, then with Reinold Rau and his Quagga Project. More rain on the way back and in the evening.

August 7, Sunday. Jane and I drove to Cape of Good Hope. Left with mostly cloudy weather, though some blue patches. But it turned out a quite pretty day, though everywhere mostly cloudy. The clouds were part of the scenery, rather like the Lake District in England.

Took R310 southwest to its intersection with N2, then N2 into Cape Town. Drove by numerous squalid townships for the blacks. On into Cape Town and took M3, which runs in front of the

University of Cape Town. Lovely drive. Lovely city in a lovely setting. The Portuguese were the first to sail around the Cape of Good Hope, looking for a route to India. The Dutch first settled here in 1652. The British came in 1806. We continued, south to Muisenberg, and then drove down the east side of the peninsula, that is, the western side of False Bay. Through Fish Hoek, Simon's Town, and on down into the Cape of Good Hope Nature Reserve. Marvelous scenery down the coast.

We reached the Cape of Good Hope Nature Reserve about 10.30. Bartholomeu Dias with three small ships rounded the cape in 1487 and named it Cabo de Boa Esperanca. Ten years later, in 1497 Vasco da Gama came round the cape and made it all the way to India. This is fynbos, low to waist high brush, pruned down by the wind, often many rocks. There are almost no native trees. It is reminiscent in many respects of the Scottish coastal highlands.

We went first to the Cape of Good Hope, the southernmost point, which is low by the sea. 3-4 ostriches going in. There were impressive breakers coming in; we watched them in awe for a while. Then we drove around to Cape Point, which is high. You park and walk up, 20 minutes climb, to an observation point with an unused tower on it. Lots of people here.

We returned to the car, drove back around to the cape and had lunch, watching the breakers. (various pix)

Returning, a nice group of bontebok, stopped and watched them a while. This antelope is restricted to the Cape area, richly colored, grouped by some in the same species as blesbok. Neither had all that much range; both are much reduced in numbers.

Continuing, drove up the west coast of the peninsula, i.e. the Atlantic Ocean side, with more spectacular driving on a road cut into the coastline, especially the Chapman's Peak stretch. A couple of baboons at one point along the roadside. Clouds continued to enhance the scenery. Returned on M63 by the Kirstenbosch Gardens area, and picked up the M3 used earlier in the day. Back at the flat by about 5.00 p.m. Quite a memorable and scenic day, at the bottom of Africa.

August 7. Monday, lecture at University of Cape Town

Cloudless day. We drove down with Ian Voges; met with Roy Siegfried, Fitzpatrick Institute of Ornithology, University of Cape Town, at 11.30 a.m. Lunch with philosophy dept., and seminar with them and graduate students afterward. Then drove by the waterfront shopping area. Cape Town in all its beauty.

August 8, Tuesday. In the morning, met with Charlie Boucher, Department of Botany, and an ecologist and conservationist here. Toured the herbarium. Their research herbarium is soon to be moved to Kirstenbosch. The biggest herbarium in the country is at Pretoria, the National Botanical Institute, a government agency. Kirstenbosch has now been made part of that also. Checklist of the mosses was done by Bob McGill; I looked at a national flora that listed them.

Arnold, T. H., and B. C. de Wet, eds., Plants of Southern Africa: Names and Distribution. Pretoria: National Botanical Institute, 1993. 825 pages. ISBN 1-874907-03-X. South Africa has the richest temperate flora in the world, approximately 24,500 species (or infrageneric taxa), almost 10% of the world's flowering plants. This list is from the National Herbarium system, a computer-based flora. The first part of the list is bryophytes, some forty pages.

MacGill, R. E. and E. A. Schelpe, "The bryophytes of Southern Africa, an annotated checklist," Memoirs of the Botanical Survey of South Africa, no. 43, 1979.

Cowling, Richard and Dave Richardson, Fynbos: South Africa's Unique Floral Kingdom Vloeberg: Fernwood Press, 1995. 154 pages. ISBN 1 874590 10 5 Fynbos, a vegetation type unique to South Africa, is the smallest floral kingdom in the world, yet for its size it boasts the largest number of plant species. Nowhere else on earth are so many species crammed into such a small area. This is an extremely attractive presentation in text and photography, not only of the flora but of the fauna it supports. Its conservation is of great concern and one of the leading arguments here is that the solutions to these problems lie in the recognition of fynbos as an economic resource. Cowling is an ecologist at the University of Cape Town and a 1994 winner of the Pew Conservation Award. Richardson is a researcher at the Institute for Plant Conservation, University of Cape Town.

Later, I had an interview with geologist on environmental geology.

Lecture at Stellenbosch in the afternoon.

Evening: Dinner with Jerry Eckert.

August 9. Wednesday. Hike in mountains out of Jonkershoek Nature Reserve. "Hoek" means "hook," but here a hollow or valley. The lower parts are plantations, but the upper parts preserved as fynbos. We made a considerable climb (about 3,000 ft) over a rather rocky trail, with lowering clouds above. Then we got into the clouds, eventually made the ridge in deteriorating weather and got sopping wet coming back down. It was rather hard picking your way underfoot with water fogging your glasses, but we made it back. This was a holiday, "Woman's Day," the first such holiday in South Africa. The higher mountains here are over 5,000 feet, which means they are as high as Mt. Rogers in Virginia, or Ben Nevis in Scotland, and as high above their base (sea level) as Long's Peak is above the plains. Others not far away are over 6,000 ft.

Evening: Dinner with Johan's mother and father; He is a retired pastor in the Dutch Reformed Church.

August 10, Thursday.

I had an interview with John Hanks, WWF South Africa (formerly Southern Africa Nature Foundation). He is a friend of Gene Decker's.

Evening: Dinner with Rudi Bigalke, dean, Faculty of Forestry. Forestry here has three departments: 1. Wood Technology. 2. Silviculture. 3. Conservation (not the exact names). He is a friend of Gene Decker's.

Had blesbok for the meat-very tender.

August 11, Friday.

Morning: River tour with Danie R. Schreuder, environmental education and the Department of Education. Visits to various spots on the river reveal a great deal about the character of the society on the river. Whites have a clean river and spend money to keep it clean; rivers that flow through the black settlements are polluted, especially with human wastes, also quite trashy; rivers that flow through some problematic colored settlements are

the trashiest of all.

Afternoon. Wilderness workshop with Ian Player, Bill Bainbridge, Alex Weaver, Bun Booyens, Bruce Dell, Rudi Bigalke, Andrew Muir, and others. About 20 participants in the workshop, by invitation only.

August 12, Saturday.

Tea with Nicholas J. Slabbert, who arranges joint ventures in business, also runs a foundation for Laurens van der Post. He has set up a Center for International Business, University of Stellenbosch. He now lives in Maine. He is interested in the possibility of some endowed chair that would be a joint appointment between some school in the U.S. and the University of Stellenbosch.

Afternoon: we drove out to some farms on the "wine route"; then to Somerset West shopping mall, then to the Strand and its beach on False Bay. Marvelous day.

Evening: a fine choral concert by the University of Stellenbosch choir, and reception with the rector, Andreas van Wyk; his field was law. Vice-rector, Walter Classen was in Hebrew, used John Bright as his text.

August 13, Sunday.

I hiked up Witteberge mountain with Peter Blignaut and his wife, Jill. (Blignaut and Rommelaere, P. O. Box 334, Parow 7500, South Africa. Phone 930-2313/4. Home: 794 4836. He is town planner and land surveyor, finishing a Ph.D. degree in planning at University of Cape Town, Framework for a Socio-Resource Zoning Management Policy for the Conservation and Sustainable Utilisation of the Mountainous Areas of South Africa. University of Cape Town, Department of Environmental and Geographical Science, Ph.D. Dissertation, April 1994. She did an M.A. in environmental management in the same department. He has been long active in the Mountain Club of South Africa, a big mountain hiker. They have climbed Long's Peak in U.S and tried Mt. Rainier, but too much snow. Also they have hiked in the Himalayas.

We drove up DuToitklooppas (Du Toit's Gorge Pass), which is on N1 national highway inland (main highway to Johannesburg). There is now a tunnel beneath the mountain (Huguenot Tunnel), but the pass road is still open and preferred by many. At the pass, we took a narrow paved road though a locked gate, which goes up to a microwave tower, and parked the car on the upper reaches of that.

We hiked into a mountain hut, on a trail, after that the hike was a rock scramble all day. Climbed a grassy knob, then leveled out on top, then dropped some into a wetter area, then climbed to a saddle on the flanks of Witteberge (which means white mountain) and had lunch there. We did not try the summit (1,689 meters, or 5,540 feet), which they said is pretty rough the last part up. We returned by a different route, I had to pick my way down carefully, often rather rough. At one point I saw a snake shortly ahead across my path, which they concluded was a puff adder; it made some spitting or hissing noises. We reached the cabin again, and walked out.

We drove down the pass on the n.w. side to see the impressive n.w. face of Witteberge mountain, which is indeed impressive. Also here you can look up to Du Toit peak (DuToitsberge), the highest in this immediate area (1,997 meters, 6,550 ft. This is considerably higher than anything in the eastern U. S. Returned about dark.

Fynbos:

The main growth forms are:

--restioid. evergreen, somewhat grasslike, solid round stems with joints, suggestive of rush or sedge. From family Restionaceae, genus Restio. Fynbos has 310 species in Restionaceae, and 203 species in Cyperaceae (sedge). We walked through restioid growth all day. Restionaceae is almost confined to the Southern Hemisphere, principally South Africa and Australia. It is closely related to Juncaceae (rushes), but the flowers have a pendulous ovule and are unisexual, mostly dioecious. Superficially, they resemble Cyperaceae and where they are numerous in South Africa and Australia they take the place of grasses in the vegetation. The family probably originated in Australia, at least the most primitive members are there. Flowers in spikelets, the male ones with glume-like segments and three anthers. The female flowers have a superior ovary, 1-3 locules, and ovules that are pendulous from the apex. Juncaceae have perfect flowers, 3 or 6-merous, and ovules ascending or parietal. Perhaps two-thirds of the species worldwide are in the Cape flora.

--proteoid. Like Protea

--ericoid. Like Erica, or heath-like. small leaves, heather like, often purplish or pink flowers, bell shaped.

International biologists visiting the fynbos are often struck with the lack of animals. No large mammals are seen roaming about, few bird calls can be heard, and one does not need insect proof netting to sleep at night. It can seem that this corner of Africa is a botanical wonderland and a zoological desert. But there are many more inconspicuous animal and plant interactions.

Especially common is seed dispersal by ants (myrmecochory), thought to be common where nutrients are low, seeds are expensive to produce and rodents are likely to eat seeds on the ground. Ants carry the seeds underground.

Another factor is fire-stimulated germination. Many of the seeds have to be smoked and/or burned to grow well. Many plants are serotinous, fruiting heads remain on the plant and open up only after fires.

There are few fleshy fruited species.

Many species have hard leaves, sclerophylly. This seem to be the reason why there are not many butterflies.

August 14. Monday.

We drove to Cape Town and rode the cable car up Table Mountain. Reasonably good day, but hazy in the distance. Shopping also. Went to the Rhodes Monument.

August 15. Tuesday.

Full day of meetings, and lecture in the afternoon. Spoke to the debating club at their banquet that evening.

August 16. Wednesday.

Day of meetings and lecture in the afternoon. Interview with Alex Weaver, CSIR (Council on Scientific and Industrial Research), head of their Environmental Services. Interview with Bernard Lategan, Dean of Liberal Arts. Interview with Judge Denis Cowan, much interested in environmental law in South Africa.

Heard lecture by Cyril Ramphosa, on ANC Constitution Commission and a labor mediator. Reunion dinner with the Bush Camp group that night.

August 17. Thursday.

Drove to Cape Town in time to get lunch with Johan's wife, Marion, and to visit University of the Western Cape. Largely a colored institution; she teaches Afrikaans language and literature there. Brief stop at the Cape Flats Nature Reserve.

Caught plane home at 5.00 p.m., flying via Johannesburg, with interesting flight over the Karoo on the way up. Then overnight to London, then day flight over the Atlantic to JFK New York, with a splendid view of Cape Cod flying in, the northern hook seen perfectly. Then to Pittsburgh, then to Denver, a rather roundabout flight and some 37 hours in the system. Great trip.

end of Afruca 1996

Sept. 23-24, 1995. Backpacking trip to Fern Lake with Will Aiken. Left Saturday 8.00 a.m. with threat of snow in the evening and on Sunday. There had been a major snow storm in town a week before, broke all kinds of limbs off trees, left 10,000 people without power half a day. But Friday had been gorgeous. Saturday was a very good day. Left Bear Lake about 10.45 and hiked around. Lunched at about the high spot before the drop into Odessa Lake stops, good view of Notchtop. Nice temperatures. Continued, and reached Odessa. Nice view of a dipper walking out from it. Reached Fern Lake about 3.00 p.m. A young coyote was dragging off somebody else's daypack; we saw it just after somebody else had interrupted this. Pitched camp, and cooked early supper, not knowing what was going to happen. Walked back and tried to make it up to Odessa again, but didn't have enough time before dark.

Started snowing rather soon after we crawled in the sack, perhaps 8.30 and snowed all night, a rather fine flake/pellet mix much of the time. I knocked it off the tent in the night by hitting it from the inside. About 5 inches by morning, but not all that cold, and still snowing. We packed up and went round to the lake, thinking to cook breakfast on the ranger's cabin porch, but there is none. So we found a bit of shelter under trees and cooked breakfast with a nice view of the lake. Hiked out in intermittent snow, with only 1-2 inches underfoot past the Pool. Nice blue grouse, close in, on the way down. We had two cars, took one back to Bear Lake and separated there. I lunched with a nice view of Moraine Park in the snow, half sunshine. Returned to town, snow disappearing in the canyon, and nearly 60 degrees and sunshine in town. Giles drove a motorcycle to Phenix this weekend and had a safe trip.

September 30, Saturday. Hike into Mirror Lake and out, with Will Aiken. We had packed to stay in overnight, but there was 2-3 inches of snow at the trailhead and the weather report was discouraging. So we set out for the day thinking to make only the river and perhaps west into the lower part of the Hague's Creek drainage. Left Jeep about 10.00. But we moved well; weather was broken clouds and rather pretty, so we went for the Lake. Reached the lake about 1.30. Blood in deer tracks in the snow on the way up. Also spooked one nice bull elk and saw him well, though briefly in a small open area. Perhaps 4 inches of snow at the lake, with some open spots on the rocks. Lovely view. Clouds are nice drifting in and out the mountains, mostly cloudy with some bright spots and occasional sun through blue sky.

Lunched at the lake and headed out, with steady hike out, reaching Jeep about 5.30 (and an hour until dark). 12.5 miles, and my feet did better than expected, only slightly sore 2nd toe on right foot. Drove on up the Long Draw road to its end at Poudre Pass, where there is a trailhead in to Lulu City. Also there is a nice new campground for tents above the Long Draw Reservoir, with a nice view over a big meadow. Drove home in the dark and actually hit, slightly, a buck about Poudre Park, though it did not damage the Jeep and presumably not the buck. Jane is in Richmond, keeping Marc Bryant's kids while Ann and Billy are in Europe.

October 14, Saturday. Hike to Chasm Lake with Will Aiken. Left 7.30, not a cloud in the sky all day. No snow at the Long's Peak trailhead, but by the time lodgepole gave way to spruce there was a little snow underfoot, and it was variously blown in, blown out, packed down by previous walkers on up above tree line. Lost the trail a bit coming up on Mills Moraine, though only

momentary. Went in to the Shelter Cabin, snow off and on underfoot but no problem. The last scramble up to the lake from the Shelter Cabin took a bit of care, both going up and coming down, as you were usually on some steep snow or ice with rocks variously showing through. Lunched at the lake, getting out of the wind, which was moderating. Conies heard and seen all day, some close up at lunch. No marmots. Good hike out, about 4.00 p.m. Maybe 75 people on the trail going and coming. A few elk seen on the way in, a few more on the way out. Ten sheep right at the mouth of Big Thompson Canyon, where the siphon is, on the way back, all ewes.

October 21, Saturday. Drive up Trail Ridge Road with Jane. Quite lovely day, blue sky all day long. Trail Ridge Road had been thought shut, but they managed to open it, and it has been open about four days. Leisurely trip up and down, then picnicked at the Lawn Lake dam break flood pile, since the road further in to Endovalley was shut. Came home early to get ready for Shonny's 26th birthday party. Snowstorm coming, and it snowed Sunday, 2 inches in town Sunday night, and snowed the trail shut for the season. This may be the latest I have ever been up it.

October 29, Sunday. Pawnee Buttes with Kevin Cook and Will Aiken. Nice day. We had hiked in between the buttes and two big flights of sandhill cranes flew over, maybe 300-400 birds. We heard them calling first, some distance away, and on when some distance past. Later, at the scarp woodland area, there was another flight, about 400 birds. Marvelous. Kevin did a piece in the Coloradoan about it later that week.

Active in the ponds, including under the skim of ice: Water-boatmen (Family: Corixidae, bugs) and/or Back-swimmers (Family Notonectidae, bugs). the latter swim upside down. See notes in Entomology notes, under Order: Hemiptera, Suborder Heteroptera.

Spooked a merlin from telephone wire perch on the drive back. Tell it from a kestrel by the strongly barred tail, below or above. Kestrel has reddish tail with black band at tip.

November 7-22, 1995. Slovenia, Finland, Washington, Richmond. Conference on Conservation of Nature outside of Protected Areas, University of Ljubljana,

Slovenia only became a nation in 1991, breaking away from Yugoslavia in a so-called Ten Day War. Prior to World War I, it was Austrian.

November 9, Thursday Conference  
November 10, Friday.

November 11, Saturday. Took trip through Slovenian (or Slovene) countryside, first north to the southern Alps, the first half of the morning, then south the rest of the day, through karst topography and to the Adriatic Sea. In the morning early we drove to Bled, via Kranj, with a marvelous church on an island in a scenic lake, also a castle overlooking the lake. We walked up to the castle for half an hour. Very scenic countryside. This is the scenic symbol of the country. Rivers here are tributaries of the Danube; they flow into Hungary and into the Danube, which flows eventually into

the Black Sea. Danube starts in Germany, and is second longest river in Europe (Volga in Russia is longest, flows into Caspian Sea).

Returned to Ljubljana and were joined by others. We drove south to karst topography at Skocjan, n.w. of Postojna. The region is called Karst, and karst topography takes its name from this region. There is one of the heaviest rainfalls in Europe and the limestone (and dolomite) rocks are honeycombed with tunnels and openings dissolved out by ground waters; much of the drainage is underground. Large sinks abound, some of them five or six hundred feet deep. Streamless valleys are common and valleys containing streams often end abruptly where the streams plunge into underground tunnels. Though there is a lot of rain, the water runs underground quickly and the land is left dry and relatively barren, or at least unproductive for agriculture. The collapsing rock leaves some very steep cliff walls. We walked around in wooded areas perhaps an hour and a half, descending to a river where it cuts through a cliff-cave. Mild day and some left-over wildflowers still in bloom. Unusual racks for drying hay are quite tall, high as the roof of a house, and they stack a thin rack of hay to dry quickly in this region of heavy rainfall. Harald Plachter, from Germany, a botanist, was good with the flora. The landscape architects with us knew the topography well. The region is also famous for caves.

Continuing, on to the Adriatic coast, of which Slovenia has only about 40 km. Croatia got most of the coastline. We lunched at Izola, with a big platter of various fishes from the Adriatic. We also visited Piran and Portoroz. Vegetation here is Mediterranean: olive trees, cyprus, cedar. Cyclamen hederifolium, seen in bloom wild in the woods, something like a Dodecatheon, shooting star. Acer campestre, field maple, and Pinus nigra, black pine, are common trees.

November 12, Sunday. On flight out, Sunday, the southern Alps seen nicely from the air. The higher points are covered with snow, but all the lower slopes are quite clear. Flew to Frankfurt, then to Helsinki.

Paul Davies and Bob Gibbons, Field Guide to the Wildflowers of Southern Europe. Ramsbury, Marlborough, UK, Crowood Press, 1994. £11.

Mitchell, Alan and John Wilkinson, Trees of Britain and Northern Europe. London: Collins. Collins Pocket Guide, 1995 and earlier. £10.

November 13-14, Monday, Tuesday. 1995. External International Examiner, the "Opponent," at Ph.D. Thesis Defense, held at University of Helsinki, Finland. Thesis: The Varieties of Intrinsic Value in Nature, Leena Vilkkä.

November 17, 1995. Visiting Distinguished Lecturer, "Ethics Gone Wild," American University, Washington, DC, McDowell Conference on Philosophy and Social Philosophy, Jeffrey Reiman, Coordinator.

December 2-5, Linfield College, McMinnville, Oregon.

Adult bald eagle perched in tree, about four miles before arriving at Denver International Airport,

on the limousine down.

December 3, Sunday. Hike up Cascade Head, with Marv Henberg and Kareen Sturgeon. She is biologist, botanist at Linfield and knew the flora rather well. Bruce McCune, Oregon State University, knows mosses, she says.

I was here with Steve Radosevich, forest science, at Oregon State University, in May 1994, earlier with Dan Bottom in February 1991.

Seen during the day: (most are in Pojar and MacKinnon, Plants of Coastal British Columbia).

Lobaria pulmonaria. Lungwort. A lichen with a three-way synthesis, a fungus, an algae, and a cyanobacteria. Lives in the treetops and is important nitrogen fixer.

Tsuga heterophylla. Western hemlock. The needles are of uneven length (hetero-phylla), rather widely and irregularly spaced. Often forms such a dense canopy that nothing much can grow under it. Most common tree in Alaska.

Picea sitchensis. Sitka spruce. This is the main evergreen in the Cascade Head forest. It is a tree that goes all the way up to Alaska, a major tree there, but here it is only in a narrow band down the coast, typically within four miles of the coast. Very sharp needles. Oregon's inland spruce is Englemann. Not so sharp needles.

Douglas-fir. Pseudotsuga menziesii. Seen at an inland stop, not at Cascade Head.

Deer fern. Blechnum spicant. Dimorphic fronds.

Bigleaf maple trees may put out adventitious roots into the mosses and fungi that cover them and draw nutrients this way.

Usnea lichen

Oxalis, Redwood sorrel (sour grass). Clover-like leaves.

Polypodium glycyrrhiza. Licorice fern. The only epiphytic fern here. Licorice taste to rhizome.

Sambucus racemosa. Red elderberry.

Ranunculus repens. Creeping buttercup. Invasive exotic.

Banana slug. Large slugs here.

Bird's Nest Fungi. Nidula. Order: Nidulariales. Smaller than a dime. Nicely seen. Another genus is Cyathus, nicely pictured in O.K. Miller, also in L. R. Hesler. The "egg" is called a peridiole, and (in Cyathus) is attached to the "nest" by a thin cord, called a funiculus. The nest serves as a splash cup. When the eggs are splashed out, to several feet, the cord catches on a twig, stretches, and the egg hangs there while the walls disintegrate and the spores are released. (description in Alexopolus, pp. 527-531). Nidula, seen here, seems to have no funiculus, but the eggs are sticky and catch on a twig to expose them.

Vaccinium parvifolium. Red huckleberry. With green stems. The dominant Vaccinium in the Oregon Coast Range.

Rubus parviflorus (a misnomer). Thimbleberry. With undivided, though palmate lobed leaf. Has white flower. (same species is in Colorado; Weber now places it in genus Rubacer)

Rubus spectabilis. Salmonberry. Salmon-colored berries. Three-lobed leaf.

Adiantum pedatum. Maidenhair fern.

Claytonia sibirica = Montia sibirica. Siberian Miner's Lettuce. Seen in bloom. (This was prominent underfoot when I was here in May 1994.)

Alnus rubra. Red alder. Outnumbers all other broadleaf trees in western Oregon. When you see a hillside with deciduous trees on it, this is probably it. In the coastal fog belt, it does not require riparian habitat, but covers hillsides. But it becomes rare east of the Cascades. Alder leaves are shed while still green.

December 19, 1995. Tuesday. Old Flowers Road from Stove Prairie, alone. Road is open to public across some 3 miles of private land, essentially a sedan road, to the year round Sky Corral Dude Ranch. Several year round homes in here, and the Stove Prairie Ranch seems to be owned by a religious group. Sunny day. Parked at Sky Corral Ranch and proceeded on foot, walking the road. This is closed in winter, but will be open to 4WD in summer. Steady but gentle climb, with light snow underfoot to the Lewis Ranch area, high open area, with a summer cabin there now, but open to public to pass through.

Descend a bit (this is the upper part of Poverty Gulch), and came round to meet up with where, on July 9, 1988, I had come in from the west side (when camping with Giles at Steve Newlin's Jack's Gulch camp). There were good mountain lion tracks in the snow, broader than long tracks, with rear plantar pad three-lobed. Note the Forest Service Road 236 (on map) further west; this seems to be the only road into the Cache La Poudre Wilderness in this area; it goes down to the S. Fork, and looks like it comes out about at the Jack's Gulch turnoff on Crown Point Road. Try it sometime.

Returned, lunched, and walked round to the Clark Homestead. Ruins and a rough cabin here. Then walked out. Robins, chickadees. One deer spooked in the woods. 52 deer, a fine herd, in the open range of the Stove Prairie Ranch on the way back. Returned down Rist Canyon Road, now paved up much further west than before.

December 24, 1995. Put my old binocular scope on permanent loan with Kevin Cook. Jane had bought for me a better one, a Bausch and Lomb at the CSU surplus property auction, when I was in Slovenia-Norway.

December 31, 1995. Rawhide, Audubon Bird Count. With Kevin Cook. There were perhaps thirty people, surprisingly on a bit of a snowy morning, although there had been no snow in Fort Collins. Massive numbers of mallards flew in in 10-12 flights from one end of the sky to another; the professionals estimated 15,000 mallards. For our portion of the circle, we were joined by Helen Hernandez, Loveland, and did a rectangle, County Road 15 north, then west on 84 to 19, then south on 19 to 80, then east on 80 to the Buckeye site, then south to 78, then east on 78 to 15, and took this back north to complete the rectangle. It seemed unlikely at the start, but we found more

birds than we thought we might

rock dove 3  
 flicker 5  
 horned lark 74  
 northern shrike 1  
 great horned owl 3  
 tree sparrows 110  
 dipper 1  
 mallard 2  
 goldeneye 1  
 song sparrow 1  
 meadowlark 1  
 pheasant 1  
 blue jay 5  
 junco 6  
 brown thrasher 1  
 rough-legged hawk 1  
 raven 1  
 kestrel 1  
 starling 220  
 house sparrow 5

The brown thrasher was the best bird of the day. We had driven in to a house site with a considerable shelterbelt of trees and found it in there, along with the blue jays.

Kevin only saw the first two owls. Later he went under the bridge where 15 crosses Boxelder Creek and one flew out, which I saw well. He says they have lived here a number of years. We got permission to walk around several homestead areas; and sneaked onto a few other places.

Returned to the Rawhide Visitor area. On the lake thousands of geese and mallards. Thousands of scaup. Some mergansers and buffleheads. Two good adult bald eagles on an opposite shore, but nice in the scope. Ron Ryder had found a pair of immature Thayer's gulls, sometimes considered only a subspecies of Herring Gull. The two were feeding on a big dead fish at the edge of the dam, and we could get a good look at them, but, even after being told, I couldn't have identified them from an immature herring gull. This is a west coast gull, usually in coastal Canada. The guide says "casual winter visitor in the interior but identification is extremely difficult"! Home about 2.00, with a snow flurry on the way back.

end 1995

1996

January 14, 1996. Lonetree Mountain, from Kelley Flats, alone. Left trailhead about 8.30. Lovely day, warm, I was soon in shirtsleeves from the climbing. Climb a bit and the terrain flattens out. Trying to find the gentler route around to the east, I missed it twice, turning too early on roads that proved to be deadends. The third right turn is the one you want; don't turn too soon. That meanders up and down a while, crosses a power line with a telephone line, and then climbs back steadily to join the straight, steep one (on which I returned) toward the top. Up top the terrain is undulating but often surprisingly flat. Jumped about 24 elk when I walked into the wooded area in which they were hiding for the day. Nice views of Cassian's finches. Several hair woodpeckers, juncos, robins.

Continued north and reached the area where four roads join, here to discover that one of the roads has been recently bladed and is passable by cars, though it looks like it would be terrible if it rained hard. Turned west. The bladed road generally follows the old 4-wd road (the Wintersteen Park Road), but chews it up. Hopefully it will not be built further than the stretch of private land in here. Discovered a man with a jackhammer (rented jackhammer, pickup had an Alaska tag) working on the road and (as it turned out after lunch) getting ready to do some blasting. He didn't even know how far the road was going; was just hired to remove the rock. Went on, with more peace and quiet. Lunched in an open area below Lonetree Mountain. (I followed an old Mary Hagen writeup, but tossed it as there is more detail here now than in the writeup). A half dozen mountain bikers on the return, one seems to be a property owner in here. She says the bladed road comes out in Glacier View off the Redfeather Road.

Feb. 14-20, 96. Grand Canyon and Petrified Forest. Flew to Phoenix Wednesday, Feb. 14, and waited too long in line to get a Budget Car. Drove to Flagstaff, nice drive up, but arrived in dark.

Thursday, Feb. 15. Marcus Ford, my host at Northern Arizona University, took me out to Walnut Canyon, a national monument, with Indian dwellings in the canyon rocks. Walked down and around about an hour. Spoke at Northern Arizona University that evening.

Friday, Feb. 16. Up early, and drove to Petrified Forest, stopping enroute to see the Meteor Crater. I was at the crater pretty much alone. Meteor thought to have hit about 49,000 years ago. World's first proven and world's largest evident meteor crater, though some other more obscure sites are suspected.

On to Petrified Forest and nice day there, with a few walks. These trees were living in tropical forests here about 225 million years ago; the dominant genus was Araucarioxylon (are-a-carry-ox-a-

lawn). A near relative is Araucaria heterophylla, Norfolk Island pine, seen splendidly last summer in the Divinity School lawn at Stellenbosch, in South Africa, native to Norfolk Island, off the coast of Australia. Another relative is the Monkey Puzzle Tree, Araucaria araucana, seen at Rhodes University, Grahamstown, native to the southern Andes. Family Araucariaceae. Tall, coniferous trees, in which the crown is monopodial, with radial limbs. The Grand Canyon, though it has old rocks, was cut in the last five or six million years, so these trees were living long enough ago for the Grand Canyon to be cut some 45 times.

One famous log, "Old Faithful," on the Giant Logs Trail, is 35 feet long and weighs 44 tons. It is somewhat exposed and was hit by lightning in 1962, which caused portions of the log to break off. The park resource manager then worked hard to repair the log. But today the policy has changed, believing that it is best to let nature take its course..

Drove out through the Painted Desert, which is now incorporated into the Petrified Forest National Park. The famous "Painted Desert feeling" of hunger in the late morning with a too late lunch, originated here.

I was last here in 1961, 35 years ago! May 29, 1961. I paid \$ 6 entry fee, senior discount, for the Meteor Crater. When we were here in 1961, I paid 75 cents, and Jane didn't go in to save money! But I figure my salary now is 14 times what it was in 1961.

Friday evening. Dinner, a Sabbath evening meal, with Marcus and Sandra Ford; she is Jewish.

Saturday, Feb. 17. Up to Grand Canyon, driving around through the East Rim Drive. Stopped at Lipan Point, with a nice view of Hance Rapids at a distance in the river. Western bluebird here.

I found I had a chance for Phantom Ranch, if there were no-shows. They typically book 6-9 months in advance, about 75 persons, and typically have about two no shows.

Flora: nice Ponderosa pine here. Utah juniper (J. osteosperma). cliffrose, Cowania stansburiana

Two bighorn ewes seen from the rim, a hundred yards below Kolb Studio.

Took too long trying out a pot pie in my backpacker stove, with the oven cover.

### Grand Canyon Hike

Sunday, Feb. 18. Waited from 6.00 onward in the dark, and got the first of only two no shows, and checked out of hotel. Then caught shuttle around to Yaki Point, to go down the South Kaibab Trail.

On the trail about 8.00. Steady descent. Nice day, not hot, but comfortable, in short sleeves. Nice lighting. Two bighorn ewes, rather tame, on the trail about two-thirds of the way down. One group of perhaps fifteen pinyon jays, rather noisy, with some calls like a magpie. Passed Natural Arch, seen some distance up off trail.

Reached Panorama Point about 12.00 and ate lunch there, overlooking the two bridges. Left about 1.00 p.m. Redtail hawk. Rock squirrel (Spermophilus variegatus) Descended to River, crossed over the Black Bridge, lingered by the river's edge some. Checking my river pictures later, this is

where we camped in 1967 on the river trip, 29 years ago. I have only pictures of the Black Bridge from that trip; the Silver Bridge may not have then been built. Reached Phantom Ranch perhaps 2.30 p.m. The Black Bridge, or Kaibab bridge is the oldest. The Silver Bridge was really built for the pipeline; mules will not cross it, as they can see the river below through the gridwork floor. Mileage down 6.3 to river. 6.9 to Ranch.

Descent from rim at Kaibab trailhead, Yaki Point, 7260 ft, to river, 2400 ft., is 4,660 ft. Ascent here is discouraged in summer; too steep and hot. About 250 people a year have to be rescued from the canyon. No water on this trail.

There is to be an artificial flood in March, to wash out the accumulated sand from the side canyons. Maybe. But the river as a whole has much less sediment than once; it is stopped in Glen Canyon Dam.

Phantom Ranch was once Rust's Camp, from David Rust, 1902 onward. Teddy Roosevelt stayed here in 1913, and it took the name Roosevelt's Camp. It became Phantom Ranch from 1922 on. There are some Indian ruins near the river, from about 1100 A.D., but afterwards unoccupied. There were for a number of years several stone cabins, now more cabins, for 2-4 people usually, once and still used by the mule trains. Built in 1976, now there are also 4 dormitories, so called, with ten beds, for men or women. There are usually about 75 here, if a couple take a cabin; if the cabins are packed with children or whatever, there can be 90 at maximum. Campground has about 30 sites. About two pack strings of mules come down each day, plus one supply string. There is a telephone, now via microwave, though once a famous telephone line rim to rim, which is now a historic landmark.

Water is taken from Roaring Springs, up the North Rim trail, piped down, through Phantom Ranch and rises by gravity to Indian Springs, from which it is pumped to the South Rim. Also there is an electric line with the pipe, all buried under the trail, more or less.

There really is no winter here, no snow, but snow on the rims shuts them down pretty much for half of December and January. There may be snow for the first mile or two of trail; too icy to get the mules over and not really that pleasant for hikers. But from February on through November it is steadily booked for 6-9 months. The men in the dormitory with me had booked last May for this trip, now February.

This is Lower Sonoran Desert, with the flora of northern Mexico.

Flora: mesquite (*Prosopis glandulosa*)

Catclaw (*Acacia greggii*)

Prickly Pear. Some willows.

Agave

High today 82 degrees, low 50.

Mule deer in Ranch area. One woman saw a ringtail; I did not.

Monday, Feb. 18. Walked out, Bright Angel Trail. Breakfast was at 5.30, and left at 6.15, not moving very fast because it was still too dark to see much but the outline of the white sandy trail. A little more light by the time I went over the Silver Bridge, and soon enough plenty of light to see. Trail goes along the river about a mile or so, then you climb. Relentless climb. But it is a quite good graded trail, never really the virtual stairsteps that the Kaibab trail has coming down. Passed Indian Springs. A few deer here. Two tunnels, or, better, rock cuts, are near the top. Somewhat cloudy, though the trail is in the shadow of the canyon walls surprisingly so that it was really 11.30 before I had my head in any sunshine. There is good water at Indian Springs, and, in summer,

water supplies are put in a couple other spots. Also there are a couple creeks. Got out about 12.10, slightly less than 6 hours out. Mileage out 9.3. Total 18.3 miles. Ascent, 2400 ft., to 6860 ft at Bright Angel Lodge, 4,460 ft., Sore upper legs a bit, and in the last mile got a chafed place on one heel; otherwise o.k.

David Thayer, A Guide to Grand Canyon Geology Along Bright Angel Trail. Grand Canyon Natural History Association, 1986. Read at Phantom Ranch and on sale in the bookstores there.

Stanley S. Beus and Michael Morales, eds., Grand Canyon Geology. Oxford University Press and Museum of Northern Arizona Press, 1990.

### Yellowstone wolves

Feb. 29-Mar. 8, 1996. Yellowstone wolves. Thurs, Feb. 29, left Ft. Collins at 6.30 a.m. driving north. 24 antelope. 12 antelope, before crossing the state line. In Wyoming: antelope: 24, 10, 50, 12. One adult bald eagle at the North Platte River crossing south of Douglas. 17 antelope. 4 mule deer. Antelope continued: 10, 8, 12, 8, 36. One redtail hawk. 12 deer. Night at Billings.

Friday, Mar. 1. Drove from Billings to Gardiner and then to Lamar Valley, Buffalo Ranch facility where the Yellowstone Institute is housed. 11 adult bald eagles, 1 immature on the drive up Yellowstone River from Livingston. 6 deer.

Entered the Park about 10.30 a.m. 24 elk. 6 elk. Lunched at Mammoth Hot Springs. Drove from Mammoth Hot Springs toward Tower-Roosevelt junction. 3 bison. 4 elk. 36 bison. 5 coyotes, coming and going from the remnants of a carcass in an open waterhole, having difficulty getting much out of the water (pix). Heard these coyotes howling. 3 bison. Passed Tower Junction. 150 elk. 12 bison. 17 bison. 8 bison (pix). 25 elk. 10 bison. 12 bison. 9 bison. 19 bison. 7 bison in Lamar Valley (pix). 40 bison. Reached the Lamar Valley Buffalo Ranch, met Pam Goetz, Assistant Director of the Yellowstone Institute, and moved into Cabin 5.

Potluck supper at 6.00 p.m., and opening session Friday night.

The Idaho wolves were a hard release. They were captured in Canada, Alberta and British Columbia, flown to Montana and just turned loose in the Idaho wild areas.

The Yellowstone wolves were a soft release. They were captured in Canada at the same time, and put in acclimation pens in Yellowstone. This was hoped to curb their instinct to wander trying to find their way back home, since the wolves had no idea how far they had been transported from their home territory.

There are now four packs presently free ranging. There were three acclimation pens: one on Rose Creek, which is the creek that flows right by the Ranch, a small creek. This is now called the Rose Creek pack, the pack that we saw, presently nine wolves, of which seven are year old pups. This pack is killing about one elk a day. The mother is 9F, the alpha female; their father was 10M, which is the wolf that was shot near Red Lodge about the time the pups were born. 9F, the alpha female has since paired with 8M from the Crystal Bench Pack. One pup was hit by a UPS truck in January

and killed.

The second pack is Crystal Bench. This is from the Crystal Bench pen which is above Crystal Creek, opposite Slough Creek, the pen of which we could see a bit of chain link fence in the binoculars from the Slough Creek turnout.

This pack was once six wolves, now is down to three. One, 8M, left and is with the Rose Creek pack, see above. One, 2M, left and has paired with 7F from the Rose Creek pack to form the Blacktail pack. One 3M, attacked sheep outside the park and was killed.

The third pack is the Blacktail Pack. This is only two wolves, as noted above 7F from the Rose Creek Pack having paired with 2M from the Crystal Bench Pack.

The fourth pack is the Soda Butte Pack. They were acclimated in a pen at Soda Butte, now removed. This has proved a wide ranging pack and they have really moved out of the park to the north. There is one pup in this pack of which the sex is unknown. One 12M left the pack and traveled south, and was found shot down toward Dubois.

There are 19 free ranging wolves now in the park.

New captures in January brought an additional 17 wolves, now in the acclimation pens, of which there are now four. (1) Rose Creek, above the Lamar Ranch facility. Rose Creek is the one that runs through the ranch; it fans out with several branches as it nears the valley floor. (2) Crystal Bench. (3) Blacktail, a new pen in 1996. (4) Nez Perce, way down toward Old Faithful, a new pen in 1996. These packs have Canadian names, temporarily. These new wolves are under guard around the clock. There have been threats to shoot them.

So there are 36 wolves in the park.

The last two wolf pups in Yellowstone were trapped in 1926. Four were seen passing through in 1934. Yellowstone has been missing wolves for most of this century.

Evening lecture by Mark R. Johnson, D.V.M., the veterinarian in charge of veterinary aspects of the project. Has a keen interest in the ethics of wildlife handling.

Sat., March 2. Up at out at 6.45 to see what we could find. Drove down to Slough Creek turnout, and looked south over the Crystal Bench territory, but nothing. Then we heard them howl, to the north. We walked in the snow about a quarter mile to a knoll, and, with binoculars, saw one at considerable distance; it was going downhill, and soon we saw two more at a carcass. Eventually we found seven here, difficult to make out unless moving, but then we knew where they were and could watch them. When they left the carcass for a time, a couple coyotes came into feed on the carcass, and were promptly chased off by the wolves. Wolves have now killed 10 coyotes in the park, so far as is known.

An adult bald eagle flew in to the carcass, and stayed perched on a tree nearby for quite a while. More briefly, there was a golden eagle there.

A light plane flew over with the radio trackers. They locate the four packs each day that the plane can fly. The signal is just a beep, a different frequency for each wolf, but it is arranged to switch to a different kind of beep if the wolf is dead.

After an hour and a half or so, the wolves moved up the hill, memorably in a line breaking a new

track in the snow.

We left about 11.00 p.m., first driving down to see whether we could see more of these wolves, then driving up past Lamar Valley to Soda Butte to check for the Crystal Bench pack. No luck there. 7 bison. 18 bison.

The Cooke City road follows Soda Butte Creek beyond here, the Lamar Valley goes up another way, with no road.

The radio tracking on the ground is done by Nathan Varley (John Varley's son) and Dan McNulty. Nathan has just finished a M.S. at MSU; Dan finished CU Boulder.

Afternoon. Lecture. Study of track casts. Wolf pups are born in a den and later moved to a rendezvous site, which may be moved around some. But the pups do not stray much from the rendezvous site, to which the parents return carrying food or regurgitating food every day. A rendezvous site is usually recognizable, there are bones all around and lots of scat. By the time the pups leave the rendezvous site to roam freely, their tracks are already bigger than those of a coyote.

Large dog tracks will be as big as those of a wolf, although not many breeds of dog will be.

The front foot print is bigger than the rear. The interdigital pad has three wings on the front foot and these are indistinct on the rear foot.

In a track you must distinguish between the minimum outline, which is the size of the foot, and the deeper exaggeration that results from squishing out further the mud or snow.

There is a ridge of callous on a red fox.

Cats have two lobes on the interdigital pad, and rarely show claws. But the bigger the dog, the more often the claws also don't show.

Snow print wax. A beeswax spray made in Sweden. You have to spray it over a track in snow and it forms enough crust that you can pour plaster of paris into it; it will set in about forty minutes, though do what you can to insulate it while it sets.

Late afternoon. Out in the vans again. 2 coyotes. 50 bison on a ridge. Back to Slough Creek, where we had seen them in the morning. Coyotes. Bear claw marks on an aspen tree. 12 elk.

There were two wolves back on the carcass, which was now more opened up, in the cold at dusk.

Wolves don't have many fleas; fleas are on cavity nesters.

Saturday evening lecture by Doug Smith, who tracks them in the airplane. John Weaver made the studies in the 1970's that recommended that wolves be reintroduced to Yellowstone. In the American public as a whole, about 80% favor the reintroduction. In Montana and Wyoming about 50%.

One of the newly capture wolves bit John Weaver, and took a chunk out of his thumb. According to protocol, it was killed to check for rabies, although Weaver were perfectly willing just to watch it in the pen and to be content with the blood test, which is less than perfect.

Mech thinks that wolves are not subject to inbreeding depression. But there is worry that there will not be enough genetic diversity in the Yellowstone wolves. So an effort is being made to get wolves from different areas in Canada.

Sunday, March 3.

Out at 6.45 a.m. We stopped at Slough Creek. There were no wolves on yesterday's kill. 3 coyotes on yesterday's carcass. Another coyote 50 yards off. Several dozen elk. 65 bison, bedded down.

Another coyote walked by close in while we were out looking around at Slough Creek. We heard the wolves howling again; Nathan Varley and Dan McNulty arrived; radios indicate; the pack is now on the south side of the road. But we couldn't spot them.

We drove up to Soda Butte to see if we could spot that pack. 3 bighorns, 1 nice ram on the skyline above the road. Good coyotes howling. No sign of the Crystal Bench pack.

Returning, at the lower end of Lamar Valley, Candy spotted something coming across the valley; and we couldn't believe our eyes. It was the Rose Creek Pack, perhaps a 100 yards away. Jim said this was the closest to the road he had ever seen them. There was a scramble for cameras inside the van. The wolves turned to retreat down toward the river and we got out and watched. They got more comfortable at more distance from us and spent time around the river, even frolicking and playing some. (This is on videotape; ending just before the scenes of making casts.) Then they went up onto the bench behind the river and walked the flat ridge. There were 8 wolves in a line, a great sight. The ninth kept much further behind.

We walked down to where the wolves had made tracks in the snow and made casts. There was a carcass with antlers and ribs nearby, but seemingly not a recent kill. Coyotes howling.

There is a carcass in the Narrows area between Lamar Valley and the Slough Creek area; up the hill from the road. Coyotes are on it, but no evidence of wolves, and no evidence that the wolves killed it.

Back to the bunkhouse for lunch and afternoon seminar.

Nathan Varley and Dan McNulty brought in the skull and jaw of the elk on which we saw the wolves feeding Saturday morning.

We watched an unpublished videotape by Bob Landis, Yellowstone Wolves, Part 2, 23 mins. 08/05/95. D 81836. Landis Wildlife Films. Shows wolves chasing various elk in a herd of several dozen and picking out one that is limping in the rear legs and taking it.

End of formal seminar.

Back out at dusk with Jim Halfpenny and Bob Barber. Down to Slough Creek area. One grey wolf, then four black ones going over the ridge beyond Crystal Creek.

Monday, March 4. Good snow overnight. Out about 7.30 a.m. 3 coyotes, 3 elk in snow. At Lamar Bridge, we saw, rather dimly in the snowstorm, on the hill south of Crystal Bench, 3 wolves and 6-8 elk.

4 coyotes in snow. 1 immature bald eagle.

8 coyotes in Lamar Valley, moving across the snow, with other coyotes howling from another direction. Nice scene.

Various bison and elk. Nice bull elk in snow.

Drove to Cooke City to get gas and for lunch, in steady snow. Lunch there.

Bighorn at Soda Butte. I took pictures.

We passed the UPS truck with the driver that hit the wolf and killed it in January.

The Churchill, Canada trips are in late October to early November. The Kodiak, Alaska trips are in late summer, August.

Bob Barber is going on a Wrangell Island tour, booked through Overseas Adventure Travel, though he could as well have booked the trip directly. There are two Wrangel(I) Islands; the one he is going to is in Russia, north of the Arctic Circle, usually spelled Wrangel, named for Baron Wrangel who sought it, but never found it, and has not long been opened to tourists. The other one is much different, far down in the Alaska s.e. panhandle almost where it runs out into British Columbia; this is usually spelled Wrangell. There is a town here, Wrangell.

We drove back from Cooke City. 2 coyotes. Back down to Slough Creek.

After some wait, we saw seven wolves coming across the slope beyond Crystal Bench. They disappeared, then, after more wait, came out lower; we drove down the road a bit, and watched all nine wolves cross the edge of the flats (pictures here at the end of the roll of film). Then we followed them, moving further down the road, and, now toward dusk, watched two wolves chase two elk across a small clearing and into some conifers. (This is on videotape.) About two dozen elk came hurriedly out of these conifers onto the flats below, but we do not know how the chase ended.

Back to the bunkhouse, and supper with Jim and Diann there. They returned to Gardiner for the night; Bob Barber and I stayed at Lamar.

Tuesday, March 5. Blowing snow all day. Bob was soon gone, and I followed, but we could see nothing in the snow. About 8.30 Jim arrived, but there was nothing where we saw the wolves last yesterday. Radio indicates the wolves have gone north, with weak signals, pretty far north. The guy here doing photography has a radio, which is not illegal, though the Park discourages it.

We found the tracks where the wolves had crossed the road, made some measurements on them, and tracked them a bit in rather deep snow. One way to see what's in a track in snow is to cut it away on a pedestal, and then gently work away the loose snow that has filled in the track, maybe blowing it away. You can usually tell whether it is hoofs or has four toes or what.

Wolves usually travel single file in deep snow. In the tracks we could often see a body trough, where the body dragged through the snow.

Coyote scats are rarely over 1" in diameter; wolves 1 to 1 ½ inches in diameter.

The trucks came by with mules and with carcasses to feed the wolves in the pens. We went back to Lamar and watched them hook up the sled and go up to feed the new wolves in the Rose Creek pens. The mule sled took about four hours to go in and back. Snowing hard.

Lunch.

We had a scanner for the park service frequencies. I listened while I finished reading L. David Mech's book, The Wolf. The road from Mammoth to Cooke City is temporarily closed; the snow plow is working it under white out conditions.

30,000 people came to Lamar Valley trying to see the wolves last summer. Some wolves were seen for 43 consecutive days.

KOWA is the good spotting scope the Institute has. 27 power.

The best time to see grizzlies is late May, early June in Lamar Valley, better than Hayden Valley, though there are some there too. Try the Wildlife Observation Class, May 28-31, and then stay on for Michael Bartley's class, Backpacking in Grizzly Country, or Grizzly Bear Ecology and Management, June 7-10.

The road was opened again about 5.00 to let Cooke City People pass through.

We went out again and met Jim and Diann watching bison and an elk carcass with five coyotes on it, to the north of the road below Slough Creek. Two of the coyotes had a fight, and various others were driving each other off the carcass. Back to the ranch, and the evening there, with good discussion of wilderness.

Wednesday, March 6. There was a good full moon as I got up. Clear and cold, -1.3° Fahrenheit. Jim and Diann and Bob went separately, and in a few minutes I drove down in the Jeep to the carcass of the night before. Three coyotes on it, but no wolves. No wolf activity.

We drove up to Soda Butte, and, not long after I arrived, I saw the Crystal Bench Pack for a couple minutes, two blacks and one grey. There are only three in this pack. They came out of the woods and across into another patch of woods, and never came out. Jim, Nathan, Dan, were up on the hill and claimed they could barely see where they had laid down, and saw them get up and move around once or twice. Waited till noon, but no movement.

Returned to the ranch and packed up to leave. Back to Soda Butte, but no movement. I climbed the hill, somewhat awkwardly with the spotting scope, but could see nothing. The spotting plane flew over and circled over where we know the three wolves in the pack were.

I left to head out. There were 7 coyotes on the carcass below Slough Creek. Two were in a copulatory tie; I watched them tied for about 20 minutes. Then they broke loose; the male dragged his rear in the snow some after that. He tried to mount the female again, but to no avail.

About 75 bison on the drive out. 50 elk.

A coyote digging in the snow not far from the road.

Another coyote walked right past the Jeep.

Two coyotes came down the road in front of the Jeep, then veered off downhill.

Dinner at Chico's, fancy restaurant and lodge located at a hot springs about halfway between Gardiner and Livingston, though off on the east river road.

Night in Gardiner with Jim and Diann.

March 7, Thursday. Left at 5.15 a.m. for the drive home. Breakfast in Livingston. Road to Livingston clear, in the dark, but the Interstate was one good lane clear of snow, but the passing lane with light snow, and skittish for any passing. Pretty much the same nearly all the way home. Slightly under 700 miles in slightly less than 12 hours.

One dipper seen going in the water and back out, at Soda Butte, just as I was leaving.

Fisher, Hank, Wolf Wars: The Remarkable Inside Story of the Restoration of Wolves to Yellowstone. Helena: MT: Falcon Press, 1995.

McIntyre, Rick, A Society of Wolves: National Parks and the Battle over the Wolf. Stillwater, MN: Voyageur Press, 1993.

The Wolf: A Howling in America's National Parks. Narrated by Robert Redford. Zion Natural History Association. 30 mins. Available: Zion Natural History Association, Zion National Park, Springdale, UT 81767. Also The Yellowstone Association, P. O. Box 17, Yellowstone National Park, WY 82190.

Was That a Wolf? A Video Guide to Wolf Identification. 16 minutes. 1992. Lonewolf Productions. Bruce Weide, Pat Tucker, 833 Harrison, Missoula, MT 59802. 406/363-7291.

Ross, Drew, "Bear Deterrent Sprays," Bears Magazine, Winter 1996, pp. 5-7. 11110 N. 5600 W, Tremonton, UT 84337. 801/257-3634. Also I have a handout from Jim Halfpenny.

Bear Watching Guide, Denali National Park and Preserve, Alaska, Bears Magazine, September 1995.

The Wolf: Real or Imagined? 1992. Lonewolf Productions. 28 minutes. Also produced by Montana Committee for the Humanities and Idaho Humanities Council.

Yellowstone Association. Wilderness Profile. their newsletter. vol. 11, no. 1, Winter 1996. Has a good story on wolf reintroduction.

Beyond Little Red Riding Hood: A Resource Directory for Teaching about Wolves. Timber Wolf Alliance. Sigurd Olson Environmental Institute, Northland College, Ashland, WI 54806. 1994. 715/682-1223.

Yellowstone: Realm of the Coyote. National Geographic Video. ISBN 0 7922 3254 2. 60 minutes. 800/626-2500. Quite good. We watched it. Follows one coyote through a year, when he is chased out of his pack, spends the winter alone, and finds a mate in the spring (no doubt the narrative is pieced together from isolated shots).

end Yellowstone

March 8, 1996. Received invitation to give Gifford Lectures, University of Edinburgh, Scotland. I was working through a pile of mail received while gone and came across a brown envelope from University of Edinburgh, the Principal and Vice-Chancellor's Office. Since I once in a while get solicitations for gifts through this office, I almost tossed it unopened. But then I thought, "That one looks a little different," and opened it to my great surprise. Sutherland's invitation letter is dated 27 February 1996.

### Minnesota Wolves

March 28-April 3, 1996. Ely, Minnesota, and the wolves, via Milwaukee and Marquette University. Thursday, flew to Milwaukee, Friday, spoke at Marquette. Saturday, flew to Duluth and rented car, drove to Ely. Duluth has broken snow cover, but by the time I got to Ely there was solid snow pack, often 3 feet or so. Crossed the Laurentian Divide, which is where water goes three ways, to the north into Hudson's Bay, or into the St. Lawrence, and south into the Mississippi. The Mesabi Range here is the site of the largest iron mines in the world. The Range Cities are the towns in this area. The Arrowhead country is this general northeastern Minnesota, which looks like an arrowhead. Checked into Trezona House B&B, Lynn Olson and Jim MacDonald, owners. He is from Scotland. Winter temperatures here can be 60° below!

Sunday, March 30. Visited International Wolf Center in the morning, wolf flight in the afternoon. My host is Paul Hansen, P. O. Box 121, Ely, MN 55731. 218/365-7217. He is from Minnesota and works partly with the Mech wolf project, partly teaches at Vermillion Community College. Doing a M.S. on kit foxes from a school in Texas. Sigurd Olsen was long dean at Vermillion Community College, and left his mark there. This is the jumping off point for the Boundary Waters Canoe Area. Main host: Susan Meisner, Vermillion Community College; she is in charge of environmental studies.

Spent the morning at the wolf center; there are four wolves in a pen outside a large picture window. Interpreter's talk. Lunched at restaurant adjoining Piragis outdoor store, a famous one here, with Jim Brandenburg gallery also adjoining.

The study is a National Biological Survey study. The local director is Mike Nelson; I met him Monday afternoon. There are twelve wolf packs on which they have collars, about one animal per pack. There are about 2,000 wolves in Minnesota, lots more packs than this, and the population has been steadily expanding southward. One kind of collar is an ordinary radio collar, another is a capture collar that has two needles that can be radio-triggered to dart the animal. These are expensive and cost about \$ 2,500 versus about \$ 250 for the ordinary ones. There are maybe 50 wolves in Michigan, maybe 50 in Wisconsin. The Isle Royale population is not all that far from here, on Isle Royale (in Michigan, in Lake Superior), and Paul Hanson is to lead an ecology class there. That population has been followed for 35 years, the longest longitudinal study of any mammal, and is now at a historic low. Trouble can be canine parvovirus, from domestic dogs, but this is not distemper. On whether roads bother wolves, see L. David Mech, "Wolf Distribution and Road Density in Minnesota," Wildlife Society Bulletin 16(1988):85-87. There are as many wolves in

Spain, surprisingly, as there are in Minnesota (International Wolf, Fall 1995, p. 8).

Hitler loved wolves and named his retreats after the wolf.

Clear but windy, and we took the wolf flight in the afternoon, but it was too windy to find the wolves. They bolt two antennae on the struts of the wings, one on either side of the plane, and by switching from left to right antennas, which are pointed a little differently, they can get something of a directional fix. Then they circle around in tighter and tighter circle until they see the wolves--about half of the time they find them. But the winds today prevented circling much. We did see one bald eagle, nice adult in flight.

Trees here are white pine, red pine, and jack pine. Balsam fir, black spruce (in wetlands), white spruce, tamarack, northern white cedar. Bigtooth aspen, quaking aspen. Red maple, mountain maple.

Monday. Drove down to Lake Isabella area and showshoed around a campground area and further in, looking for a reported wolf kill. Eventually found it, a deer carcass. By now, since a snow two days before, the wolf tracks are obliterated, but Paul Hanson said those who were in here three days ago found wolf tracks all over the place. A recent track seemed to be that of a fisher. Common goldeneye ducks on the way back. Stopped in at the Kawishiwi Research Station, met Mike Nelson, who heads the study, and is doing deep trapping in nets, as part of the larger wolf program.

Monday night. Lecture at the college. David Tomeo is host, former Outward Bound instructor, now teaching at the college. Met Andy Hill, a canoe guide in summer and carpenter in winter.

Tuesday. Up early for another wolf flight, and this time we found them. I saw two grey, or brownish, wolves toward the edge of an open clearing, making a single track in the snow. I got them in binoculars for about ten seconds, nice view, and they went into the woods at the edge. Clear day, good sun, and great sight. We circled around several times to try to pick them up in the woods, but could not find them. The wolves were from the Birch pack, and were seen n.w. of Crocket Lake (see map). Signals were from female adult 257, male pup 567, male pup 573, and we saw the female and one pup, they were not sure which.

Returned for Radio talk, interviewed by Mike Hillman, Station WELY.

After the talk, I went upstairs to meet Bill Arthur, an editor for Jim Brandenburg, who gave me two of Brandenburg's books on wolves. Bill Arthur, 904 S. Central Avenue, Ely, MN 55731).

Lecture in Leo (Luke) Lucas, Wilderness Management class, 1,00-3.00 p.m.

Wednesday, flew home. There was snow in the night, and about 2 inches on the road, so it was a bit slow. But by Virginia, MN, it has disappeared and, though overcast, no problem.

## Sweden, Denmark, Romania

April 12-May 6, 1996. Sweden, Oxford, Denmark, Romania trip. Bits of encounter with nature here and there; a walk in the woods at Odense with Finn Arler, also a walk in the woods at Aarhus, ending in walk by the sea. Wood anemone, Anemone nemorosa is evidence everywhere; in deciduous woods it could blanket the forest floor, quite spectacular. Lots of beech forests in Denmark. In Romania, a weekend in the Carpathian mountains, lovely scenery, but rather degraded and overused woods. Hosted by Pompiliu Diplan, a graduate student in philosophy at the University of Bucharest, and his wife, and infant child. Nice spring green against the conifers. Some nice flowering trees, looked like pears, maybe some apple. One hedgehog killed roadside. A couple hawks. Tried to see the Danube and get to the Black Sea, to no avail. They kept saying it's not worth going.

June 8-18, 1996. Lusto Finland and Estonia. Aesthetics of Forests conference at Lusto, with a Finnish Forest Museum, near Punkaharju, on an esker with lakes all around. Some hike in the woods in the course of the conference, but there was not as much nature interpretation as on the 1994 trip. Lovely woods.

June 15-17, 1996. Weekend in Estonia. Stayed in Tallin but on Sunday we were taken out in the country and I got a couple strolls in the woods. Many familiar genera, though I often didn't know the species and some things I didn't know at all. Generally flat country with fewer lakes than Finland, and still lots of forests across the countryside.

Australia  
July 1 - August 19, 1996

July 1, 1995. Left Denver 5.45 p.m.

Left Los Angeles 10.40 p.m.

July 2. Skipped it! Crossed the international dateline.

July 3. Arrived Sydney 6.30 a.m.

This is Kingsford Smith Airport. He was the first man to fly the Pacific Ocean.

QUANTAS. The name comes from Queensland and Northern Territory Air Service. Ansett airlines carries the name of its founder. Bob? Ansett.

Got rental car, drove to motel. Drove to downtown Sydney. Parked and walked to American Express to cash checks. Walked through downtown Sydney shopping area. Moved car to parking lot, and walked to the Rocks, lunched at MacDonalds, walked to harbor and opera house. Drove to motel.

The motel is across the street from an edge of the University of New South Wales. The University of Sydney is the old "sandstone" university with a full set of facilities. Charles Birch is there in biology, now retired. The University of New South Wales is a post World War II university, though it is now of considerable size, approaching that of the University of Sydney. Another University here is Macquarie University. The University of Sydney had for thirty years two different philosophy departments, one in the "analytic" tradition, one in "continental" philosophy, which also meant some Marxist strains. Those two departments are now united, though the "streams" are still there.

July 4. Thursday. Breakfast at MacDonalds, drove to Geminini Lodge to make reservations for return trip. Groceries at IGA, and drove to Blue Mountains. Stopped at Glenbrook for information. Found B&B at Wentworth Falls. Drove to the Wentworth Falls Picnic Area, lunched there with Jane overheating in the car. Drove the Cliff Road Drive. Reached Echo Point, and overlook of the Three Sisters. Galahs at the feeders outside gift shop here. Tree ferns, Cyanthea, Rough Tree fern.

Drove to Govett's Leap and overlook of Bridal Veil Falls. Australian magpie. Pied Currawong.

July 5, Friday. I took the Darwin walk alone. Darwin was here and took this or a similar walk in the

1800's. Crimson rosellas. Lots of red wattle birds. Drove to Wentworth Falls and walked to overlook. New Holland honeyeater, up quite close. Returned to Blackheath and spent time in visitor center. Casuarina, she-oaks, long needle-like stems, green, resemble a jointed pine needle. The genus was split into three in 1982; most of the Australian species are now Allocasuarina. Called Casuarina because of the likeness of the drooping foliage to the feathers of the cassowary bird. Called she-oak because lumber is oak-like but inferior!

Pteridium - fern is here

The forests generally seem dry, though they call the forests in the drainage courses here rainforests.

The ranger at the Visitor Centre says she sees lyrebirds frequently.

Lunched at overlook at Govett's Leap.

Drove to Mt. Victoria and then to Bell and turned back west, back through Blue Mountains. Still quite dry-looking woods. To Kurrajong, Richmond, Windsor, then back into the Sydney suburban area, to Hornsby and took National 1 north. Dense traffic. Night at Wong. Supper in an enormous shopping centre.

July 6, Saturday. Left Wong and drove around through The Entrance, a narrow opening to Tuggerah Lake. Over a bridge here, on to Budgewoi, back to the freeway, regaining it at Morisset. North on National 1. Through gum forests, often quite dense rainforests, though often also drier and more opened up from cutting. Lots of cattle and pasture. No row cropping. Lunch at Visitor Center at Taree, in the Manning Valley. On north to Kempsey.

Geo is the Australasian Geographic Magazine.

The ocean here is called the Tasman Sea, as well as the South Pacific Ocean.

On to Coffs Harbor, a coastal resort, then to Grafton, more inland, for the night. Pizza at Pizza Hut. Grafton celebrates its jacaranda trees. This is the Clarence Valley. Red cedar (a cypress?) seems to have once been a highly desired timber tree here.

Littoral rainforest. Watered by the ocean filtered through sand.

A few banana plantations toward the end of the day.

July 7, Sunday. Drove north through sugarcane country. Often rather scenic landscape, rolling hills, with sugarcane on the flats. Also bananas. Sometimes considerable gum forests. Crossed into Queensland, and lunched at the much developed Gold Coast. Nice Norfolk Island Pines. Reached Brisbane and found the University of Queensland. Staying at Woman's College, a residence hall complex.

July 8, Monday. At the Australasian Philosophy Conference

The word "Australasian" includes Australia and New Zealand, but there is nothing Asian in the term.

Dinner: Spaghetti in a café at a shopping centre adjacent to campus.

July 9, Tuesday. Gave paper 11.00 a.m., to about 35 people. Val Plumwood and William Grey were there; he was William Godfrey-Smith.

In the afternoon, rode a bus to downtown Brisbane, and walked around. Dinner at Woman's College.

July 10, Wednesday. Drove to Lamington National Park, and O'Reilly's Lodge. Drove back to south Brisbane, and down Route 1 to Oxenford and cut off there. Thence to Canungra and booked hotel at # 35! Drove up to O'Reilly's, a resort inside the Park. Narrow, winding road, and slow drive up. Lunched on hood of car in parking lot. Passed many grass trees on the way up. Xanthorrhoea preissii. Grass tree. Common black boy. Walked to Tree Tops.

6-8 brush turkeys on the walk. Wild but rather tame. Tree tops is a suspended walkway through high rainforest. Then to a botanical gardens. King parrots. Lots of crimson rosellas at a feeding station. Pied currawong.

Took hike to Moran Falls, and joined a naturalist party on the way down. Interesting forest, lots of strangler figs. Ferns on much of the forest floor. Trees often have impressive buttresses. Jane though she caught cold here.

staghorn - the epiphytic plant on the tall trees.

On the drive back, about dusk, nine wallabies on the roadside. The first "kangaroos" we have seen. Watched them several minutes. Impressive.

July 11. Thursday. Up at 5.00 a.m. to get off at 6.00 (still quite dark) and head for Brisbane airport. The drive went smoothly. We reached the airport about 8.00 a.m. and returned the car.

Flight to Cairns. Clear day and nice flight. Arrived about 1.00 p.m. Found motel and spent the afternoon at the Visitor Centre working out tours.

July 12, Friday. By ship to the Great Barrier Reef. Went by False Cape, then Cape Grafton, and to Fitzroy Island. Saw Green Island, but didn't take the trip to land there because it is under lots of reconstruction. On Fitzroy Island, we walked around. Sulfur-crested cockatoo. Walked with naturalist with lots of ethnobotany and folk medicine in the talk. Some vines grow up to one meter a day. Dead dog tree = Beach plum = ink. Beach almond. Pandanus, false pineapple tree, with a soccer ball sized fruit, and with roots like a tepee. Fish poison tree. Coral tree. Hibiscus, yellow, turns salmon color when it falls. Can grow to 4 meters a year. Used for rope fibers and threads. Coconuts were introduced. Papaya, locally called a paw-paw, introduced. Orange footed bush hen, makes mound outside tree.

After the naturalist hike, we saw a Ulysses butterfly, with blue color, seen near the oyster research station.

On to the Outer Reef, Moore Reef. Many of these fish can change their sex under various conditions in the course of their life. Reached the outer reef and a large pontoon anchored there. Lunch.

Ride in semi-submersible boat. The coral is quite intricate. Staghorn coral, but not all that colorful. Colorful fish, some large swarms of small fish. No big fish seen. Parrot fish. Returned and went snorkeling off the pontoon. The water temperature is quite pleasant.

Crown of Thorns starfish (COTS) outbreak. This is a coral eating starfish. It destroys an area, but there is a recovery after about twenty years. Many think this is a naturally occurring phenomenon. The starfish turns its stomach inside out to envelope the coral.

July 13. Saturday. Drove north to Daintree River Ferry for a river cruise.

Northern bandicoot, killed roadside. There can be up to 3 meters of tide, about 2 meters today. Mangroves. There are here 3-3 ½ meters of rainfall a year. In March 1996, 1.6 meters fell in four days, the flood of the century.

In the "river train," a long boat. Two crocodiles, "salties" at the water's edge. The first one was at first swimming in the water. The largest crocodile in Australia was 24 feet long. The largest of the two was a male, about 8 feet. Also one juvenile crocodile about 3 feet long, in the sun on one of the mangrove beaches.

Mangrove makes long pods; a new plant will sprout from a pod while it is yet on the tree. Then it floats in the river.

A green tree snake, which I never saw. Another one later, which I did see.

Mt. Thornton, mountain on the skyline. One of the highest in Queensland, about 4,500 ft. Large egret, all white. White-faced herons, 6-8 in a tree.

Another crocodile, about 4 meters long, seen nicely at the river's edge, half out of the water. Two more crocodiles, one half out of the water in the sun. Two more egrets.

Stopped for tea. Boardwalk through the mangrove swamp. Green ants, squeeze one and put a drop of it on your tongue. Lemon taste.

Archer fish, with spots. Mangrove jacks, reddish fish.

3 crabs

looking glass mangrove, with buttresses

strangler figs

Malaleuca trees.

The Gulf Savannah region is savannah, a name for all the inland savannah, near the Gulf of Carpentaria.

Fan palm, with leaves like a fan.

End of the boat train ride, returned to the Ferry.

Drove to Daintree village, and lunched there.

Drove to Mossman and Mossman Gorge. Hiked about 4 km. One km in and then a 2 km loop and then 1 km back out, dense rainforest. Impressive strangler figs and buttress roots. Jane did only part of this.

July 14, Sunday. Drove to Kuranda and walked through the market. Lunch on the back of the car at Barron Gorge Waterfalls.

There were cannibals in Australia.

There is less burning of sugar cane now, mostly it is still burned in wet soil fields. A sugar cane mill is self contained; it uses the cane by-products for its fuel.

Left at 3.30 on wildlife tour, Wildscapes Safaris, led by Alberto Vale (originally from Portugal). Drove south and turned toward Atherton, Gillies Highway. Drip tips on rainforest leaves aggregate the cloud moisture into a drip. Dry sclerophyll forest. There are no grasses in the rainforest. There are straight tall trees with no knots. There are no koalas this far north; it is too hot for them.

We drove through the rainforest and then through some cattle country, then thru Tinaburra and table lands.

Watched for platypus. One seen swimming like a beaver. Then one seen well swimming by. A good look for only ten seconds or so, but a memorable experience. Another seen swimming back at the place where we had first watched and failed to see it. The platypus is a monotreme; it all comes out one hole: feces, urine, and offspring.

The Platypus (Ornithorhynchus anatinus) is only in the eastern belt of Australia, not much west of the Great Dividing Range. It remains common in Tasmania. Distribution map on folder below. It is not said to be endangered or threatened.

Platypus, a folder produced by the Australian Nature Conservation Agency, February 1996, is on hand. M. Griffiths, "The Platypus," Scientific American, May 1988.

The female platypus has no teats. Milk is produced in large glands under her skin which can be up to one-third of her body's length. The milk oozes out onto a patch of fur and the young platypus sucks it up.

The male has a spur on the inside of each hind leg with a venom gland. This can cause excruciating pain in humans and can kill a dog. They are used against other males in mating season.

No one has ever seen a platypus lay her eggs. It is thought likely that she sits in such way that the eggs pass out and slide onto her abdomen. There are one to three eggs, soft and about 14 to 17 mm. in diameter. She lays on her side and curls her tail to keep them warm against her body. There is no pouch, unlike the echidna. The young hatch after about ten days. They are about the size of a peanut, have no hair and cannot see. The mother keeps them close against her abdomen where they suckle on her milk. They are weaned after about three to four months. Many do not survive the first year.

Dinner in restaurant.

Seen with spotlight: brush tail possum, another brush tail; rufous ringtail, nicely seen; it went into a hole in the tree. Coppery Brushtail. Lemuroid ring tail, of which I saw mostly the eyes. At the curtain fig tree: Long Nosed Bandicoot, on the ground. Coppery Brush trail, across the road. Green Ring tail, silver stripes, nicely seen. Lumholtz tree Kangaroo, nicely seen, with long tail.

Back to stop for chocolate. On the ride back, two small long nosed bandicoots on the road. (Giant) white tailed rat, white tail nicely seen. One long-nosed bandicoot.

July 15, Monday. Drove down the coast. 10 wallabies on a hillside, watched from the road. Passed Mt. Bartle Frere, Queensland's highest peak, 1,622 meters.

Reached Mission Beach, turned off at El Arish and into Tam O'Shanter State Forest. Looking for cassowaries. Walked a loop, 40 minutes, on the north side of the road with noisy tourists, Lacey Creek Forest Circuit. Then drove down to Licula Walking Track which I was going to walk through 2.4 km, but Jane found the cassowaries. Splendid views. One adult male and two chicks, though we did not know at the time watching it that the male cares for the chicks. Nicely seen at length in good rainforest for half an hour, quite close, so close that we backed off a bit. Two chicks with stripes.



Then others came, including two French boys who made too much noise.

On to Mission Beach, watched a video on cassowaries at the interpretive center. Picnic lunch in palms on the beach. Drove to old Mission site, in 1914, to the aborigines who were being abused by Chinese growing sugar cane. Returned to the walking track and went down it again, briefly. Photographed cassowary dung; certain large seeds do not sprout unless they have been through the cassowary! So they are necessary for the rainforest.

Drove south to Townsville and found James Cook University. Our lodging was at John Flynn College, in the home of the principal (head of the college, a residential unit). The John Flynn College, James Cook University, Townsville, Qld 4811. Wallaby seen when returning to the house. Our host is Lachlan M. Marsh, was in mathematics, now the principal. His wife is Helene Marsh, in biology. She is writing a book on manatees and dugongs with O'Shea, National Ecology Center in Fort Collins, coming to the U.S. in November-December.

D. A. Saunders, A. J. M. Hopkins, R. A. Hau, eds., Australian Ecosystems: 200 Years of Utilization, Degradation, and Reconstruction. 1990, Proceedings of the Ecological Society of Australia. Chipping Norton, N.S.W.: Surrey Beatty and Sons, 1990.

Craig Moritz and Jiro Kirrawa, eds., Conservation Biology in Australia and Oceania. Chipping Norton, N.S.W.: Surrey Beatty and Sons, 1994.

Bates, Gerry M., Environmental Law in Australia, 4th ed. Sydney: Butterworths, 1995. 405 pages.

James T. Winpenny, Values for the Environment: A Guide to Economic Appraisal. London: HMSO (Overseas Development Institute), 1991. Winpenny is a development economist in London.

Australia's Cape York Peninsula. National Geographic, June 1996.

Cocks, Douglas, Use with Care: Managing Australia's Natural Resources in the Twenty First Century. Kensington, N.S.W.: New South Wales University Press, 1992. 344 pages. Cocks is a research scientist with the Division of Wildlife and Ecology, CSIRO (Commonwealth Scientific and Industrial Research Organization) in Canberra.

July 16, Tuesday. Breakfast at the college. Checked equipment with Wendy Power. Met the Philosophy Steering Committee.

Drove around Townsville and then to Commons Ecological Park, a wetland when there is rain, but now dry with some bird ponds and hides, which do collect the birds in dry weather. Saw Magnetic Island off the coast. Brolga, a large grey crane, with red head. One adult and two immatures seen. Straw-necked ibis, lots of them. Royal spoonbill, with black bill. Yellow-billed spoonbill, with yellow bill. The two spoonbills were side by side, one of each. Magpie lark. One wallaby out near a pond. Great egrets.

Drove up Castle Hill.

Lecture at 5.30. Dinner at Marsh home that evening.

July 17, Wednesday. Plane to Brisbane. Talk that night at Queensland University of Technology (QUT). Afterward, dinner in a noisy pub. Julian Lamont, QUT, main host; Christy Favor, QUT, an American; Noel Preston, QUT, studied theology at Boston University. Malcolm Parker, a physician in general practice, was a philosophy student and former student of Robert Elliot. Trevor Jordan,



QUT. Elizabeth Saxon, sat beside me at supper, doing an honors' thesis on environmental philosophy. John Forge, Griffiths University, in philosophy of science. He had been to University of Pittsburgh and used some of my articles in a class there. Jerry Gaus, recently come from the University of Minnesota at Duluth, knows Michael Losonsky and Jane Kneller. Lamont was a post-doc at the University of Queensland and only a few months ago took a permanent job at QUT.

Thursday, July 18. Got haircut. Drove north to Maroochydore. Sugar cane and pineapple country. Striking Glass House Mountains, volcanic necks rising suddenly from the coastal plains. Reached Maroochydore, lunch with Robert Elliot. Toured his campus, a new university college, started from scratch. He is Dean and was the only appointee in Arts, and therefore dean of himself. He now has 13 faculty and will have 26 next term.

There are kangaroos on the edge of the campus.

Walked around to the beach about sunset. Surfers. Nice Norfolk Island Pine in the motel area.

Hoop pine is another Auracaria, with thick clumpy dark green foliage, native to Australia, seen here. Bunya pine, still another Auracaria, native to Australia, not seen.

July 19, Friday. Day at Noosa National park. Noosa Heads. Walked around to the beach near the motel again in early morning. Surfers again. Spent the day with Elizabeth Baker as our guide. 2/127 Gray Road, Hill End, Qld 4101. 07 3844 5394. ebaker@scuc.edu.au

Drove north to Noosa Heads.

Mary E. White, The Greening of Gondwana. Chattswood, N.S. W.: Reed, 1994. 2nd ed. ISBN 0 7301 0390 0. Later seen at the University of New England. Princeton University Press published a 1990 version, The Flowering of Gondwana.

Australia as a recognizable continent is relatively recent (30-50 million years ago). Earlier it was in Gondwana, which was all the southern continents fused together, including Antarctica. At that time, the northern continents (Europe, Asia, North America) formed a second supercontinent, Laurasia.

On the walk from the parking area. Eucalyptus may have striped bark as well as clear bark.

The special character and uniqueness of the Australian flora depends on the omnipresence of the genus Eucalyptus. No other comparable area of land in the world is so completely characterized by a single genus of trees. Acacias are almost as widespread and visible.

A peculiar and distinctive quality of the Australian flora is the adaptation resulting in leathery, hard, spiny or reduced leaves. This is called scleromorphy, and the plants whose leaves are adapted in this way are schlerophylls. The evolution of schlerophyll adaptations is believed to be primarily related to low-nutrient soils and secondarily to confer the benefits of water conservation under dry conditions.

The Gondwanan forests are often thought to have been wet rainforests, and schlerophylls a subsequent adaptation, but it is not really known that the Gondwanan forests were closed forests or wet forests.

Schlerophyll forests regularly burn; they are often dry and the leaves are full of oils. They have many fire adaptations. Lots of the seeds only sprout after a fire.

Melaleuca (mela, black; leuca, white). Tea Tree. Mottled black and white bark on some of them. Bottlebrush flowers.

Leptospermum with papery bark.

Pandanus a palm tree with somewhat Yucca like leaves.  
Screw palm, edible fruit and nut, at least by the aborigines.

Acacia, wattle.

Kookaburra, seen nicely in tree, and got good pictures.  
Lovely walk. Returned to car and picnic lunch there.

Found a koala up in a tree at the edge of the picnic area, got pictures. Watched it some while, though it was mostly asleep.

Crested pigeon.

Walked a boardwalk. 2 galahs. Jane saw them perched, and I saw them in flight.

Ice cream at Baskin Robbins. Drove back. Pelican overhead. Drove down to Sunshine Coast University College. Saw kangaroo with joey in pouch, with head sticking out. Security cop made me move, and when he got out she took off. A couple more kangaroos.

July 20, Sunday. Drove to Armidale. Left 6.30 a.m. to Caloundra, still on the sea, and turned inland. Beerwah, some impressive eucalypt forests in here. Kilcoy, bought gas. Esk, high country with sheep on lands cleared from eucalyptus. Reached New England highway at Hampton. Toowoomba. Warwick, Stanthorpe, Wallangarra, Tenterfield, Glen Innes. Many Scots and English names through here. Sheep, fruit trees, apples, grapes. Reached Armidale about 5.00 p.m. and stayed at Comeytrove Bed and Breakfast. Clear day, cool but pleasant. Supper at Kentucky Fried Chicken. Drew Klentzos came round in the evening, my host at the University of New England.

July 21, Sunday. Hard rain in the night, came down in blowing sheets. Early a.m. some bright spots, some rain. Nice breakfast in the B&B. Drove to Dangar's Falls in Oxley Wild Rivers National Park (one of several units). Clearing and windy. The last 11 km was on dirt road. Lots of magpies. Freckled ducks, seen nicely. A few rosellas. Many sheep in dry fields, the brown sheep often about the same color as the fields.

Walked to Gorge Lookout and Gorge Rim Walk, and around to Dagar Falls Lookout and on to Rock Wallaby Lookout. The brush-tailed rock wallaby is rare here, not seen. A spectacular falls. Three wallabies seen, 2 watched at length, then a third one (across the dog fence), seen only briefly. They have a dark tail, brownish, and somewhat reddish backs. Windy. Return to car. Ate in car at Parrott's War Memorial, halfway back in toward town.

Left Jane at the B&B, and I drove to Wollomombi Gorge and Falls. There are two falls at Wollomombi: one is Wollomombi, which is the larger, and Chandler Falls, on Chandler River, both seen at once. Cool and windy. Walked to lookout. Returned and on the way back drove to Metz Gorge. About 30 rosellas in a flock on the way in.

Eucalyptus trees here are often dead or dying in the open fields, and there is a mysterious Eucalyptus dieback, not well understood. Some say a pesticide affects bird eggs and the birds don't eat the insects that damage the trees. Others say the dieback is natural and cyclic.

The University of New England has 4,000 "internal" students and as many "external" students (correspondence students) who come in for two weeks when the internal students are on holiday.

July 22, Monday. Breakfast at the B&B. Drove to the University of New England, on edge of town. Phoned Canberra from a phone booth out in the cold. Brief visit to the library.

Seminar at 11.00 a.m. Drew Khlentzos, the main host, very cordial. Tony Lynch, young, recent Ph.D., now teaching environmental ethics here, since Robert Elliot and William Gray have left. The Dean of Natural Sciences was at the seminar. Others from ecosystem science. Lunch afterward. Fred D'Agostino at lunch. He is a U.S. Citizen, has been here 25 years. He wrote "Transcendence and Conversation: Two Conceptions of Objectivity," American Philosophical Quarterly, April 1993, on hand. The Chair is P. Forrest, whom I did not meet.

We left about 2.15, drove to Uralla, then Tamworth (bought gas), then Gunnedah (groceries for supper), leaving there about 5.00 and driving south into the dark. One wallaby jumping across the road. Rosellas. Galahs. We were uncertain about what kind of motel we might find, but we found a very decent one at Coolah.

July 23, Tuesday. Left at 6.00 a.m., still dark, heading South. Frosty car, but, fortunately, the motel keeper had covered the windshield. Roosters were crowing in the dark morning, a not uncommon sound in these towns. We drove south to Gulgong. Two kangaroos in a field, running, in the early morning light. Later, between Gulgong and Wellington, three rabbits in open brush and trees, like cottontails. Then 21 kangaroos on a hillside. We watched them in the early morning sun quite a while. I made them out to be Eastern Grey Kangaroos. They were various sizes, but the largest were quite good sized, 1 ½ meters head and body, with 1 meter tail or more. They are a lighter color than the wallabies. Nice sight.

Gas in Canowindra. One more kangaroo in a field. Many sheep, and now the fields can be quite green with barley, or something that looks like a turnip. The sheep in these fields are in some contrast to the sheep seen earlier in dry brown fields in the Armidale region.

Galahs in a park/golf course area in Cowra, perhaps a hundred of them, first on the ground (took picture) and later up in trees (more pictures). Magpies. Parrots, some all green color. A falcon, like a kestrel.

Lunch in Boorowa, in a café, and visited a men's store with curved counters, of which they were quite proud. On to Canberra, reaching there about 3.30 p.m. Checked into University House, Australian National University.

July 24, Wednesday. Spent day in Canberra. Jane did wash in the morning. We walked to the bookstore at ANU. Lunch in University House in the room.

In the afternoon, we visited Parliament House. A magpie stole the diplomat's lunch on the patio! Later, visited the Botanical Gardens, with a reconstructed rainforest. Rock gardens. Wattles nicely in bloom. Scribbly gum. We had an excellent and enthusiastic volunteer guide, who had been with CSIRO for his career, now retired.

Wattles are acacias. Acacias are found widely in South America and Africa; they are thorny there, but not in Australia. But the term "wattle" is restricted to Australia, and comes from their use in an early settler's type of construction "wattle and daub," mud around interwoven long, flexible stems. Many have leaves, but many have lost their leaves and have instead a leaf-like flattened narrow stem (phyllodes). Others have only modified stems called cladodes. There are 800 Acacia species in Australia. Few grow into trees; they are shrubs.

Evening, we had dinner at an Asian restaurant in the Student Union. Then a seminar at ANU, with only a few present. It had been little publicized, though those there were cordial. Robert Goodin.

Rose, Deborah Bird, Nourishing Terrains: Australian Aboriginal Views of Landscape and Wilderness. Canberra: Australian Heritage Commission, 1996. 95 pages. ISBN 0 642 23561 9. Rose, an anthropologist, is with the North Australia Research Unit of the Australian National University, Canberra.

Mathews, Freya, ed., Ecology and Democracy. London and Portland, OR: Frank Cass, 1996. Nine contributors. Originally published as volume 4, no. 4, of Environmental Politics.

July 25, Thursday. Drove to Braidwood. Examined a wombat, killed roadside. Examined a kangaroo, killed roadside. At least 1.5 meters head and body, plus 1 meter tail. Eastern Grey Kangaroo. Visited shops in Braidwood, though several of the antique shops Jane wanted to visit were closed.

Reached Val Plumwood's home after 5 km drive down her narrow lane, with brush on either side, trying to avoid getting the car scratched. Lunch outdoors in her lawn/garden. She has solar electricity and hot water. Pit toilets. There is a phone cable dug under her road. In the afternoon, she took us for a walk through her rainforest. Not far away there is a view over an escarpment and you can see the Tasman Sea in the distance. Lots of tree ferns. Mostly soft tree ferns, but later rough tree ferns, with prickles at the bases of the fronds. Lyrebird "dancing" mounds. About 4 feet in diameter, for courting. Saw remnants of half a dozen of these. Saw a bowerbird bower, now abandoned and I would not have known it was anything at all, unless I had been told. Val knows the natural history quite well, better than any other philosopher I met in Australia.

Plumwood - a tree here. It starts to grow up in another tree, typically a tree fern, and grows to the ground, and then up to become a major tree. Lots of younger ones seen clasping tree ferns. They get quite sizeable, and the main tree rots and sprouts arise around it, and they too get sizeable, still in a ring around the now vanished original tree.

Tree ferns fall over under their own weight, but the tip will bend around and start growing again. If the wallabies don't eat the fronds too much, it will repeat the cycle, and this can go on for centuries. The wallaby here is a swamp wallaby.

Heard a bowerbird call.

Heard a thrush call.

Eastern yellow robin, seen as we returned at dusk.

Returned to house. Made up bed in her guest house.

Evening by the fire with Val Plumwood. Heard her crocodile story, which happened at Kakadu National park, Northern Territories, near Darwin. She was attacked by a crocodile in her canoe,

and barely survived.

Antechinus stuartii, Common Antechinus, the size of a rat, came into the kitchen to clean up the scraps. Seen eating an avocado. A marsupial carnivore, but it eats avocados anyway. Eats insects, arthropods.

About 9.00 at night, a visit by her wombat. It is now wild, though she once raised it, after its mother was killed. It scratched on the outside door, came in, ate two carrots and barley flakes by the fire for 30-40 minutes. I took several pictures. Vombatus ursinus. A somewhat relict group, most of them became extinct before humans reached Australia. Now found only in s.e. Australia, a rather limited distribution. It grazes in her yard at times. She puts up a fence to keep out the kangaroos, though she has to make a wombat gate because she can't keep it out. It digs under the fence or tears it down.

We spent the night in the guest house. Cold, but at least warm under the covers.

July 26, Friday. Left at 6.15 a.m., driving out the 5 km. driveway in the dark, though it was light by the time we reached the gate. Drive back to Canberra. Jane saw one kangaroo on the side of the road. I missed it. Gas and regrouped at Queanbeyan. Airport, and flight to Melbourne, short flight.

Car rental, and found hotel. Lygon Lodge. Drove to Dandenong Ranges National park, in terrible traffic. This is about 20 miles east of Melbourne. When we eventually got there there were some quite impressive tall Eucalyptus trees, Eucalyptus regnans, tall, spectacular for their columnar appearance. There are 38 species of ferns and fern-like plants here. The park is generally under siege by the city, but there are determined efforts to preserve it. Return after dark.

July 27, Saturday. Trip to Phillip Island. Drove to Dandenong and the car gave trouble shifting. So we swapped it for a Ford at Budget Car in Dandenong. Drove on down south. South Gippland Highway, and thence Bass Highway, then onto Phillip Island. Visited Koala Conservation Centre, and had quick lunch. These are fenced koalas, though in a large area in natural habitat. Nine koalas, some on a boardwalk maybe 20 feet high. All asleep.

Drove on to Cowes, and took boat to see Australian fur-seals, Arctocephalus pulsillus. There are 4,000 or so here; which we saw. We saw thousands on the rocks and a hundred or so swimming in the water beside the boat, popping up to take a look at us. Spectacular. They were so inquisitive as to suggest that they had at other times been fed, but there was no feeding while we were there. Seals have no external ears. The Australian sea-lion (Neophoca cinerea) is also on the southern coast of Australia, but not here, and has external ears.

Lots of cormorants and gulls also seen. Kelp gull. Pacific gull. Pied cormorants, mostly. Little pied cormorants. Great black cormorant. Silver gulls, seen on grassy Nobbies.

Returned by boat closer in to sea caves.

Went to the penguin parade. Little (Fairy) Penguin. This is the only penguin to make its base in Australia. They came out of the ocean in groups of 12-15, starting at 5.45 p.m. in the dark. We saw perhaps 200, some closer in. The waves would come in and knock a whole group over. They would gather and then run across the beach and into a hill covered with low vegetation where they had burrows. The males are staking out territories, at this time of year. They had been at sea feeding for the day. Various ones were seen closer at hand as we returned up the boardwalk.



**Wombat at Val Plumwood's**

**July 25, 1996**



Drove home in the dark. Kentucky fried chicken halfway back home.

Penguins are found only in the Southern Hemisphere.

July 28, Sunday. Drove southwest to Geelong (pronounced juhlong), then Torquay, and the Great Ocean Road. Kangaroos on a golf course at Anglesea. About 50 seen, all sizes, said to be kangaroos and mostly females and joeys.

Lunch at Lorne in a scenic picnic area.. Cloudy bright at best, often overcast. On to Apollo Bay, got motel about 2.00 p.m. It is quite scenic between Lorne and Apollo Bay, a seaside drive. Continued west. Some nice Eucalyptus forests here.

Near Princeton, black swans, 8 of them. Watched them some while, the first I have seen. Dusky moorhen on pond.

Reached the Twelve Apostles. Some eight seen from one location.

Loch Ard Gorge. A ship wrecked here in 1878, 52 people died, 2 survived. A narrow gorge carved in by the sea. This is the Shipwreck Coast. The Island Archway (took picture). Muttonbird Island (short-tailed shearwater). This bird flies to the Aleutian Islands up by Japan and down the California coast, 30,000 km, up to 600 km per day.

I walked in to the Blowhole, 100 meters inland and yet the sea has carved out an underground tunnel this far in.

July 29, Monday. Drove back to Melbourne. Overcast day. Leisurely drive, little traffic on the road. Looked at juvenile Eucalyptus leaves.

Stopped at Anglesea golf course again. Took pictures of kangaroos. Bought American hot dogs for lunch.

Jane did a woolen museum tour in Geelong.

Rain

Eucalyptus - sheds its bark once a year, rather than its leaves! Nearly 90% of Australia's plants are found nowhere else in the world (endemics). Most plant families have members with relatively small, rigid or hard leaves, sclerophylls, adapted to dry conditions and poor soil. There are layers of hard cells beneath the leaf surfaces that keep them rigid. Or they have long, narrow leaves. Or no leaves, reduced to scales along a green stem.

She-oak. The wood is like oak -- hard, dense, straight grained, but not as good a real oak (he-man oak!), a weaker oak. But others doubted this etymology.

Eu-calyptus. Eu-calyptus, a true cap. The flower buds of all species have an operculum (cap). The world's tallest hardwood is a eucalypt in Tasmania, nearly 100 meters tall, the length of a football field.

Grass trees. Xanthorrhoea, a distant relative of lilies. Among the slowest growing plants in the world, it puts out only one new circle of leaves each year. They go back 100 million years.

Australian farmers lose 4 kg. of soil to produce a loaf of bread. The soils are old, and from alternate



floods and drought, much compacted. Half of Australian farmers lose money in any given year.

Back in Melbourne about 4.00.

Dinner with La Trobe University Philosophy faculty. Col's Café.

Freya Mathews

Alec Hyslop, from Edinburgh originally

Robert Young, rough face

Aaran Gare

Ross Phillips, sat beside Jane

student and tutor from University of Melbourne, using "Values in Nature" and "Disvalues in Nature."

July 30, Tuesday. Spent day in the stores in Melbourne.

Ate kangaroo pie for supper.

July 31, Wednesday. Lecture at La Trobe University. 11.00 - 1.00.

Robert Young, chair of dept.

Freya Mathews

Ross Phillips

Alec Hyslop

John Fox, full beard, philosophy of science, sat opposite me at lunch

John Bigelow, from Monash University, on leave at La Trobe. I conversed with him quite a bit.

Freya Mathews and Janna Thompson both teach environmental ethics. Mathews teaches ecology and feminism. She only works half a year by choice.

Hayden Ramsay, a recent Ph.D. from the University of Edinburgh, knows Cheryl Foster.

Arran Gare also came

Purusottoma Bilimoria, from Deakin University, came. I met him in Boston.

August 1, Thursday. Flight to Hobart.

Met by Kate Crowley and baby girl, Alouisa. She teaches a class in Environmental Politics. Went to B&B and information center.

Crowley is pronounced kraugh, rhymes plow, ley. The Olympics were going on in Atlanta, Georgia, and she had a cousin who was making national news winning her races.

August 2, Friday.

11.00 met Wawrick Fox and drove up Nelson Mountains.

1.00 lecture at University of Tasmania.

Pete Hay, Centre for Environmental Studies. He teaches a class, "Environmental Values" in the Centre for Environmental Studies.

4.00 lecture, Nature and Culture, with panel. Panelists:

Pete Hay, Centre for Environmental Studies

Kate Crowley

Jerry de Gryse, landscape architect, her husband, from Detroit

David Stephenson, photographer and arts.

Dinner in Japanese restaurant. At supper: Paulus Berensohn, crafts, American, from Penland School of Crafts, near Roan Mountain, NC, Spruce Pine, Bakersville, NC area.  
Peter Adamas, American, now Australian. Makes furniture. Both of them were sort of deep ecologists.

Echidnas are active by day and Pete Hay sees them off and on.  
Platypus he never sees.

Tasmanian devils are mostly around campgrounds at night.

They are black and their eyes don't reflect light, and they are hard to see at night.

August 3, Saturday.

Got rental car, a rainy morning. Walked to the car rental at a gas station in the rain. Drove toward Port Arthur. Eaglehawk Neck. Tessalated Pavement, rocks with a squarish grid, look a bit as though they had been laid by a mason, at the sea's edge. Blowhole. Tasman Arch. Devil's Kitchen, all interesting coastal erosion formations.

Lunch at Tasmanian Devil Park. Toured the Park. Tasmanian Devils. Bennett's Wallabies (=Red Necked Wallaby)  
Eastern Quoll

Toured Port Arthur Convict ruins. Masked lapwings on lawn.

Returned to Fulham Cottages B&B, a "property" or "paddocks" with 6,500 sheep!

Night ride, with John Hamilton, director of the Tasmanian Devil Park. He has tried feeding them to show them to tourists at night, but failed.

brush tailed possum

rabbit

2 pademelons

rabbit

7 pademelons

2 Bennett's wallabies

3 pademelons

3 Bennett's wallabies

2 pademelons

more pademelons

2 possums

Bennett's wallaby

4 possums

5 possums

2 Bennett's wallabies

3 pademelons

3 possums

1 hare

August 4, Sunday.

Up at 6.00 a.m. and do-it-yourself breakfast in the cottage. Fine, cool day, at the start (!), though

it later deteriorated. Wombat killed on road. Drove to Hobart and on to New Norfolk, rain shows, then steady rain. About 24 black swans on a wetland pond. Steady rain. Picnic lunch near a power plant.

to Derwent Bridge, with gaining elevation, first freezing rain, then snow. Quite wintry by the time we reached Derwent Bridge. Found hotel room, cold, and turned heat on.

Drove to Lake St. Clair and visitor center. 1 wallaby along lakeshore.

Drove on to Franklin-Gordon Wild Rivers National Park - on the Lyell Highway. Mixed snow and rain.

View over into Surprise Valley. I took a short walk in the Franklin River area.

I also took a 45 minute walk to Donaghy's Lookout, over the river gorge. I could see down, but not up, too cloudy. Otherwise I would have seen Frenchman's Cap, a famous one. It looks something like Yosemite's Half Dome, to judge from the pictures. There is Huon pine (Dacrydium) in the gorge.

Returned to the hotel about dark, cold and snowing.

There is lots of rainy weather here. It rains 7 days out of 10, is cloudy 8 of 10, and the sun shines all day only one day in 10. It snows 54 days a year.

There are grassy areas with buttongrass. They are natural, it is too wet there for trees; the grassy areas do not result from either Europeans or aboriginals.

The elevation is about 750 meters here. We are surrounded by peaks 1300-1500 meters.

August 5. Monday. 5 inches of snow. Breakfast in a cold dining room. We drove back toward Lake St. Clair only to find a big gum tree had fallen across the road. Backed up, tried to turn around and got stuck, forgetting the car had front wheel drive. But workers came by almost immediately and got me out.

Drove back up the Lyell Highway. It was rather icy. Returned to Lake St. Clair and the tree had been cleared from the road. Walked in to the Watersmeet area. This is Cradle Mountain-Lake St. Clair National Park. Pademelon. Black currawong, very tame, on the rear view mirror of the car.

We headed back toward Hobart. Lunch at the same spot, near power plant, as the day before.

Dusky moorhen, near New Norfolk, about six of them.

Bed and breakfast in Sorrell, pizza for supper. Reasonably good weather from noon on.

August 6, Thursday. Had to cancel a Wilderness Flight to the Southwest National park and Bathurst Harbour, there was a cold front coming through and it wasn't safe to fly.

Drive to Richmond, to see convict-built bridge.

Drove up the East Coast. Ferry at Louisville to Maria (muh rhe uh) Island National park. Very blustery and overcast. We were the only two on the ferry. We walked around an hour and a half, to see the Fossil Cliffs. 3 pademelons. 1 Bennett's wallaby. 12-15 Tasmanian Native hens. 12-15 Cape Barren geese. 5-6 Flame robins.

Cape Barren is the easternmost cape on Cape Barren Island, north of Tasmania. Despite their name, Cape Barren Geese are only distantly related to geese in the rest of the world. In some cases, farmers regard them as pests in their fields.

Convicts once were on Maria Island; later there was a cement plant.

I walked down to see the fossil shells up close; the cliffs are enormous stacks of fossil shells. It was too windy for Jane; she went on around.

Several thousand wallabies and kangaroos were culled from Maria Island. Neither species is native here. Pademelons are native.

Tasmania is the most mountainous island in the world.

August 7. Wednesday. Flight from Hobart to Melbourne, thence to Adelaide. The Melbourne flight was delayed an hour and a half because 11 persons checked bags in in Melbourne (where the plane was coming from) and didn't get on the plane. Flight Melbourne to Adelaide.

Met by Lawrence Johnson and Pen Horner, a local environmentalist. They took us to the Esplanade Hotel, on the beach. Pen Horner, 16 Parkmore, Sturt 5047, SA.

August 8, Thursday.

Bush walk with Lawrence Johnson, in the Lofty Mountains, about 12 km, over Mt. Lofty Summit, 730 meters. Cool, cloudy, but not rain. We walked variously through disturbed and relatively undisturbed forest. This is really just a rural hike through semi-suburbs of Melbourne, with some preserved areas. Nice wattles in flower. Part of the hike went through Mt. Lofty Botanic gardens. New Holland honey-eater. Scarlet robin. Wood duck = Crested goose. Pacific black duck. Australasian coot. Little raven. Adelaide rosellas. Eastern rosellas. Superb blue wren. Pied cormorant. Eurasian coot.

The Lofty Mountains are a southern extension of the Flinders Range, which, further north, is beautiful but barren. Rare in the Flinders Range is the yellow footed rock wallaby, seen in Cleland Sanctuary.

Dinner at the hotel with Lawrence Johnson, George Couvalis and Linda Burns.

August 9, Friday. to Cleland Wildlife Sanctuary. Rainbow lorikeet. Mountain Duck. Magpie goose. Sacred Ibis. Kookaburra. Birds in the area.

In the park, confined animals. Red Kangaroo, with a white stripe mouth to eye, a distinguishing mark. But only the males are reddish; the females are quite blue-gray.

Dingoes. I first heard them howl, like a cross between a coyote and a wolf.

Koalas

Western Grey Kangaroo, with joey. close-up pix.

Euro - with joey, in a rocky area.

By account in the literature at Cleland Sanctuary, kangaroos with feet less than 35 cms. long are classed as wallabies.

Lunch at Flinders University

Seminar at 2.15 p.m Chris Mortenson, John Chalmers, from the University of Adelaide, were at the lecture and stayed to talk. He incorporates some environmental ethics into a moral philosophy course.

Evening. pizza at Pen Horner's home.

On the Adelaide trip, I probably should have gone to Kangaroo Island, but did not know this in time to arrange it. The kangaroos there are a subspecies of the Western Gray. One reason for the wildlife there is that there are no foxes, rabbits, cats, and other European animals, also it is relatively free of weeds.

August 10, Saturday. left hotel 10.00 p.m. With Lawrence Johnson, we drove down the coast to Aboriginal Spring site. The folk tale is that a boy killed an emu and died under a curse. His maternal uncle carried his body to Kangaroos Island, shedding tears when he stopped to rest. Hence the springs.

Then, we went on further south to a geological site. Glacial striations and the rock column. Quite a contrast of the folklore and the science.

Flight Adelaide to Perth at 1.40 p.m.

Adelaide to Perth by road is 2,700 km, over the Nullarbor Plain. Null-arbor is bad Latin for no-trees. The Nullarbor Plain road, a transcontinental highway, was finally surfaced only in 1976. It is the only transcontinental highway, east to west, in Australia.

We flew over the Great Australian Bight, a cloudless day.

Then we flew over land, looking like a scrub forest, and many hundreds of dried salt lakes. Few signs of human habitations, though there were occasional roads. Flight path is over Cape Arid National Park.

Route 1 runs around the perimeter of the nation, supposedly.

Western Australia is 1 million square miles, four times the size of Texas. It has 8,000 miles of coastline. The nearest big city to Perth is Adelaide, 1,700 miles away.

Met by Andrew Brennan.

Dinner with Felicity Haynes, Dean of Education, Jeff Malpas, Murdoch University, and his wife, a librarian, and Victoria Morgan, a student of Felicity Haynes.

August 11, Saturday. Drove to Darling Range. To Jarrahdale, then to Sullivan's Rock. Hiked there for lunch under pine trees. Drosera erythrorhiza. Red ink sundew. In bloom. Also one is a vine, Drosera spp., with small cup-shaped leaves.

Drove to Mt. Dale, and walked up firetower. Lots of grass trees in the forests. Especially lovely in the evening sun. Some lovely wattles. Drive to John Forest National park and looked about dusk for kangaroos. None seen. One wallaby glimpsed alongside the road in the dark, on return. Spotted turtle-dove. Galahs. Australian ringneck parrot = Port Lincoln parrot. pied cormorant. Long-tailed black-cockatoo, seen at twilight.

quongan (pronounced kwong gan) - name for the coastal, sand plain vegetation.

jarrah forest - the dominant Eucalyptus is jarrah. E. marginata.  
karri forest (E. diversicolor) is further south.

Saw an emu farm.

1080 is a natural toxin in Australian eucalypts, and it doesn't bother marsupials.

Cinnamon fungus - causes dieback in Eucalyptus.

Bottle brush.

Kookaburra heard calling.

roobar. A bar up front on the car or truck to hit kangaroos

bullbar.

The Northern Territory is not a state but a territory.

August 12, Monday. Drive north to New Norcia (norr-ree-kuh) and a Benedictine Monastery there.  
Drove through Muchea, Gin Gin, Mogumber, and then to New Norcia.

camels in fields en route.

camelier, a person who handles camels, often Afghan.

rain showers

The pastures ("paddocks") are quite green now, though they become brown later in the year and are brown most of the year.

soup and a roll in a roadhouse. Clearing and better weather.

Drove to Moora and on to the Pinnacles, in Nambung National Park.

Echidna. Seen crossing the road, and we went up on the hillside and watched it quite a while. It flattens down and balls up and presents a bundle of spines. "Echidna" = "like a hedgehog."

On to the Pinnacles. These are limestone pillars, somewhat like rough gravestones. Quite spectacular and especially nice in the evening sun, interesting light and shadows.

On way back, we tried to see the stromatolites, but didn't really know what we were looking for. Stromatolites are layered rocks formed by fossilization from huge bacterial colonies, which lived in layers, the top layer phototrophic and the lower layers feeding off their energy. They are known in various fossil deposits, but active colonies are rare. There are good examples in Baha California.

Kangaroo - seen on road in car lights.

Rain, lightning.

Back about 10.00 p.m. and got pizza.

Pilbara (pronounced, pill buh ruh). The region to the north is the richest source of iron ore in the world.

August 13, Tuesday. Walked the dog.





Then to Murdoch University, lecture at 12.30.

Lunch with Jeff Malpas, from New Zealand. He was for a time at University of New England. Arnold Thompson, University of Manchester, is now here.

Patsy Hallen, an American, is here, but in the Science and Technology Program. She has managed to arrange a position in ecofeminism every other year. It has been filled by Carolyn Merchant, then Karen Warren, and will be filled next by Val Plumwood, and Vandana Shiva. Hallen supervised the dissertation of Wawrick Fox. She works only half a year and is in the bush or whatever the second half. She teaches one class in environmental ethics, another in ecofeminism.

There are only four vet schools in Australia: Murdoch, Adelaide University, one in Melbourne, one in Sydney. There is a woman on the animal ethics committee at the University of Western Australia who thinks highly of Bernie Rollin.

After lunch, we walked on a boardwalk at a pond. Waterfowl. egrets, cormorants. Two rabbits on the Murdoch University campus.

Tour of Fremantle - a Victorian town.

Back at dusk. This area is called Sunset Coast. lorikeets in the trees along the coast at sunset. The tropical sun can set with a flash of green just at the setting. Green flash.

Rottnest Island, a "nest of rats," in Dutch, or, more accurately, quokkas, a small marsupial.

Kentucky fried chicken.

Ken Johnson, The Ausmap Atlas of Australia. Oakleigh, Victoria: Cambridge University Press, 1992. ISBN 0-521-42122-5

Australian bushfires are some of the worst in the world, as a threat to settled areas. The danger is greatest after vegetation has flourished and then fried out. They create their own localized fire storms. Good map of fire frequency (p. 77). The vastest part of the continent burns less often than once every twenty years.

Drought is common. At any time some part of the continent is experiencing drought. There were great droughts at the turn of the century, the 1940's, and in 1982-83.

Floods are common, owing to the extreme variability of the climate. The intense high rainfall floods the streams. Wetter or drier periods are common.

Development spreads into flood prone areas, shifts the runoff patterns and makes the floods worse.

Good rainfall map, p. 73. Low rainfall compared with other continents, and more variable than on other continents. Good climate maps, p. 71.

Steve Parish, Big Picture Book of Australian Wildlife. Fortitude Valley, Queensland. Steve Parish Publishing Pty, Ltd. ISBN 1 875932 038. Good pictures of echidna, platypus.

Discover Australia. Sydney: Reader's Digest, 1991, 1994. ISBN 0 86438 135 2. Later got it ILL at CSU, excellent for a survey of the types of landscapes.

August 14, Wednesday.

Rode to Freemantle on the train. Lovely Norfolk Island Pines in a town square on the ocean.

Toured Capt. James Cook's "Endeavour", 1768-1771, on board were Joseph Banks and Daniel Solander as naturalists.

Lecture at the University of Western Australia.

Dinner with Barry Meund, native Australian, philosophy of science.

Michael Levine, beard, American. Spent some time at the University of Virginia, Charlottesville, and had many temporary jobs. Has a book on Pantheism, with a chapter on whether city people are easily pantheist. He is not himself a pantheist.

Stewart Candlish, from the U.K.

Mauro Grün, graduate student from Brazil, Porto Alegre, met me there.

August 15, Thursday. Left 5.15 a.m. for a 6.20 a.m. flight to Ayers Rock (Uluru). More clouds across the continent than I might have expected.

10.30 a.m. to 2.00. Set up in hotels, lunch, shopping, visitor center. The village is called Yulara.

Drive to Uluru and cultural center.

Dingo seen at Mala Walk trailhead, got good pictures. He was looking around for some food.

Drove around Uluru. The rock is arkose sandstone. Ayers Rock was found in 1873 by the first European to see it, William Gosse, and named for Sir Henry Ayers, an official in South Australia. Uluru, the native name, means "giant pebble."

Drove to the Olgas (Kata Tjuta), with lovely clouds and lowering sunlight.

Desert oaks. Casuarinas, grow to 20 meters, a height unmatched by any other tree in the world in comparable arid conditions (Australia's Native Trees, p. 11). They were quite lovely on this drive.

On return, a dingo seen about halfway back, Nicely seen.

Drove to sunset viewing area, and saw another dingo there. Lovely sunset colors on the rock, the only really good sunset lighting effects we saw while there. Afterward, we drove around Uluru again at dusk. Another dingo (the fourth one!), seen on the way back, seen in car headlights.

Anangu - name for the local aboriginal people.

Uluru is a sacred site and the aboriginals prefer that you do not climb it, but give permission anyway. The signs here says that the aboriginals regret that you cover up the tracks left by Mala men. Their women weren't supposed to climb it either.

Quoted from sign:

Mala men travel to the top of Uluru. People who do "the climb" are walking over the tracks of the Mala. Anganga would prefer you not to climb Uluru.

Quoted from Mala Puta, nearby:





This cave is the pouch of the female hare-wallaby. It is very important spiritually. Do not enter or photograph it.

The Mala (hare wallabies) are one group of their ancestral beings, and ceremonies here recall the activities of the hare wallabies.

Kohen, James, Aboriginal Environmental Impacts. Sydney: University of New South Wales Press, 1995. ISBN 0 86840 301 6. Kohen is a biologist at Macquarrie University, Sydney.

Isaacs, Jennifer, Australian Dreaming: 40,000 Years of Aboriginal History. Sydney: Lansdown Publishing Co., 1992, 1996. ISBN 0 7254 0884 7. With a history of creation, including Uluru.

A few drops of rain fell halfway between Uluru and Kata Tjuta. The ranger said they had had a little rain this morning.

Return to hotel.

Anangu dancers seen briefly, overlooking into a hotel courtyard.

August 16, Friday

Up early and out. Drive around Uluru and walked the Mala Walk. Cloudy day, not much moving around.

Returned, picked up Jane, and left to drive to Alice Springs. Mt. Conner seen. Sometimes reasonably good vegetation, but sometimes red dirt with almost no vegetation - was this on cattle grazed areas?

Reached Eraldunda, at the junction of the Stuart Highway, which runs south to Adelaide. Emus in fenced compound there.

Yellow throated miner - at lunch, seen very close. Cold at lunch.

Reasonably good rain showers.

Wedge-tailed eagle. Two nicely seen.

Later, landscape got greener. More trees. Some Eucalyptus around Palmer River, a dry, wide water course.

Crossed Finke River, quite dry. These are just watercourses that flow when it rains. Rain increasing some.

Reached Alice Springs. I had arranged a nocturnal walk, but it was cancelled due to weather. Visited John Flynn's grave, founder of the Flying Doctors.

Drove west to West MacDonnell National Park, and looked for black-footed rock wallabies at Simpson's Gap, but not seen. Too rainy.

There is about 10" of rainfall per year here. Only 4" in the Simpson Desert to the east. There are cycads here, the only one in Australia, not seen now, but seen the next day, see below.

Took a brief walk at the Park entrance, with a 200 year old ghost gum (with quite white bark). Some rain continues. This messes up some plans, but at least we see rain in the desert.

The railroad here was called the Ghan, after Afghan, the camel drivers who preceded the railroad. It was quite an adventure to ride it.

Returned to the motel, a rather poor motel.

August 17, Saturday.

Off at 5.00 a.m. in soppy weather, but by 7.00 a.m. at Erldunda, sunrise and not a cloud in the sky.

Road trains - tractor trailer rigs, 50 meters long, with three trailers.

To the Luritja Road, and north toward King's Canyon. Drove under a cloud into an overcast again. Later, brighter. Passed by King's Canyon Campground, with camels, helicopters, and fenced kangaroos. Entered Watarrka National Park and to King's Canyon. Stopped at store and Jane locked the key in (!), but luckily did not close the door tightly, and I was able to push in hard and pop up the latch.

Took a walk into the canyon with Jane and then she returned to the car, while I did a 6 km loop alone on the rim. These are the George Gill ranges. Wedge-tailed eagle seen.

Saw both in the gorge and on the loop trail a number of cycads. Microzamia macdonnellia. Judd, *Plant Systematics*, p. 150. These are only in the MacDonald and Hartz Ranges. There were about 6 on the floor of the canyon, then 4-5 on the west side of the rim, then 15-20 in the Garden of Eden at the head of the canyon, then 3-4 on the east side on the return. Eyrean grasswren.

Nice hike. Lost City. Rounded domes that look somewhat like buildings or bee hives. The aboriginals called them the "native cats."

Drove back to Yulara. Quite lovely clouds, and some nice desert oaks. The Casuarinas were really notable, with a weeping effect, especially with the clouds behind them.

Three feral camels seen some while before the Ernst Giles road joins the Luritja Road.

Feral horses, donkeys, and camels are all a problem. There are 12,000 donkeys, 30,000 camels, and 75,000 horses feral in Australia. Feral goats are the most widespread, arriving with the First Fleet and spreading ever since. There are 350,000 of them, everywhere but in the rainforest and in the deserts.

Reached the campground "cabin" about 5.00 p.m.

This was 790 km of driving today, and then into Ayers Rock after that, which means over 800 km of driving (500 miles), most of it at 120 km/h = 75 mph. I drove 1600 km (= 1,000 miles) in three days. A disappointing sunset lighting at Uluru.

Parentia, a large lizard here, can reach 8 feet long.

Aboriginal fires here had been stopped, and in 1976, a lightning started fire burned 75% of the vegetation in the Park. Now there are fires set to reduce the fuel load.

Huge streams pour off the rock in a good rainstorm.

August 18. Sunday.

Up at 5.00 a.m. Set out on the climb of Uluru at 6.40, with dozens of others. Up the rock and soon onto the chain. A steady climb, and then reach more rounded dome. Then up and down over the rock and erosion features. It was so windy on top that I could hardly stand up. Sunrise as I was nearing the summit. I could see the shadow of the rock far out onto the plains. I turned around a little short of the summit in gale force winds.

Return was easier than I thought. Perhaps a thousand people were climbing it from all nations, lots of Japanese. 1.6 km one way.

Between 1931 and 1942 only 22 people were known to have climbed Uluru. In 1969, 23,000 people visited the area. In 1976, 65,000 people, and now there are almost 300,000 a year (Lonely Planet)

Plane to Sydney at 10.45. Flew over Uluru.

Flew over lots of red desert.

Flew over Lake Eyre, a huge dry lake. John Eyre made the first east-west crossing of Australia in 1841. It took five months and his companions died. Lake Eyre filled in the 70's, and again in 1989, only the third occasion in European memory. Donald Campbell tried to set the world land speed record here in the 1960's. When it fills it averages about 3 meters deep. In paleontological times there was a freshwater lake here three times as large. When it does fill, fish are carried downstream, and gulls and pelicans come and fish there. Two creatures are permanent: the salt lake louse (Halomniscus searlei) and the brine shrimp (Artemia salina). The louse stays alive in mud beneath the dried up crust; the shrimp survives as eggs with a tough skin.

There are frogs that go into suspended animation for years.

Reached Sydney. Gemini Hotel, in Randwick area. Took bus to the city, and went back to the waterfront and The Rocks. Supper in hotel.

Thunderstorm and lightning.

In 1788, when Europeans arrived, the aboriginal population is estimated at about 300,000, mostly on the eastern and southern coasts and in Tasmania. They spoke 300 languages and were in 500 - 1,000 tribes. They fought each other regularly. They had no written language. Many of them wore no clothes.

August 19, Monday. Flight back to the U.S. Up and out 7.00 a.m. to get some breakfast from a nearby Coles. Walked around a shopping center and spent the last \$ Aus 50 on books.

Flight to L.A. at 12.45. On the return, we spent August 19 twice, having missed July 2 entirely!

End of Australia trip.

Sept. 7-8, 1996. Backpacking to Miller Fork, alone. Not trying to push it, as I hadn't been packing all summer, due to Finland and Australia. Left Saturday, 9.00, on trail about 10.00. Reached the Signal Mountain turnoff about 11.00, and took an hour to descend the rather steep mile, reaching Miller Fork at 1.00. Ate lunch and set up camp. Nice day. Walked down the Miller Fork trail to discover that it hits a road not shown on the map about a mile and a half down. Returned, napped, supper. Baked cornbread, worked real well. Campfire.

Sunday, out about 7.15, and sun reached campsite while I was eating breakfast. Did the loop, taking the Donner Pass trail upstream, then climbing to where there is another trail back down to Miller Fork. Flushed a grouse about where I left the campsite area. Packed out. Steady climb and I didn't take it too fast. Lunched past the top where you get a good view of Long's Peak and Twin Sisters. Out about 2.00, and drove round to find the road I had discovered yesterday. The mountains over on the lower Miller Fork are honeycombed with cabins. Home about 4.00 p.m. Nice weather.

September 21-22, 1996. Backpack into Hague Creek, stayed at Desolation Campground. I had a permit for Mummy Pass Creek, but there was snow so I headed lower. Nice day, though there was often 2-3 inches of snow underfoot, with some areas cleared. I pitched camp in Flatiron, the furthest up, but a couple showed up with a permit, so I moved to Flatiron. Cooked cornbread in the backpacker oven. One bull elk in the meadow after supper, and some bugles heard off and on in the day. Not all that cold that night, and up the next morning to cook breakfast out in the sun below the campsite. Packed out without event. About 6 miles of hiking. Spent several hours browsing around the Never Summer Mountains trailhead at La Poudre Pass. Try the trail up Neota Creek from here.

October 27, 1996. Sunday. Hike loop from Upper Beaver Meadows and Beaver Mountain. Alone. Somewhat stormy forecast and overcast previous day, but I set out anyway and had blue sky all day. Drove to Upper Beaver Meadows but gate was locked, so walked in. Took Ute Trail, first dry underfoot and later with about an inch of snow. The Ute Trail goes up Windy Gulch, but before that the Beaver Mountain Loop cuts off. Good signs here. Horses seem to use this trail in summer,

but not all that messed up. Turned and headed up the loop. Lunched at a nice overlook rock with two magpies and a Stellar's jay anxious for some of my lunch. Spooked about six elk. Later, nice view of four coyotes, especially of two of them. Watched for perhaps half an hour until one, a young one, got so close I gave myself away, lest it get closer. Trail goes on around somewhat under Many Parks Curve; see map. Out about 2.00 p.m. 6.4 miles counting the walk in.

On way about, about 30 elk in Horseshoe Park, including four great bulls in my scope at once time.

November 8, 1996. Five mile run.

November 10, 1996. Nunn Creek Trail failed, then McIntyre Creek Trail from Browns Park Campground (Old Glendevey). Nice day. Coyote about Ted's place on the way up. More snow on the Nunn Creek Trail than I wanted to walk on. This is posted in lower end; see who owns it. Returned to car and explored Browns Park area. Hiked the lower end of the McIntyre Trail, which comes over to the campground and does not go out through the Old Glendevey route, which is now an outfitters lodge. Still more snow here than I thought. Lunched where the trail joins the main trail at the creek, with a good bridge. I could find enough space on a south facing slope there to have a good lunch clear of snow.

Drove around the loop road, via four corners. 33 antelope on a hillside. Napped at the Rawah trailhead on the way back, and found myself hustling to get off the Laramie River road by dark. The Laramie River road was often snowpacked, though lower down great stretches were quite clear. 7 bighorns in Poudre Canyon, one full curl ram, one half curl and the rest ewes.

November 17, 1996. Day in Everglades, as spinoff from Conference on Philosophies of the Environment and Technology, Florida Atlantic University. Loxahatchee National Wildlife Refuge, just east of Boca Raton and Delray Beach. Several of us were out briefly Saturday, and I returned all day Sunday. Hiked around the Marsh Trail doing birds, then the Visitor Center, and Cypress Boardwalk. Then went south to an entrance where there were airboat rides, took one, walked some there, and returned at the close of the day to the Visitor Center area.

Bald cyprus swamp. The vegetation is quite a contrast to the sawgrass of the glades. Cyprus trees covered with air plants. Understory guava, pond apple, wax myrtle, strangler fig (these are introduced). Notable air plants are cardinal wildpine, with red (cardinal) flower stalks, reflexed wildpine. Much Spanish moss, and ball moss. Worked the ferns on the Cyprus Boardwalk some: royal fern, swamp fern, strap fern, sword fern, leather fern, shield fern. The leather fern is especially spectacular, fronds to 16 feet long, the largest in North America. Sori on the underside are thick and give the appearance of brown suede leather.

Baton rouge, a lichen here, which makes the tree trunks reddish pink. Quite notable. Lots of duckweed. Birds: The commonest were coots and common moorhen, or common gallinule. Great egret, cattle egrets, snowy egrets (a few), great blue heron, white ibis, glossy ibis, mockingbird, loggerhead shrike. Half dozen osprey, seen well. Red shouldered hawk. Boat-tailed grackles. Black vultures. Mottled duck. Lots of anhinga, one seen with a good sized fish, trying to eat it. Pied bill grebe. Kingfisher. Tri-colored herons, somewhat like great blue, but have white underneath. Apple snail; the snail kite is here, but not seen, rare.

Everglades are nutrient poor, and the phosphorus runoff from sugar cane to the north brings nutrient flush that is detrimental, spreads cattails. Florida just defeated in the election a 1 cent a pound tax on sugar to help correct this problem.

Eight alligators seen during the day. One female with one young nearby, though they said she had had twenty, near the Visitor Center. Several from the airboat. Then one walking along a berm.

Red slider turtles. One big snapping turtle. One small muskrat

Air boat trip. Across the everglades. Stopped at "tree heads," clumps of a few trees or willows. Otherwise the vegetation is floating, though some things grow in the floating debris and various animals can walk on it.

The wind blew strong from the east for several days, unusual, they said, though it calmed for Sunday. Don Marietta's plate glass window was covered with a film of dust, though high in a condominium. This dust is blown across the Atlantic from the Sahel, desert in Western end of Sahara, in Mauritania.

end 1996.

## Trail Log 1997

February 22, 1997, Saturday. Raptor trip with Audubon south of town. About 15 eagles, mostly immature balds. About six adult balds. Two nice golden eagles in the sky. The highlight was five, then eight eagles all out in an open field, where they were gathered apparently because of a bit of prairie dog carcass that one of them had. Later, in cottonwood trees, there were two, one of which was eating a prairie dog. Several ferruginous hawks, although I was not all that clear about their identification. One coyote, seen moving across field. Sue Kenney, works for City of Fort Collins Open Space. Led by Bill Miller, president of Fort Collins Audubon Society. Richard Harkness had the new photographic guide to raptors.

March 16, 1997. Eagles at the plains reservoirs. Nice day. Coyote at the S. Platte River at Masters, watched him about a minute. Nice pair of pheasants, male and female, seen at length out on the road. Redtail hawk. Two male pheasants. White-crowned sparrows. At Riverside Reservoir: 1 adult bald on far shore, then eight bald eagles on a rounded sand island, two of which were adults. Then 2 adults on the ice, and 1 adult perched on far side. Total 12 here. Lake was open water, some ice in the bays. Lake was loaded with gulls, especially, more than I have ever seen there. Lots of scaup. Bufflehead. Mergansers. Four pelicans.

On return toward Empire Reservoir: rough-leg hawk soaring, nice white tail with black tip, tail is definitely longish. Mallards.

At Empire. 1 adult bald eagle on ice. 3 in trees across the bay, one an adult. Total 4 here. 4 snow geese. Pintails. Reheads. Shovelers. 10 Great Blue herons, in a roost across the bay. On leaving, a great horned owl sitting on her nest, just up the road from the rough parking lot. Seen nicely in scope.

Drive toward Orchard along the river. Kestrel. After Orchard, one adult bald eagle soaring over the river.

At Jackson Lake. One adult in the air leaving the lake area. One immature bald eagle perched and flew off as I drive on. Lunched at the far north boat ramp. 1 adult bald eagle perched further north. 1 adult flying low over the water. 1 immature flying over the water. 4 perched in distant tree, one an adult. Total at Jackson Lake 9.

At Prewitt. 1 single and then 3 bald eagles in trees across the lake on south side, 2 of these were adults. 12 great blue herons. All these lakes were loaded with ring-bill gulls, more by far than I have ever seen here. Total at Prewitt: 4. Total for the day 30 bald eagles. One of my better days, as I recall, for the totals. But none of them were as close up as I sometimes see them.

March 18, 97. Comet Hale-Bopp nicely visible in the evening sky. An evident comet with a nice tail. A student said you could see it right at the start of my Science and Religion class, so we all

went out to see it. I got binoculars from the car, and it is marvelous through binoculars.

March 19, 97. Got up at 4.30 a.m. to see the comet from the back porch through the spotting scope. Again, nicely visible. The comet nucleus is thought to be large as comets go, 10-40 kilometers wide, and unusually active about producing a tail. It is 120 million miles away, or 1.3 times the distance to the sun, though it is up out of the plane of orbit of the Earth around the sun. It is traveling at 75,000 miles per hour. It will return in 2,400 years!

The comet was discovered July 23, 1995 by professional astronomer Alan Hale and amateur Thomas Bopp in New Mexico and Arizona independently but within a few minutes of each other. It was then beyond Jupiter, but they could see it because it is very big. There is enough water in the nucleus to fill the Great Lakes. It has two tails, though I am unable to make the second one out, although it shows up in time photographs.

March 23, 1997. Sunday. Rocky Mountain National Park with Guocheng Liu, from Harbin China, and Stewart Sargent, as interpreter. Nice day. Half a dozen female bighorns in the canyon. Four coyotes in the park, two quite close up. About two hundred elk. Snowshoed briefly at Bear Lake. Then walked in to the Pool. Then drove to Many Parks Curve.

April 4-8, 1997. Trip to St. Andrews Presbyterian College, including Saturday morning field trip to a 2,000 acre woods north of Laurinburg, owned by Morgan family. Nice longleaf pine, but spring flora were nothing spectacular in piney woods. Much of this landscape was swamp originally, with some higher ground. Black gums in the swamp, and, here, in two mill ponds upwards of a hundred years old. Lovely azalea in town, quite spectacular. Dogwood in bloom but past prime.

Saturday, April 19, 1997. Out on the plains with Jennings Bunch and Jane, to Pawnee Buttes. Went by the Wellington ponds. Yellowheaded blackbirds. Scaup, especially. Rough-legged hawks. Not much going on at Crow Valley. Lunched at Pawnee Buttes. You can't drive up to the overlook at this season, due to nesting raptors. But you can hike down in between the buttes. Half a dozen antelope not far from the Buttes. Another half dozen on the way home.

April 26. Morning in woods at Fox Chapel, PA, while attending the American Philosophical Association at Pittsburgh. With Will and Sally Aiken. A bird walk with the Audubon society. White-throated sparrow. Double-breasted cormorant. Doves. Crow. Robins. Cowbirds. Towhees, a good many. Red shouldered hawk. Titmouse. Mallard. Pileated woodpecker, two flew by right over our heads, about as close as I have ever been to one. White-breasted nuthatch. Carolina wren. Cardinal. Redwing blackbird. Canada geese. Field sparrow, with strong call, like bouncing ball.

Lots of garlic mustard, Alliaria officinalis, very invasive, introduced from Europe, with garlic odor. I first found it at Holston, VA, 35 years ago! Lower down, in wetter woods, some spring flowers were nice, especially the finest colony of bloodroot (Sanguinaria canadensis) I recall seeing, still in excellent flower. Trilliums, only some in flower, most not yet. Toothwort, Dentaria. Spring beauty, Claytonia. Rue anemone, Anemonella thalictroides. And various others, reminiscent of my early years in the Appalachian woods. Lovely day.

May 11, 1997. Sunday. To Crow Valley, rather briefly, and hurried back for Mother's Day. Swainson's hawks, meadowlarks, lark bunting. Western kingbird. Wren, white-crowned sparrow, goldfinches (lots of them), blue-gray gnatcatcher (nice view), yellow rumped warbler, orange-crowned warbler, doves, robins, towhees (a good many), yellow warbler. One of the nicest views I have ever had, and marvelous for the yellow. Brown thrasher, half a dozen. Blue jay. Blackbirds, magpies. Canada geese, mallards. Half a dozen antelope enroute. Windy, and the birds were

much better in the lower, protected areas.

May 16, 1997. Drive to Estes Park, with Jane, to speak to National Council of Churches workshop for environmental enablers. Lovely drive. Coyote ran across road in front of car, a couple miles south of town on return. Nicely seen.

May 18, 1997. Crow Valley area, again. Still windy, but much warmer. Flicker, Canada goose, magpie, redwings, coyote in field, seen on way out. At the campground: Doves, meadowlarks, Western kingbirds, lots of them and noisy. Eastern kingbird. Brown thrasher. Orioles, maybe five seen, these were not here last week. Empidonax flycatcher. Wren. Robin, goldfinch. Hairy woodpecker. Killdeer. Horned lark. Yellow-rumped warbler. Blue jay. No thrushes, though others said they had seen them. 2 rabbits, small jackrabbits as nearly as I could make out. Definitely did not have cotton tails.

Drove around part-way on the bird loop. Great numbers of lark buntings and horned larks. Mountain plover, about 1/2 mile south of the stock tank at intersection of roads 96 (east-west) and 69 (north-south). Best view of one that I recall. Watched it half an hour. It eventually came quite close to the car. Runs in starts and stops, often with a head bob back and forth before it starts to run a bit. Three burrowing owls at the prairie dog town coming back, though no prairie dogs seen there.

## Yellowstone

May 25, 1997. Sunday. Left 6.00 a.m., drove up I-25. 25 antelope before the Wyoming line. 255 antelope in Wyoming through the day, mostly in two's and three's. They were easy to spot against the green. One wild turkey hen seen off roadside. Delightful day, lots of clouds, some blue in the West. Nice and green. Rain-drizzle mist at lunch at Sheridan.

Continued into Montana. 5 antelope. Total of 285 for the day. Few raptors seen.

Spent the night at Billings at Sleep Inn. Jogged around motel.

May 26, Monday. Drove to Bozeman to pick up Jennings. The Beartooth Mountains were spectacular, with snow, over green landscape. Driving up Paradise Valley there were 24 pelicans on the river.

Entered the Park. Only five bison, and 12 elk until just before Lamar Valley, then perhaps 200 elk and 60 bison in Lamar Valley. In later days, below, elk and bison are not tallied, but they were frequent. (This, despite the controversial kill of bison last winter for fear of brucellosis.) Antelope were frequently seen, but never in large numbers.

One trumpeter swan seen nicely near the road. There was a muskrat swimming near it, and the swan pecked at it twice.

Checked in at the Ranch. Then back out for the evening.

At a high overlook, one mile back west, one wolf seen nicely. It had crossed the road and was loping up the sagebrush hill behind. Watched it in the scope about five minutes.

One bear seen at great distance high across the valley. Others said they saw two, and said it was a counting pair, presumably a grizzly, but I could not have verified this. Then we drove down to Slough Creek and saw presumably the same bear, or its mate, briefly again, at much distance. However, later in the week we saw no such courting couple.

May 27, Tuesday. Up at 5.30, quick breakfast and out.

Saw grizzly and three cubs across the river on the bench, and moving right along at a trot, stopping from time to time. Watched her ten minutes, then moved the Jeep back to the ranch driveway and watched her half an hour. Marvelous, the first time I have clearly and indisputably seen a grizzly. There was a really conspicuous hump on her back, though none that evident on the cubs. She stood up on hind feet to look around several times. Sunshine came and went and there was good light. She eventually disappeared into the woods.

At Slough Creek: a carcass with ravens on it, and three eagles, immature balds. One unidentified coyote or possibly wolf at considerable distance on the hillside, never seen that well.

Drove up to Slough Creek campground. Barrow's Goldeneye ducks on the creek. Ring-necked ducks on a pond. Ground squirrels. Several hundred elk, 150 bison, one herd running fast.

Lunch. Class started 1.00 p.m. Gene Ball is instructor. He spends about half the year in Texas, includes some teaching at Elder Hostels, including some at Mo Ranch. Lecture on optics and ethics. Then out for a hike to Trout Lake. One bighorn ram on the skyline. We hiked up to the lake, about a half mile up, hoping to see an osprey, but not found. Lomatium, Biscuit-root.

Returned to van. Then we watched three wolves, a dark one and two tan ones. They worked their way down from Soda Butte, and we moved the van three or four times to keep up with them. Nicely seen through the scopes.

A prairie falcon (with "dirty armpits") was harassing a golden eagle, as well as were some ravens.

We grabbed some snacks at the ranch and were back out at 7.00 p.m. We watched the same wolves some more, now opposite to Lamar Ranch. They chased into a herd of 60-70 elk and split the herd into half, but caught none. They eventually disappeared into the trees. These wolves are said to be 38M, 40F, and 42F, the Druid Peak Pack, introduced in 1996. The pack contains 5 wolves.

Coyote seen in the meadow further down. Grizzly sow and three cubs seen at great distance. Another sow and two cubs seen also at a distance. These would not have been recognizably grizzlies, except that we saw the same bears closer on other occasions.

Total so far 7 different grizzlies, 4 wolves.

May 28, Wednesday. Up at 4.15, off at 5.30 a.m. In Slough Creek area, an elk calf and mother seen in distance but seen well. The cows come into the sagebrush to have their calves, where the calf is hidden and lies alone most of the day. The mother comes to nurse it now and again. The calves are scentless, though the bears learn to roam the sagebrush searching for calves at this time of year. In three weeks or so, the calves will be up and running.

No bears, no wolves.

To Tower Junction, then to Tower, looking for black bears. Found none.

We looked at an osprey on a nest in a spectacular setting, high on a pinnacle. The road runs above it all and you can look down into the nest. Two eggs, when she got up once.

Harlequin duck on island in Yellowstone River. These are considered rare, and I do not recall seeing one before.

80% of the park is forested, and 80% of that is lodgepole pine.

Lunch. Left at 2.15 for hike in the Tower vicinity. Uphill and cross country scramble. Mountain bluebird. Lots of Dodecatheon. Some Clematis, Mertensia, Forget-me-nots.

Good claw marks on aspen. Two sandhill cranes.

Flushed a great grey owl, rare. This is the southern limit of its range. Saw it in flight twice. No horns. The largest owl by size. In a way this is more of a find than grizzly bears or wolves.

Back on the road, there was a black bear and cub of the year along the roadside. We watched her an hour; the cub was quite active, scrambling up trees now and again, walking on logs, generally curious.

Pulled in the Yellowstone Picnic area, near the river, for rest stop. Bighorns on the hill in the distance.

A little later, bighorns on the skyline, a splendid aesthetic experience.

Back to the ranch and quick supper.

Saw grizzly and two cubs seen in the distance from the parking lot, across Lamar Valley.

Drove up toward Soda Butte, half a mile, spotted three wolves in the distance, seen chasing an elk. Others said they saw four; I only saw three, two greys one black, presumably the Druid Pack seen before. Others claimed to see a bear in the distance; I did not.

We drove down Lamar Valley. Saw a cinnamon colored, subadult grizzly climbing the sagebrush hillside. The hump was not all that obvious.

Grizzlies have a more rounded face, appear larger at the front end. Black bears have a thinner face, longer ears, and appear to be higher in the rear end.

Rain and dark.

May 29, Thursday. Somewhat rainy. Up at 4.15 and out. Grizzly and cub across the valley. Drove up Lamar Valley, and saw a grizzly on the hill. You could see the hump on it, and it had a collar on. Vesper sparrow.

Then drove down the valley. One wolf climbed over the ridge, presumably but I saw it only at a distance. We then spent some time trying to catch sight of it again from another location. En route, there were two coyotes crossing the road, one carrying a skull, one carrying a larger bone, like a femur.

Then to Tower. The black bear and cub were spotted from the store parking lot high on the hill. Then we went into the campground and watched her extensively, down in a valley below the campground.

Redtail hawk, on rock over pond.

Back to the ranch, ate dinner.

Two redtails in dead tree.

After lunch, Chuck Neal, Cody, Wyoming, on backyard habitat.

Drove to Cooke City for milk shake.  
on return, one moose  
coyote with radio collar

watched wolf video  
supper.

Drove down toward Tower.  
two coyotes across a pond, nicely seen.  
drove the road from Tower Junction toward Mammoth  
moose, chewing the cud beside the road.

We pulled up to a viewpoint looking east. Look for wolves where there are elk bunched up or alarmed. Watch for ravens on a carcass.

Two coyotes about where there were two in the morning carrying bones.

Back to Slough Creek. Grizzly sow and two cubs on distant skyline toward dark, rather nice though at much distance.

May 30, Friday.

Out at 5.30 and down the road. There was a herd of elk hesitating to cross the river, which was quite swollen. We watched them a while, and saw two cross. One was swept quite a ways downstream, and eventually got across. Two bald eagles.

There was a report of a grizzly back across from the ranch. We returned and watched a sow grizzly and two cubs on a carcass, across the river, but not all that far off as these sightings go. Quite nice. They were on a carcass. Two coyotes were trying to get in, also two bald eagles. One of the better sightings on the trip. The creek across from the ranch is Amethyst Creek.

Steve and Marylyn French are bear experts. Yellowstone Science has an article on bear attacks. Kerry Gunther and Hopi Hoekstra, "Bear-Inflicted Injuries in Yellowstone, 1970-1994," Yellowstone Science vol. 4, no. 1, Winter 1996 (on hand).

Black bears keep cubs one year, and breed the second year. Grizzly bears keep their cubs two years and breed the third year. They breed in May or June and implantation is delayed.

We drove up toward Soda Butte on report of a wolf kill, but were unable to find it. Coyote running in the distance. Bighorn ram at waterfall, quite a nice scene.

Back to the ranch. The coyote was at the den site, but no pups seen. Bob Landis is doing a coyote study.

4 bighorns in the distance.

Rick McIntyre, a sort of combination ranger-volunteer, who has a book on the wolves. Wrote A Society of Wolves (Stillwater, MN: Voyager Press, 1993, revised edition 1996).

Drove to Tower. Those on the other side of the van glimpsed the sow black bear we had seen before, but I didn't see it. From Tower drove toward Mammoth. Sandhill crane on nest at pond west of Floating Lake. Sora rail on the edge of the pond. Yellow-headed blackbird.

Hamburger at Helen's in Gardiner.

One black bear in burned forest on return, nicely seen. A lone adult.

Cinnamon yearling cub at the bridge on an old carcass, with a patch of hair out of its rump. This is one of "Rosie's cubs."

Different grizzlies seen:

Sow and three cubs of the year, Lamar ranch area  
Sow and two cubs of the year, Lamar ranch area  
Sow and two cubs of the year, Slough creek area  
Subadult on hillside up road toward Soda Butte  
Subadult on hillside down road  
12 grizzly bears, to this point

Black bears seen:

sow and cub, seen at length, Tower area  
black bear across from ranch, in distance one evening  
black bear in burned forest on return  
yearling cinnamon cub at bridge on old carcass

5 black bears, to this point

List of birds seen:

Barrow's goldeneye  
Yellow-rumped warbler  
prairie falcon  
golden eagle  
bald eagle  
mountain bluebird  
redtail hawk  
lesser scaup  
dipper  
harlequin  
chipping sparrow  
green-winged teal  
gadwall

mallard  
cinnamon teal  
osprey  
white throated swift  
violet green swallow  
widgeon  
bufflehead  
coot  
shoveler  
ruby-crowned kinglet  
sandhill crane  
house wren  
black-eyed junco  
savannah sparrow  
vesper sparrow  
great grey owl  
Williamson's sapsucker  
hairy woodpecker  
Townsend's solitaire  
trumpeter swans  
white pelican  
western meadowlark  
common merganser  
Brewer's blackbird  
Lincoln sparrow  
redwing blackbird  
willow flycatcher  
least flycatcher  
great blue heron  
robin  
starling  
English sparrow  
barn swallow  
kestrel  
raven  
Clark's nutcracker  
glue grouse  
Stellar's jay  
Canada goose  
ruddy duck  
magpie  
white-breasted nuthatch  
common snipe - seen the last evening flying over water  
American goldfinch  
flicker  
gray jay  
western kingbird  
eastern kingbird  
tree swallow  
sora rail - seen walking where the sandhill crane was nesting  
savannah sparrow

crows are unusual inside Yellowstone

end of seminar.

Showered. Drove down to Slough Creek to get campsite. Looked around on way back. Coyote howling nicely, where the elk hid the calf. Back to Lamar Valley. Sow and yearling cubs in great distance on mountain across the valley. Black bear on bench level, opposite and across the river.

Return to ranch. Badger digging in the yard. Seen nicely, digging furiously here and there. Watched it 40 minutes.

Back out with Gene Ball in van. Snipe seen flying below along water, nice but brief.

May 31, Saturday.

Sow with two cubs of the year at Slough Creek by the river, in sage in the distance on old carcass. Cubs of the year can run under her belly. Cubs of the year are the size of her head. They are smaller than a coyote. We watched her on the hillside for an hour, wandering around, for a time on an old carcass.

Pitched camp at Slough Creek, then returned and packed up at Buffalo ranch. Back down to Slough Creek, the sow and two cubs still there.

Drove to Mammoth Hot Springs. Lunch there. Brief drive up to Mammoth Terrace area. Drove to Bozeman. Checked Jennings in his hotel (Sleep Inn), and I put him to doing the wash while I shopped. Took him to motel and drove back to Yellowstone. Ate supper at Slough Creek campground. Sow and two cubs seen again briefly near dark. Rainy now and again. Quiet night.

June 1, Sunday. Up at 6.15. Sow and two cubs of the year seen again in the distance on the hillside. There was another sow and two cubs down the Slough (west), seen only briefly, too far to make out much. But this would be grizzlies number 16, 17, and 18.

Drove back up to Lamar Valley. There was a limping sow and three cubs in the sagebrush hillside north of the road. Watched her quite a while. Nicely seen through the scope, the second or third best viewing I have had. The cubs were quite playful. She had a decided limp. She didn't seem to put her front right paw down on the ground at all. Others said she had been limping two days. Watched them as they climbed the ridge and went over it. Very nice silhouetted on the skyline, the cubs still playing, and she limping. A bit of pathos and some grandeur.

This would be grizzlies 19, 20, 21, 22.

Drove up toward Soda Butte. Returned to campground and packed up. Ate breakfast. Drove to Mammoth Hot Springs. Called Giles. Drove to Norris. Lunch.

Between Norris and Canyon, there was a cinnamon black bear eating an elk calf carcass in the timber. Watched it half an hour (pix). I could have thought it a grizzly cub, though there was not much hump. The way it postured suggested some. But there was no dishd face.

On to Canyon. Bought gas. On to Fishing Bridge. Lots of snow drifts through here, 3-4 feet high. Stopped by Visitor Center. To Bridge Bay and set up camp. Called Jane, this is our 41st wedding anniversary.

Back out to look around. There was a subadult grizzly female, first digging at a tree across a meadow, then out in the meadow. The lighter girth band was evident. Watched her an hour, the closest about 50 yards. This was the closest I was to a grizzly on the trip, and I heard no more reports of her in the stay there.

This would be grizzly no. 23.

Drove up toward Mud Volcano and ate supper in picnic area.

If you can see the claws, grizzlies have much longer claws.

June 2, Monday. Up at 5.45 and out by 6.15. This was a cold night, I should have slept in long johns. Good frost on the windshield. This is 7,700 feet high.

Drove to Hayden Valley. There was heavy ground fog in the valley, and you couldn't see a thing. Mergansers. Pelicans. Scaup.

Returned to Fishing Bridge, and drove out Pelican Valley way. Quite clear and sunny here. On return, there was a black bear in the timber. I first saw it in the rear view mirror! -- and backed up to find it in the woods. Watched it ten minutes, alone. No one else happened along. This one I spotted alone and watched alone.

Returned to Fishing Bridge. Two splendid pelicans flew over the bridge low just as I crossed it.

Shaved in the store and back to campground. Jogged around campground. Shower, and lunch at shower parking lot. Visitor center.

Grizzlies can be black. The hair is often silver tipped, hence, partially, the name.

The hump is muscle, used in frequent digging.

Tundra swans (formerly whistling swans) migrate through here spring and fall and look much like trumpeter swans.

Black bears' ears stick out overhead in profile. Grizzly's ears may not. They are smaller and more lost in the profile. In face view, you can see the ears sticking out, but they are still shorter than black bears.

Posturing can make a black bear appear to have a hump.

Large black bears can appear at time to have a concave facial profile.

Grizzly claws generally show in the tracks. Black bear claws generally do not. Unlike humans, the big toe is on the outside.

Drove through Hayden Valley. Elk and bison. Supper at north end of valley in picnic area by the river. On return coyote across the river. Drove back out the East Entrance Road where I saw the bear this morning. Nothing. Dark about 9.00 p.m.

The River of No Return is from the salmon, the spawning salmon do not return.

June 3, Tuesday. Up at 5.45. Cold night, even more frost than the night before. Scouted as before. Elk. Snipe calling. Drive out East Entrance Road, then up Hayden Valley, which was clear

as a bell in contrast to yesterday. 1,000 cliff swallows flying in and out under the bridge at Elk Antler Creek.

Spent most of the day in a picnic area near Mud Volcano reading Bruce Anthony's thesis, University of Newcastle, Australia. Coyote walked by the car 20 feet away, and prowled the picnic area. Profuse spring beauties (Claytonia), often a virtual carpet under the lodgepole pine. Grizzly bears eat the roots of these.

Back to Fishing Bridge, and keyboarded the trip in the Visitor Center Parking lot. There was a moose walking around in the junction area. Supper back at the picnic area. Scouting till dark. Moose again. Western grebe. In the night, the Milky Way was quite visible.

June 4, Wednesday. Up at 5.45. Mercifully, the mildest night of the three by far, since I had to pack up. Off at 7.00 a.m. Showered, then drove to Canyon. Gas. Canyon to Norris, one moose in the timber.

Norris to Mammoth, then Gardiner. There was a bighorn ram right at the streamside (pix), having difficulty, apparently getting up the hill and not wanting to fall into the swollen river.

Groceries in Gardiner. To Slough Creek and pitched camp and ate lunch, about 12.30. Spent the afternoon finishing Anthony's thesis, and keyboarded it at Yellowstone Picnic area. Supper there.

Then scouting. 50-60 people at Slough Creek seeing nothing, not yet anyway. But there had been a wolf kill in the area a day or two before.

Up to the lookout one mile west of Buffalo Ranch. Sow and two cubs of the year at great distance in the snowline across the valley. Watched her half an hour.

Drove on up toward Soda Butte. One mile beyond Soda Butte, saw one grizzly in the woods, in and out on a sage brush hill. Seen quite nicely for about a minute, after waiting there some time because others said they had seen it. Well developed hump, and one of the more satisfying viewings on the trip. About 9.00 but still surprisingly good light. This would be grizzly no. 24.

Back to camp. All the riverside campsites are flooded, the water up to the seats on the picnic benches.

June 5, Thursday.

Up at 5.45, off at 6.00. Sow and two cubs of the year at Slough Creek, at great distance, on a carcass (presumably the one reported to be a wolf kill a couple days before).

One black wolf seen above the bear. Others said they had earlier seen two. I saw it running, and thought it had laid down beyond a fallen aspen, and, though I watched it 40 minutes, it did not move. Since the black spot was still there that evening, it must not have been the wolf. But I did see it running.

Two bald eagles, adults perched in a dead tree.

Drove to the lookout west of the ranch. Sow and two cubs of the year in the distance across the valley. The cubs were quite playful on the snow, and moved across it with surprising speed.

There were elk trying to cross the river at the Lamar Picnic area, though none did it.

Drove to Cooke City. The road climbs and you enter Gallatin National Forest. The campgrounds here are still snowed in. Drove over Cooke Pass and the road crosses into Wyoming and Shoshone National Forest. Drops to lower elevation in Clark's Fork Valley. Marmots.

At and beyond Crazy Creek, Pilot Peak (11,708 ft) and Index Peak are quite striking. Pilot is like the Matterhorn.

Passed the Chief Joseph Highway turnoff. This is the road to Cody and is now kept open all year. Chief Joseph fled this way, and was chased by the military. There are various accounts of how Dead Indian Pass got its name.

Drove on up the Beartooth Highway. Claytonias in profusion. Lithophragma. Fritillaria putica, Yellow fritillary. Yellowbell.

The road climbs with more snow. Beartooth Lake is still mostly frozen, a big lake. Beyond is 3-4 feet of snowpack. Reach Top of the World, a store, but this is only subalpine, and the road climbs beyond. Visible from here, Beartooth Butte, with two "teeth" on one side, but the real "Beartooth" is at the pass. Clay Butte is also here. There is a fossil deposit in Beartooth Butte in which a Princeton team found Devonian fossils with the notochord in them.

Reach Chain Lakes, and snowmobilers on the frozen lakes and countryside. There are large rolling and flat areas here; now fully in the alpine. Lunch.

5-6 feet of snowpack in areas, though other slopes were clear.

Reach West Summit of Beartooth Pass, lots of tundra expanse. This is certainly the equal of Trail Ridge Road in Rocky Mountain National Park. The West Summit is the higher, something about 11,000 ft.

Some miles further east is the East Summit. They were shooting a TV commercial on how to sell an refrigerator to an Eskimo, and had built a styrofoam igloo and had a dogsled team and all.

Beyond, the "Beartooth" is quite striking, a gigantic tooth, spire seen between other mountains. (postcard, copied as slide).

Returned. Marvelous clouds, as well as mountain scenery, including a gathering storm after a splendid day.

Cooked dinner (noodles and tuna) at Warm Creek Picnic Ground back inside the park, with the last of a long-lasting jar of Ranch Salad dressing, on the last of a stir-fry makings used for a salad.

Coyote in timber below Icebox Canyon.

Rain lower down. Phoned Jane from the ranch, and back to the campground and keyboarded the trip in the rain.

June 6, Friday.

Up at 5.15 and out. Sow and two cubs of the year at Slough Creek, watched for 20 minutes.

I went up on a higher hill to try to see a carcass in the water, which wolves had killed a few days before, but couldn't see it.

Drove up to the lookout west of the ranch. Sow and two cubs there, across the valley. She and the cubs went up a long steep snowfield in ten seconds. Surprisingly agile.

Others had seen and heard the wolves howling further up, but no sign of them by the time I got there.

Back to camp and spent the morning reading Northcott's The Environment and Christian Ethics. Packed up from Slough Creek. A moose wandered through camp. Spent the afternoon at Yellowstone Picnic area reading Northcott.

At 4.00 p.m., went to Yellowstone Institute and set up for the seminar. My roommate is Jeff Norberg, 234 Barclay, Lolo, Mt 59847. 307/273-0980. He teaches science in a Christian high school.

Grizzly bears feed on insects mating in hordes on cliffs high in the Mission Mountains (near the Bob Marshalls) in late July, early August, a rather brief period. The area, or part of it, may be closed during this time. It is about a day's hike in to see them and back.

Few of the roadside bears, in the old days, were grizzlies.

June 7, Saturday.

Up at 4.15, off at 5.00 a.m. Drove up to Soda Butte. Saw one black bear, first seen at a distance, and then drove the van closer, and saw it rather well in the scope, though briefly (10-15 seconds).

Drove down to Slough Creek. Lots of people there. Someone spotted an alleged wolf in the distance, and the whole group watched it and then two others for 40 minutes. They came closer in, though always at much distance. They were all tan, and the eventual conclusion was that they were coyotes. There were pups in a den lower down.

Returned to the class.

Lecture by Paul Schullery, on Yellowstone bears through history.

Lecture by Dan Reinhart on grizzly bear habitat.

Lunch. From the institute, in the distance, an elk calf seen nursing.

Badger out near the sled.

Afternoon: Three lectures by Kerry Gunther.

A coyote came by the ranch house back yard, and went down the creek.

Supper, and then I went out alone. Saw a wolf nicely up Soda Butte way, on the level bench across the river. This was the best, or second best view of the trip, though the one the first night was also good. The wolf was a dark color and had a collar on. I watched it defecate at one point. Tried to see it further down at the horse trailer pull out, though no luck. Others said they saw it cross the river at the horse ford without difficulty.

June 8, Sunday. All day field trip. Drove over the Mount Washburn highway. Whitebark pine has a square-topped look, rather noticeable once you are alerted to it. Up close it is much like limber pine.

Drove to Canyon. Walk in to bear den.

Walk in to the old Otter Creek dump site. Climbed the hill a bit to where a photographer was killed by grizzly bears. He was alone and nobody knows the story. He was not found until several days later.

Lunch at picnic area near the Mud Volcano, where I had been several times before. Coyote in the picnic area.

Drove to Fishing Bridge. Hike up Elephant Back Trail. Lehardy Rapids, watched spawning cut-throat trout.

Supper at Canyon. Drive back. At Slough Creek, we watched the sow and two cubs at considerable distance. A rainy night.

Sue Consolo Murphy's husband does research on mountain lions, and says they kill elk regularly in the park. Watch for them in the canyon narrows.

Herrero, Stephen, Bear Attacks: Their Causes and Avoidance. New York: Lyons and Burford Publishers, 1985. (31 W. 21st St., New York, NY 10010).

June 9, Monday. Up at 4.15. Out at 5.00 on soggy, wet morning. Drove up Mt. Washburn, but too foggy to see. Drove to Slough Creek, raining.

Lecture at 9.00 by Mark Haroldson, a bear trapper. Bear trapping. An excellent talk. He and his team trap about 40 bears a year, for research, and also problem bears.

There has only been one daytime fatality in the lower 48 states (the photographer). Playing dead seems to work.

Night-time tent situations are different. There you probably should fight.

Black bears go back 4 million years and have a good deal of genetic variability. Grizzlies go back only about 1.5 million years and have little genetic variability. The black bears in the park may have more genetic variability than grizzly/brown bears all over the world.

Lecture: John Varley, the future of Yellowstone grizzlies.

12.00. seminar end.

Drove out over Chief Joseph Highway. Waters are high, and above Cooke City at one place the road was covered with water, the left wheels reasonably dry, the other side up to my hubcaps. The Chief Joseph Highway is quite scenic, in the Clark's Fork Canyon. It drops and the road goes over Sunlight Creek/Canyon, over a spectacular bridge. Then climb to Dead Indian Pass, 8,000 feet, which was soggy and rainy. Then drop to the plains. Stayed the night with Bruce and Margy Jones, Cody, Wyoming.

June 12, Tuesday.

Drove home, in and out of rain, sometimes scenic clouds. Arrived about 3.30 p.m. end of Yellowstone trip

Siberia and Lake Baikal  
June 15-29, 1997

June 15, Sunday. Left Fort Collins 5.45 a.m., Denver to San Francisco, arrive 8.35. Met the main trip leader here, Victor Kuzevanov, Director of the Botanic Garden of Irkutsk State University, Irkutsk. Met Margaret Betchart. She is President of the International Association of Ecotourism.

Left San Francisco on Aeroflot 12.30. The plane is an IL-62, Ilyushin-62. Landed in Anchorage, Alaska, about 5.00 p.m. Flew in over Prince William Sound and Kenai Mountains, some striking snow covered mountains.

Flight to Khabarovsk, over Bering Strait, sometimes water with ice in it, though the flight is much over northeast Russia, all in daylight, arriving about 8.00 p.m. local time, on Monday, June 16 (therefore skipping a day because flying across the dateline).

June 16, Monday. Checked into hotel, an Intourist hotel. Room mate is Mort Glass, Belmont, MA. Atmospheric sciences, retired. Met the assistant tour leader here, Aleksey Golovko, astrophysics, especially solar prominences, observed from an observatory on the shores of Lake Baikal (visited later).

The city is rather typically Russian, full of doms, and rather rundown and weedy looking. You don't get the impression of being in the Orient, either from the architecture or the people. There is lots of cotton in the air from cottonwood trees. Warmer and more humid than I expected. There are 614,000 people in Khabarovsk. 86% are Russians. There are only 3 churches; formerly there were over 30.

Stretches of the city have the depressing gray blocks of huge apartment houses that go on forever.

Khabarovsk was named for Khavarov, a brutal Russian explorer.

Salaries are \$ 150-250 per month. A typical academic salary is, in equivalent \$ 150 per month, or, \$ 200 for better paid positions.

\$ 1 = 5,780 rubles.

In 1993, when I was in Moscow, the exchange was \$ 1 = 1,200 rubles.

Military service is compulsory for young men, and many seek to avoid it. In the army, life is difficult. They may not even have enough to eat.

General notes on Siberia:

Siberia means "sleeping land." You can put all of the U.S. into Siberia without touching its boundaries, and fit all of Europe, except Russia, in after that, with room to spare. (Lonely Planet

Guide, p. 695).

The Russians pushed into Siberia something like the European-Americans pushed across North America, displacing the natives.

Many Russians were exiled there, some fled there; many died in the mines and work camps, which were virtual prisons. But some, freed, found freedom in the open spaces.

Fyodor Dostoevsky, Leon Trotsky, Joseph Stalin, and Lenin were exiles here.

Siberia has 53,000 rivers and more than a million lakes. (Lonely Planet, p. 701).

The main rivers of Siberia are:

Ob

Yenisea

Lena

Amur

nicely shown in Classroom Atlas, pp. 70-71.

Though arable land is in short supply, Siberia is rich in resources--oil, gas, coal, diamonds, bauxite, gold, fish, timber, in a hostile environment. But to whom will the benefits go? The Russians, the locals, foreign investors. Siberia is still a frontier.

Siberia has the perennial problem of colonies. When they export the raw logs, or ores, or whatever, since a raw log represents only a fraction of the value of the finished products that industry will produce from them, they are exporting the jobs they need to lift themselves out of poverty. The Japanese and the South Koreans, or the Americans, who import the logs wish, of course, to retain those more skilled and productive manufacturing jobs for themselves, since they are the secret of their wealth.

There is a mad rush to cash in on Russian's natural resources at a time when their collapsed economy makes them especially vulnerable to exploitation, whether by the mushrooming transnational corporations, or (as for so many centuries before) by Moscow. They are naive about capitalism and the need to regulate it.

Taiga - dense, swampy forests of birch, pine, spruce, and larch. Siberia is the world's largest forest, and 25% of the world's wood reserves.

Northern Eurasia contains the largest intact tracts of wilderness on Earth, boreal forests (taigas), bogs, tundra, and mountains. About one third of the area is boreal coniferous forests, the largest forest in the world. Russia has 54% of the world's coniferous forests.

Northern Eurasia has over 22,000 species of vascular plants, 1,100 species of bryophytes, almost 200 species of amphibians and reptiles, 765 species of birds, and 360 species of mammals. About 10% of animal species are endangered or threatened; many are endemic to Russia.

Russia has an 80-year old system of strict scientific nature reserves (Zapovedniki), in addition to National Parks and other state protected natural areas. The area so protected is larger than the U.S. National Park system, and, they claim, protects over two-thirds of the rare and endangered species in Russia, as well as many undisturbed units of all major types of regional ecosystems.

above from blurbs on Russian Conservation News.

Vladivostock is closer to San Francisco than it is to Moscow. Lonely Planet, p. 709. Vladivostock was closed to foreigners until 1992.

Crossing Siberia and the Russian Far East is about the same distance as New York to Berlin. Lonely Planet Guide, p. 732.

June 17, Tuesday.

Tuesday morning. Tour around the city.

Walk in the park alongside the Amur River.

The Amur River is 4,440 km. long, forms in Mongolia, and flows east to discharge into the Pacific. The Amur is navigable only 6 months a year and is rather shallow. It ices up sometime in November and thaws in early May. It is a trading route, a source of fish, and a drain, full of pollutants from all the cities and towns along the way.

Manchu Mountains in the distance, across the river, and beyond is China.

Visited War Memorial, somewhat like the Viet Nam Memorial in Washington, with 30,000 names, which was 15% of the population in Khabarovsk in World War II (the Great Patriotic War).

Education beyond high school is difficult. One has to pay for this now and most cannot afford it.

Also, they increasingly have to pay for health care.

We visited a market place, bustling and typical.

Half the cars have the drive on the right-hand side, as many are used cars from Japan.

There is snow here from mid-October to the end of April.

KWAS - a drink, sold from big cart-cans.

We got on the train at 2.45. The train is electric powered. The name of the train is the Rossia (Russia).

There were dire warnings from the Intourist Guide, Svetlana, about not missing the train when you get off for a few minutes at stops along the way. Also not to get locked in the toilet, which are locked about five minutes before arrival in each station. You can watch the waste just flush down onto the tracks below.

My compartment is about 5 x 6, with two bunk-seats, a folding table and a 3" x 5" TV, which never had much on it. The wall is simulated panel, rather nice. There are toilets at each end of the car, although the only one we use is at one end. There is a cold water basin there, difficult to work.

This is the only car with two-bunk compartments. The other cars, about 15 of them, have 4 bunks and are quite crowded and full of tobacco smoke.

The Trans-Siberian railway is the longest train journey in the world (across eight time zones). The locals often live by whatever time they choose. The time in the train stations in the larger cities may be in Moscow time.

Moscow to Vladivostok is 9,289 km. = 5,805 miles.

$5,805/25,000 = 24\%$ , or about 1/4 of the way around the globe.

Khabarovsk is 8,532 km. from Moscow.

Irkutsk 5,191 km. from Moscow.

3,340 km. - Khabarovsk to Moscow = 2,087 miles.

100 years ago the first train arrived from Vladivostok, 1897-1997, which is 500 miles away.

Ours is the best part of the Trans-Siberian, more scenic than others. There will be lots of wildflowers.

The train went through a tunnel under the Amur River, rather than over the bridge. Then we went through flat country, with lots of grassy-looking Carex, and white birch, mostly. The birch are about 6" diameter, not larger trees.

Virtually all forests within 10 km. of the Trans-Siberian railway have been logged. Russian Far East, p. 19.

The wildflowers are quite nice. There is especially a yellow one, day-lily, widespread in the fields. Spectacular displays of this.

Wild iris

Willows.

Mostly deciduous trees through here, fewer conifers than I expected, though conifers were to come later.

We reached Birobidzhan, 87,600 people, a town, little developed, the capital of the so-called Jewish Autonomous Republic. The name on the train station is in Hebrew letters.

Reached Bira and got out a few minutes. The name on the train station is in both Russian and Hebrew letters.

Dinner in the dining car was a greasy diced sausage and brown bread, then chicken, cold peas, potatoes. Victor Kuzevanov provided champagne, that virtually exploded when opened, because it was hot.

In the dining car, there never seemed to be more than two knives for four persons.

Mountains now seen in distance, then more relief closer up on the landscape.

Generally very third-world looking. Ramshackle wood houses.

Changed time zones.

Reached Arkhara, bleak and about dark (9.30 p.m here). There were a few women selling food at the train station. About a 20 minute stop. We didn't see an automobile in the whole town (nor, except for Tygda, next morning, did I see one in the whole main part of this trip, though there were some toward Chita, more later.) More likely there would be an old and odd-looking truck, often with a leftover from the military look. Looking something like a cross between an old military truck and a chicken coop. Maybe also an abandoned cab or bed of a truck.

Reached Magdagachi, a big railroad yard, and some apartment buildings. Ten minute stop, but we couldn't get off. There are no paved roads to be seen.

June 18, Wednesday.

Waked at 5.00, with a stop at Tygda, another bleak village. Some 5-6 automobiles seen here.

There is some adventure getting your face washed in the toilet. There is a hot and cold tap, but only cold water. You have to hold up a plunger under the spigot while you get a trickle of cold water. You can't drink this water. To brush your teeth, you get boiled water from the samovar at the other end of the car.

Although we are only 50 miles from the Chinese border, there is no Oriental look at all to the towns, either the architecture or people, as before in Khabarovsk. The Russians built the railroad and dumped the settlers along it. More wooden houses, with big piles of stove wood outside.

Breakfast.

Stopped at a village ? and got out about ten minutes.

Notes from a lecture in the dining car:

This is permafrost country. It may not be so on the hills but in the valleys, and perhaps on northern exposures and not southern exposures. The permafrost is in patches, often small pieces, 10 sq. meters to 40 sq. meters.

Betula verrucosa, Populus tremuloides, Pinus sylvestris.

Population density in Siberia is quite low, mostly along the railroad, or the rivers, lakes, roads.

Only about 100 frost free days here.

The richest land on Earth per capita is Australia, though it is quite short of water.

Sign noted, 7,255 km. to Moscow.

Bhurats, a group of Oriental Mongolian tribes.

There is a saying, "There is a dead body under each railroad tie."

Alcoholism is a problem with the locals. The life expectancy is 53 years for men, for women 71.

There are weights on the power poles, with a pulley rig. The dramatic temperature changes alter the length of the wires, and this is the way they keep tension on the wires.

There are power poles put up with piles of stones on swampy and permafrost areas. These are really stones in a wire basket to weight them down. They still pop out in 8-15 years.

There is nothing in the villages remotely resembling what we would recognize as a store or shop. No advertisements.

The Russian scientists (especially Elena Kossovich, met later) want to do some biodiversity collecting and surveying around Lake Baikal, and they take this opportunity to do so, as, left to their own resources, they have no opportunity to do so.

This is the world's largest remaining wilderness (Russian Far East, p. 10). Only 1% is protected overall, and the land is being privatized rapidly.

In the 1930's 21 million persons were prisoners here, about 25% dying each year. In 1937, 7 million were exiled by Stalin to refill the camps. (Russian Far East, p. 11).

Reached (Y)Erofey Pavlovich, named after Khabarov, his given names, during language class. Got off. Women selling food (pix).

Late lunch. 2.00 p.m.

Pulsatilla patens, Pasque-flower, by the railroad. Mostly in fruit, but a few in flower.

About 4.00 p.m. Stop at Amazar. Got off, took a couple pictures, and another Rossia train pulled in the other direction and blocked the view and access to the women selling food. Women were filling up the car's water tanks.

Lots of telephone poles down or nearly down in swampy ground.

The wildflowers have been rather good all day.

Reached Mogocha about 5.45 p.m. and got off train. Women in booths selling food (pix). The name of the town is on the train station and silhouetted against the blue sky. This is said to be the harshest place to live on the Trans-Siberian railway, because of the permafrost and the intense summer sun.

After dinner, we heard a rather intense account by a Russian naval officer, in charge of a naval newspaper, of his 20+ years trusting the Communist Party, of his sense of confusion and change, and the mixture of good intentions and corruption in the post-Soviet political period.

sign, 6,676 km. to Moscow, about 10.00 p.m.



Reached Zilovo, about 10.15, about sunset, and watched sunset. Some good light still at 11.00 p.m.

June 19, Thursday.

Waked with a stop at Karymkaya, for about 15 minutes, about 6.00 a.m. This seems more settled country, the railroad is constantly along a river.

Reached Darasun about 6.30, two minute stop. The name is on the train station. Leaving town, there was a paved road here for a bit, the first I have seen since leaving Khabarovsk. Also, oddly, a few stop signs, in English. This is the international sign code, and the English is the official international sign. Otherwise, the same wooden houses, with some large, industrial buildings, often looking mostly defunct. There are more or less frequent greenhouses, made of clear or translucent plastic. Still, no automobiles seen, though a few trucks and motorcycles.

Approaching Chita, the landscape becomes pretty solidly inhabited, and there is considerable industry. Now some automobiles are appearing, and some large apartments, doms.

Reached Chita (chee tah), population 300,000, founded 1653. Some Burhat people seen here, looking like Eskimos or native Americans or Mongolians. This is a military center, and the junction of the Trans-Siberian and the Trans-Mongolian Railroad.

Chita and Ulan Ude were off limits for foreigners until somewhat recently, the late 1980's, mostly due to tension in Soviet-China relations.

Chita was a place of exile for many revolutionary Decembrists in the 1850's.

On leaving Chita, train rode past Lenan Lake for some time.

Lecture after breakfast on Lake Baikal.

Reached Mogzon at 10.45, with stop and got off train. Train name on station (pix). The attendant woman and Mort got into some comedy here.

Athol Yales, Russia by Rail. Old Saybrook, CT: The Globe Pequot Press, 1996. (6 Business Park Road, P. O. Box 833, Old Saybrook, CT 06475. Bradt Guides. ISBN 1 898323 321. Rather good.

There is a paved road from Irkutsk to Chita.

Reached Khilok about 12.45. Two minute stop as I was waking up from a nap. Through this country the train track is frequently alongside a river.

Reached Petrovsky Zavod about 3.15 p.m. 15 minute stop. There are iron mines here.

The Decembrists were exiled here in 1825 or so, and discovered iron ore. There is a monument to them, now with Lenin on top. Lenin said he agreed with the Decembrists.

In a tale later told, a great grand daughter of the Decembrists was in St. Petersburg, when the revolutionary Bolsheviks were heard outside. Asking about the commotion, she was told, they are Bolsheviks, and they don't want anybody to be rich, like your great grandfather also wished. She replied. No, my great grandfather didn't want anyone to be poor!

I took several pictures here of the engine, of women selling food, of two children who, with their parents, were getting off the train. (The parents refused a tip.)

Changed time, back one hour, now 5 hours ahead of Moscow.

Unscheduled stop at Kizha. Big water tower (pix), cottages in distance with blue shutters. We got off and walked inside the train station, when we were called to get back on.

The landscape is drier, though not semi-arid. It is settled throughout, at least near the railroad. There are some fields of planted grain, said to be barley. Still, there is seldom seen a car, more often a motorcycle, and nothing that suggests a store.

Reached Ulan Ude about 6.00. Ulan Ude has 366,000 population. There is a famous Lenin head, and also the main Tibetan Buddhist monastery in Russia. It is the capital of the Buryat Autonomous Republic. It is the second most visited Siberian city, after Irkutsk.

The matron opened the doors on the opposite side of the track, and we could only get off there, for a shortened time, since we had had an unscheduled stop. A trainload of soldiers pulled in on the opposite track, which was crammed with young men in drab uniforms, a very ramshackle looking train. Rather revealing of the Russian military.

The train started moving unannounced, and some had to run and get on, including Virginia!

Supper at 7.00 p.m. and while eating it we passed a big paper pulp mill, now said to be environmentally friendly.

About 8.00 p.m. Lake Baikal became visible, and, then, the track often ran much closer, often with the shore only a few meters from the track.

For much of the day, the country had seemed somewhat dry, but Lake Baikal vegetation here is amply wet and lush. Dominantly birch. There are mountains with snow on them in the south, the Khamar-Daban Range, easily visible.

Pinus sibirica has an edible nut.

The train went by the second and more polluting paper pulp plant, in the setting sun. This plant is right on the lake.

About 10.45 p.m., it was getting dark. The trains stopped at Slyudyanka at the western tip of this southern part of the lake. Omul fish were being sold enthusiastically at the stop, a smoked fish endemic to the lake.

Reached Irkutsk about 12.45 a.m., and more than ready to get off the train. There was a transit to the hotel in the middle of the night, and I took a welcome shower on a rather slippery floor.

After two and a half days on the train, we are still 5,191 km. from Moscow, or 3,244 miles, the distance across the United States.

June 20, Friday.

Breakfast in hotel, 8.00 a.m. Irkutsk Hotel, run by Intourist.

City tour on a nice day. Population here is 700,000, founded in 1651 by aristocratic exiles, on the Angara River, people who had some money and culture, even though they were exiles.

We visited a square with three churches. I bought a doll set from the man who carved them in the market, and asked him to sign the set on the bottom (pix). He ran home to get another set to sell as well.

The Church of the Savior, 1706. Spasskaya. (pix) This is pictured on the doll set, the first doll. The second doll is the Church of St. Nicholas near Lake Baikal, seen the next day. The 3rd doll is the first wooden church in Eastern Siberia, some kilometers away toward Lake Baikal. The 4th doll is a typical Siberian village church. The 5th doll is a rural house.

In much of the old town, there are ornate wooden houses, with gingerbread (pix).

Visited the Church of the Holy Sign (Znamenskaya tserkov), 1763, a white church. There are the graves of two of the Decembrists here (pix).

There are 82 industrial enterprises in Irkutsk, a great many of them are closed.

The main street is named after Marx (Karla Marxa), with a monument to Lenin.

Traditionally, Siberians did not paint their houses, but only the shutters. Blue is for hope, green is for long life.

The exploration of America by the Russians was launched from here. This was once said locally to be the American district of Irkutsk! They traded fur for silk and tea.

Irkutsk is "the Paris of Siberia." There was a gold boom in the 1880's.

The Angara River, the outlet of Lake Baikal, was dammed in the 1950's for power.

Irkutsk State University Buildings seen. The university has 12,000 to 14,000 students. Irkutsk Technical University is bigger, with 25,000 students.

I bought another doll set at the Irkutsk Museum (for Shonny), once the Siberian Geological Society, now a cultural museum.

About 12.30, we had a fine lunch in a restaurant hotel room done up in indigenous decor.

After lunch, we took a tour of the botanical gardens.

Day-lily, Hemerocallis minor, seen here and pix. This is the yellow day lily we saw in masses from the train. Gray's Manual lists H. fulva and H. flava introduced from Eurasia in the U.S.

Linum sibiricum, blue flax

Pulsatilla patens, Pasqueflower

Dianthus versicolor, Campion

Aquilegia sibirica, Columbine

Larix sibirica, larch. 60% of the surrounding forest is larch.

Edelweiss, grows all around Lake Baikal, though not yet in bloom.

Lilium pumilum, a striking red lily, with a single nodding blossom, often seen later around Lake

Baikal (and later pix).

Pinus sibirica, with a non-linear bark.

Pinus sylvestris, with a linear bark. These two were seen on a striking graft, with the two kinds of trunk on the same tree, Pinus sibirica grafted over Pinus sylvestris. P. sibirica has 5 needles, P. sylvestris has two needles, and they are shorter.

Iris sibirica.

Eurasian crow, with a rather un-crow-like call, quite noisy in the trees.

Leaving the Botanic Gardens, we bought fruit at a market, near a large dom.

Then, we drove to Lake Baikal, about 60 km, about 1 1/2 hours, from about 5.00 p.m. to 6.30 p.m. Checked into hotel there, high and overlooking the lake.

Bought from women selling along the lake shore a necklace of charoite (shar o ee it), named for the Chara River, a purple mineral, rather amethyst like. The formula is  $(Ca, Na, K, Sn, Ba)_3[Si_4O_{12}](OH, F)H_2O$

The latitude here is 52°, about that of Edmonton, Alberta.

Supper about 7.00 p.m. After supper, walked down to the lake.

wagtail

some kind of wheatear.

June 21, Saturday.

Walked outside briefly, before breakfast. Scarlet rosefinch, seen well, and finch-like call.

Tour of Lake Baikal Museum, which is run by the Russian Academy of Science.

The scientists on the trip are: (in addition to the two leaders, already named)

Elena I. Kossovich, botany, Irkutsk State University

Alexander Timonin, mammologist, and does international contacts for the museum. Had been to Berkeley, and wore Berkeley jersey, spoke good English.

Alexander A. Bukharov, professor of geology, a director of the Baikal Museum. Spoke no English.

Victor Kholoden, a photographer, and a volunteer for the Botanical Gardens. He played the accordion, also was preparing a video about the trip, and showed a video made from a trip last year.

Vasily Smirnov, ichthyologist, with a beard. Spoke no English.

General notes on Lake Baikal

The size is about that of Lake Superior, but Baikal holds nearly the equivalent water of all five of the Great Lakes, or one-fifth of all the fresh water on Earth.

Baikal rift is by far the deepest land depression on the planet, much deeper than the Grand Canyon. The present lake is 5,750 feet deep, 1.1 miles, with four miles of sediment below that before reaching the bedrock. (Tanganyika, in Africa's Rift Valley, is the second deepest, 4,700 ft., and the

second oldest 2,000,000 years. It has a larger surface area, and is Baikal's analogue in the southern hemisphere. The lake is 1,637 meters deep at the deepest point, which is in the middle, near the large island.

Seldom can lakes be older than 50,000 years. They fill with sediment.

Two tectonic plates are pulling apart and drop the depression ever lower, pulling apart at about one inch a year, which means that the lake can collect new sediment without any loss to its huge volume of water.

It varies from 27 to 80 km. wide.

You can drink the water.

84% of the species are endemic.

There was a glass model of the lake volume in the museum. This is now a World Heritage site.

Baikal freshwater seal. There are 100,000 of them. Nerpa.

Omul - an Arctic whitefish endemic to Lake Baikal.

Baikal sturgeon.

Lake Baikal has 1,085 types of algae

250 mosses

450 lichens

1,500 vascular plants

255 small crustaceans

83 gastropods

86 worms

52 species of fish

Of the things underwater, 75% are endemic. One of the strangest is golymyanka, a fish like a transparent ball of fat, which lives down to 1,500 meters. oilfish, bears live young, a fatty fish. Comeophorus baicalensis.

Baikal has more endemics than any other lake.

Also, pike, grayling, and perch.

Notes from Dan Bett, "The World's Great Lake," National Geographic, June 1992, pp. 2-39. Baikal is older, deeper, and more richly endowed with life than any other lake on Earth, p. 1. There are 1,500 endemics, more endemics than in any other lake, p. 38. It is 25 million years old, compared with Lake Superior, which is 10,000 years old. There are 30 species of sculpins (a kind of fish, of Cottidae); Lake Superior has four.

There are hydrothermal vents.

It is more than a mile deep, and 1/5 of the Earth's fresh water is here, more water than in all of North America's Great Lakes combined. (Other sources say somewhat less.)

There are 40 or so towns and villages along the 2,000 km. (1,245 mile) shoreline. It is revered in Russia something like Americans do the Grand Canyon.

The Baikalsk Cellulose Paper Plant was placed here in 1996, to make (hopefully) a super cellulose for aircraft tires, by Khrushchev, though that never worked out. Synthetic rubbers got better instead.

In 1904, a railway track was laid across the ice, and 2,000 flatcars and 65 locomotives transferred to the front.

Burhats are Mongols, living here since before the 13th century. The boundary between Russia and Mongolia (then part of China) was drawn in 1727.

The Angara River runs through a series of colossal dams, built by Khrushchev in the 1960's. The Angara joins the Yenisey and then flows into the Kara Sea.

If all its 336 tributaries dried up, its volume could keep the Angara River flowing 400 years.

The pollution levels (owing to its size and remoteness) are still much lower than that lakes of Europe and North America.

There are also coal-fired plants in towns like Slyudyanka, causing acid rain.

Three tectonic plates intersect seismically. There is a seismically measurable earthquake every few hours, most too weak to feel. In 1861, a huge quake sank 310 sq. km. of the Selenga delta into the earth.

There is a Limnological Institute in Irkutsk.

The shamanist God Burkhan is offered vodka for protection. They did this regularly on the trip and make quite a joke of it.

Lake Tahoe is said by many to resemble Lake Baikal, though Lake Tahoe is only 10,000 years old and has two endemic species. Lake Baikal is over 25 million years old and has 1,500 endemics. It has a limnological process that carries oxygen to the deepest parts of the lake, and so has more life at depths than one would expect.

One shrimp, Epischura baicalensis strains out algae and bacteria resulting in especially pure water.

The Baikalsk cellulose plant pollutes 200 sq. km. with a bacteria and has devastated bottom-dwelling organisms.

The Selenga River, a 1,480 km. long tributary, supplies half the water flowing into Baikal, and is laden with wastes from three Mongolian cities, as well as from Ulan Ude, the Burhat capital.

The Nerpa is a river that presently rises nearby but does not now connect with the lake. It turns north to flow into the Arctic.

Olkhon, the largest island, is quite dry, in the rain shadow of the Primorsky Range. Often there is no snow in winter. 4,000 people, 500 are Buryat, live on the island. There was a forced labor camp here in Stalinist times.

end of notes from the National Geographic article.

Communism unraveled, and that, we think, was a good thing, but the nation that Communism did hold together unraveled, and that is a tragic thing, bringing enormous hardship, if also hope for a more democratic and prosperous future. Their unpainted houses with blue shutters are still hauntingly symbolic.

Lake Baikal (and Siberia in general) is an environmental battleground.

Afterward, a walk to the solar observatory.

Aquilegia, columbine

Maianthemum

a Rhododendron, which looks like what we call Azalea.

We took a considerable hike up to the telescope.

Looked at the solar prominences in the telescope, which you could see well.

Daurian redstart, a female, on the way back.

Daur, the Daur, a people of the Amur River basin, related to the Manchus, Manchurians.

Lunch at Hotel Baikal, then to the Church of St. Nicholas.

Then boarded the boat, the M/V Zaisan. It was built originally for towing logs. My briefcase got carried down on the smaller boat, and I had to spend some time finding where it was.

The cabin is about 7 1/2 x 10 feet, with four in the cabin. I have an upper berth that is not easy to get into.

There is a shower on board, two toilets.

Victor's daughter is on board, Anna Kuzevanova, high school age.

The small boat has a centrifugal force windshield in the center, a round glass that rotates to spin off the water in a raging storm.

We put in for the night at Peschanya Bay (means Sandy Bay). Mew gulls

I walked ashore with Mort, and climbed up to a gazebo overlook.

June 22, Sunday.

Large numbers of caddis flies on the boardwalk.

I took a walk before breakfast, in some pines back of the buildings on shore. Eurasian nuthatch, nicely seen.

After breakfast, the group took a walk ashore at Peschanya Bay. Elena Kossovich is quite good with the flora, and sharp with the mosses.

Rosa acicularis

Sorbus sibirica a Rowan tree, like mountain ash

Rhododendron dahuricum. Looks like an azalea. Has pink flowers in May

Dushekia fruticosa, formerly Alnus, alder. They have separated this one out.

Selaginella rupestris

Selaginella sanguinolenta

There is lots of Selaginella here.

Dicranum polysetum, a common ground cover in pine forests.

Hylocomnium splendens

Rhytidium rugosum, falcate leaves

Pedicularis verticillata

Cottoneaster melanocarpus, with whitish leaves. Common shrub here.

Cottoneaster lucidus, with shiny leaves.

Astragalus, sp.

Vicia cracca, Mouse vetch (this one is naturalized in U.S. from Eurasia)

Scrophularia

Polygonum divaricatum

Bromopsis inermis

Ambylynotus rupestris, a blue flower, like a forget me not.

Clausia aprica. purple mustard

Arenaria minuaria

Phlojodicarpus baicalensis, white umbellifer, on rare and endangered species list. Collected for medicine.

3% of the Irkutsk region is strictly protected.

Brym argenteum

granite of the middle-Proterozoic, 1.7 billion years old.

The group walked up to the gazebo overlook again, then returned and walked over a low saddle to Babushka Bay, with a lecture of sorts from a "walking tree," a pine that had long roots stretched out from the shifting sands.

In geological time, once this area was tropical and had rhinoceros, fossils have been found. It has been affected by global warming with 3°C rise over the last ten years. The annual precipitation here is 12", somewhat dry, and much of it comes in July and August.

Neottianthe cuculata, an orchid

Maianthemum bifolium

Iris ruthenica, in the Red Data book for Irkutsk area.

Linnea borealis, twinflower, as in the Rockies

Vaccinium vitis-idaea (grape of Mt. Ida), mountain cranberry. Also across the northern U.S. I have it from Mt. Katahdin.

Spiraea media

Returned from walk, back on board small ship, then to main ship. Lecture by Mikhail Kuzmin, Director, Institute of Geochemistry of Russian Academy of Sciences, Irkutsk, on the sediments of Lake Baikal. He was on board only a day.

There are 8 km. of sediments.

Video on the sediments, of which cores have been taken.

In 1,000 years there are about 17 cm. of sediments. In oceans there are typically 2 cm. of sediments in 1,000 years.

Visit to Sagan-Zaba, in Pribaikalsky National Park, a steppe area.

Thalictrum foetidum  
Grimmia calcareos

Visited Neolithic petroglyphs.

Then we had to be taken round a boulder on the beach jutting out into the water, six at a time, in a raft, for a walk round on the other side.

Pulsatilla turczaninowii, a different Pulsatilla.

Artemisia, sage, common here.

Leymus

Potentilla bifurca

Androsace septentrionalis

Erysimum flavum, wallflower

Thermopsis lanceolata

Polygonatum odoratum, like a Solomon's seal.

Lilium pumilum, rare and endangered species.

Stellaria dichotoma

Thalictrum petaloideum

Anemone sylvaticum

Epilobium angustifolium, fireweed

Chaemaerhodos grandiflorus, though low and without a grand flower

A warm wind came up suddenly, quite suddenly and quite warm, and they hustled us back, around by raft to where the petroglyphs were, then back to the boat, fearing bigger winds later, which did not come. The name of the wind is a sarma (??)- named for the Sarma River (Mark Sergeev book, p. 28).

June 23, Monday.

Forest fire in the distance.

Visit to Borokchin Island, with garnets and gulls.

Orstachis spinosa, the artichoke like plant.

Climbed a hill, with a visit to shaman's grave. There is an alpine look to the vegetation, due to wind, weather, and dry. Rocky steppe. The islands in Baikal are little studied botanically. There are more than 10 species of Potentilla.

There were many gulls, with four chicks swimming in the water.

House martins, with white rump, with some spectacular flying displays.

Selaginella is virtually a ground cover here.

Oxytropis caerulea

There is only one lichenologist in the region.

Sedum aizoon

Pulsatilla tenuiloba, a small Pulsatilla, lots of these here.

Alyssum

an Oxytropis with a greatly inflated pod.

Allium, wild onion

Polygala, named because it improves the milk of cows.

Rhaponticum uniflorum, a thistle.

Saxifraga bronchialis

Abietnella (Thuidium) abietina

Oxytropis tragacanthoides, a rare and endangered species. I took Elena Kossovich's picture as she was collecting it.

There are only three bryologists in the region.

(1) Leonid V. Bardunov, her supervisor, is at the Center of Russian Bryology, a professor at Irkutsk State University. He published a manual in 1961, covering the Altai and Eastern Sajon mountain area.

(2) Elena Kossovich. She has published a "Unique Objects of Lake Baikal Watershed" book. Nauka Publisher, Novosibirsk, 1990, in Russian.

The largest moss herbarium from the Ural Mountains to the Pacific is mainly in Irkutsk. She finished her Ph.D. at Tomsk State University. She did a Ph.D. on Sphagnum, peat mosses.

Back on the ship.

Off again about 1.00 p.m., to visit the "thin cape." A border area between steppe and forest. Walked to a cabin by a stream.

Minuartia

Agropyron cristatum, a lovely grass

Dracocephalum pinnatum, blue mint

Heraculum dissectum. The Colorado one is H. lanatum.

Equisetum pratense

Veratrum lobelianum

Trollius asiaticus, like an orange anemone, knee high.

Mnium cuspidatum, in the stream by the cabin.

Brachythecium

Campylium, maybe

Lilium martagon, King's curl lily, often seen.

On return walk, another forest fire, seen in distance.

Back to the boat for a late lunch, 3.30 p.m.

Off again about 5.00, with a visit to the island of Olkhon (70 km x 10 to 15 km), and a fishing village, Khurzhir. A fish processing factory runs here three months a year. The channel at this point in Lake Baikal is called the Maloe Mare, or "small sea."

There was a black kite, seen flying about town

We took a tour of the village museum.

A motorcycle with a side car came through the main street off and on, each time carrying five persons!





Walk to Shaman Rock.

From the rock, we saw mandarin ducks, first seen at a distance, then closer, when we walked to where the boat had come around to pick us up. A very striking duck.

Plover-like bird in the same area.

Return to the boat.

June 24, Tuesday.

I was catching cold and had to get up four times in the night! Tough getting in and out of the upper bunk.

The Russians too had their "manifest destiny" to cross the continent.

krai - territory

oblast - region, rather like a state, headed by a governor.

republic- headed by a President

Types of nature preservation areas:

zakaznik - a preserve, originally hunting preserves, often now for endangered species or landmarks.

National Park.

zapovednik, nature reserve, for scientific research, not particularly for recreation. Baikal-Lena Preserve, and Barguzin Preserve are of this kind.

this is a very pleasant day, but breath frosty in the air until noon.

Stellaria media - introduced from Europe.

Mysotis suaveolens

Plantago media

Iris flavissima, yellow. In the local Red Book.

Saxifraga sp., small, white, on solitary stems.

Primula farinosa

Cerastium arvense, Mouse-ear chickweed. Found widely in Northern and Southern hemispheres.

Geranium praetense

Iris ruthenica (= Russian), small, blue

Ptilotrichum tenuifolium, rather like an Alyssum.

Spring is dry here, the rains do not come until July and August.

Draba nemerosa. In U.S. from Eurasia.

We made a visit to the farm of Anton Badaev, a Buryat farmer, now a farmer, formerly an official in the Communist party, and in charge of a collective here.

This was followed by a fish fry and cookout by the lake, gala affair. A sheep was "sacrificed" and roasted, at least one leg of it was. Accordion music, dancing.

Return to ship at 8.00 p.m.

Supper at 8.00 p.m, though we hardly needed more food.

Nova Video on Lake Baikal. Available at 1-800-255-9424

The rift is seven times deeper than the Grand Canyon, though mostly filled with sediments. There are 50 factories that use the Selenga as a drain. The cellulose plant was built in 1966, and produced the first demonstrations in Russia over an environmental issue.

Along the railroad, everywhere you look there are the ugly relics of development that has failed.

The Russians moving into Siberia, demanded a tribute, or tax, and were taking half a million fur skins a year in the mid-1600's, which was 10% of the income of the Russian state.

June 25, Wednesday.

We made a visit to the Uskany Islands, and watched the seals from two locations for several hours. There were several dozen of them and we had excellent viewing, walking, then toward the edge of the water, crawling up for an overlook where they were sunning on rocks at the water's edge. There is a much more lush ground cover here. Lots of ants on the island.

The Baikal seal is Phoca sibirica. There are seven species of seals. This is related to the ringed seal (Phoca hispida) of the Arctic, possibly from a population coming down the Yenisey and Angara Rivers, or on the Lena River (see earlier). It is only seal restricted to fresh water. They are distributed all over the lake, but in open water. They can be underwater up to 40 minutes, or, in lab experiments, over an hour. They eat especially two species of golymyanka and two species of bullhead fish. They are hunted in autumn and spring. They keep air holes open in the winter. They make a kind of lair in the ice and snow in which the young are born. The female suckles pups 1 1/2 to 3 months. There are one or two pups, one bigger than the other. Mating is underwater and has never been observed. Nursing is above water.

There is danger from canine distemper, perhaps brought from the Norwegian sea by gulls. The seals construct something of a house of ice, which makes them difficult to survey.

The number of new pups is counted each year by motorcycles. There are 100,000 seals, from one to five years old, but 50% are not yet reproducing. They can live to 50 years. Satellite transmitters were put on four of them.

There is an annual professional kill of 6,000, but there are private hunters as well. To get a license you have to agree to sell the skin to the agency, for 100,000 rubles, or about \$ 17 each. The fur is largely used in the fashion market. It is not really all that warm a fur.

This seal has bigger eyes adapted for deeper diving, than other seals. The females outweigh the males.

Aquilegia sibirica.

Arctostaphylos uva-ursi. Kinnikinnik. The same plant that is widespread in the Rocky Mountains!

Empetrum nigrum. The woody ground cover.

Pyrola asarifolia

Trientalis europaea, Woodland star, first seen in Finland.

Viola rupestris  
Euphorbia alpina  
Pleurozium schreberi  
Abietnella abietina  
Saxifraga bronchialis  
Linum perenne  
Atragene sibirica, a vine like a white clematis  
Draba  
Thalictrum baicalensis, wind pollinated, good size  
Geranium caeruleum  
Mysotis, Forget-me-not  
Dicranum polysetum  
Rufus saxatilis

Back on the boat, then to wet taiga.  
species on the wet taiga:

Dicranum fuscens  
Bergenia crassifolia, woody root, broad, light-green leaves  
Lycopodium annotinum  
Abies sibirica, fir  
Equisetum sylvaticum  
Ledum palustre, Labrador tea  
Juniperus sibirica  
Aconitum, with big leaves, the tallest herbaceous plant in Siberia  
Polytrichum commune, as in the Eastern U.S.  
Polytrichum strictum (affine)

Back to the boat, and then to the hot pools. These were indeed hot, or warm, though not big pools at all.

Hesperus sibirica, large purple plant  
Pteridium aquilinum, bracken, as over much of the world.  
Thymus asiaticus  
Orobanchae caerulea, parasitic plant  
Erysimum, sp., like an Arabis  
Leymus

Baikal seal lecture

June 26, Thursday.

Some fishing early in the morning. Mostly a day of travel across the lake.

Discussion of rare plants in Russia.

Video on submarine exploration of Lake Baikal.

Lunch.

Late afternoon. Lecture on fish. There are 4-5 populations of omul, occupying various niches.

- (1) shallow water, near the shore
- (2) down to 200 meters in the main lake
- (3) another population below 200 meters
- (4) a steep vertical slope zone.

These populations spawn in different rivers, the Selenga is a main one.

We were unable to go ashore in the Selenga Delta, because the lake level is low, and the water level where we planned to go is less than a meter.

The delta was seen from some distance off, yet looking like a vast expanse of brown grass, the new season's green having not yet overtopped the last years. But with binoculars you could see the green lower down.

There is a lighthouse on an artificial island.

The marsh area is about 7 km. wide with aquatic grass, and no solid ground.

Visit to Posol'skoye, village.

Here is where a large region of delta sank below lake level in 1861, 190 sq. km. including several villages, but no one was killed. There was subsidence over a few hours.

Farewell dinner, 11.00 p.m.

June 27, Friday.

Visit to Kadilnaya Bay, and a couple miles walk along the shore.

Lubomirskia baicalensis, (loo bo meer skee uh) a fresh water sponge, washed up on the shore.

lapwing. Seen at water's edge, a striking bird. Unique among wading birds with its long wispy crest and green back. Found all over Europe and Asia.

Polygonatum

Leontopodium ochroleucum, Edelweiss, a composite, not yet in bloom.

elk scat.

Saw fossil stromatolites, and took group picture there.

Then a two mile walk down a steppe plain near the lake shore.

Stipa sibirica

Scorzonera radiata

Phlomis tuberosa, a striking mint

Galium borealis

Valeriana officinalis, Valerian. A field of this (pix)

Achillea asiatica, Yarrow. The Colorado species is Achillea lanulosa.

Polygala

Lychnis sibirica  
Schizonepetala multifida, small blue mint  
Hedysarum gmelinii, a pink legume  
Nonnea rossica, borage, with black flower  
Hieracium, sp. hawkweed  
Campanula glomerata, striking blue  
Hemerocallis minor, day-lily  
Veronica chamaedrys  
Phleum, Timothy  
Triglochin palustre, grass-like rare plant

field of Oxytropis caerulea, pix, with village in background.

Hike ended at some park buildings. The park employees mostly live here and take care of themselves, and care for the park on the side. They haven't been paid in six months.

Rhytidium rugosum

Leonod A. Malyshev  
Galina A. Peshkova, vascular plants, botanists from Novosibirsk.

telmatologist (telma, stagnant water, marsh). The study of wetlands.

A hydrofoil ferry came by, it goes to Peschanya Bay daily. There is also a second one elsewhere.

Lunch.

We got off the boat about 2.00, and wandered around the dock until 3.30. Then back to the Baikal hotel briefly. There were two Americans there, the only two seen during the whole trip in Siberia and the Russian Far East (outside of a couple at the Khabarovsk hotel who had just flown in to the international airport there). They were lawyers, working out some deal by which the Irkutsk region people could trade with the Mongolians, without consulting Moscow.

Then the bus back to Irkutsk. Irkutsk is surprisingly hot, 29° C.

I walked into town and walked through a grocery store. They still pay the cashier first and then go get their wares. It all looked very third world, but not poverty stricken, reasonably prosperous. Lots of well dressed young women.

June 28, Saturday.

Flight Irkutsk to Khabarovsk.

Up at 3.10 a.m. 4.00 bags set out in the hall, 4.30 departure. They provided a box breakfast.

Various delays in the airport, and flight out at 6.15 a.m. in a crowded plane, a TU154, Tupelov 154, named for the designer. A very full plane. They served a hot breakfast of meat and rice. But the plastic knife, fork, and spoon were so flimsy that I couldn't cut the meat and had to eat it with my fingers. I tried to peel a small orange with the knife, and was doing pretty well, and then interrupted

it to cut open the instant coffee, which I couldn't tear open, only to find I had flattened the teeth and couldn't finish peeling the orange--all the while unable to move my elbows.

But the planes had perfect take-offs and landings every time.

Landed in Khabarovsk.

Afternoon boat tour, on the Amur River, from 1.30 to about 6.30. An excellent dancing group, the Fabulous Fables.

Dinner at 8.00 p.m. Afterward a lovely sunset over the river with barges, watched from an overlook passageway on the fifth floor of the hotel, at 10.15 at night.

The hotel only has hot water mornings and evenings.

General notes on the mammals of Russia, prompted by a visit to the natural history museum in Khabarovsk.

There were find mounted specimens of the following:

Sea cow skeleton. Steller's Sea Cow, or Great Northern Sea Cow. Hydrodamalis gigas. Was found in the Bering Sea area. Steller was a naturalist who accompanied Bering. There were once lots of them, but they were unfeared of humans and slaughtered relentlessly for food and leather. The sea cow has been extinct probably since 1768, though there were later reports of it in various areas. There are only four skeletons in the world, one in this museum. The closest remaining relative is the dugong in Australia.

sea otters  
king crabs

grey wolves, Canis lupus

dhole, Cuon alpinus, a wild dog, resembles Canis, but has shorter skull and is placed in a different genus. In this museum this animal is labeled as a Manchurian wolf, or red wolf. Found in southern Siberia and Central Asia to India and Malay peninsula. Walker's Mammals, p. 1080. Endangered species.

Siberian tiger. Amur tiger. Felis tigris.

As late as 1700's there were tigers in the Lake Baikal vicinity.

Bears

Asiatic black bear, Ursus thibetanus, in this museum called a Himalayan bear, black with white spot on chest. Walker's Mammals, p. 1086.

brown bear, grizzly bear, Ursus arctos

Caribou (North American term), reindeer (European term), one species, Rangifer tarandus, in this museum called a Northern deer. This species was all across northern Europe, Asia, and America. There are even records of it in Idaho in early nineteenth century.

wapiti, elk (American term), red deer, Cervis elaphus, in this museum called a noble deer. The American elk, Cervis canadensis, is by many considered to be a subspecies of Cervis elaphus.

Musk deer, Moschus moschiferus, small and spotted. Siberian, Mongolian, Manchurian, Korean, nothing like this in America.

Roe deer, Capreolus capreolus, though Walker shows Capreolus pygurus as the species in Siberia, thought by other to be a subspecies of C. capreolus. Not in America. They have generally adapted well to civilization, even though they are much hunted.

boar, Sus scrofa, native to Europe and Asia. The European wild hog.

moose (North American term) or elk (European Term), Alces alces

bighorn sheep, Ovis canadensis

Old world badger, Meles meles. The American badger is put in Taxidea taxus.

sable, Martes zibellina. Close to martens, fishers. Originally throughout the taiga zone, from Scandinavia to North Korea. Mainly terrestrial but it can climb. One of the most valuable fur bearers, its pelt avidly sought since ancient times. Several hundred thousand skins were traded annually during the late eighteenth century in the west Siberian city of Irbit. Populations crashed and later recovered. A single skin can sell on the world market for \$ 500.

beaver (introduced)

leopard, Panthera pardus

lynx, Felis lynx, same species in Americas and Eurasia.

fox, Vulpes vulpes  
ermine

yellow-throated marten, Martes flavigula. Although in same genus as sable, the pelt was of little value.

wolverine, Gulo gulo. Originally from Scandinavia to Siberia, Alaska, Canada, U.S.

After the museum, we went shopping in the Amber Room, not far away, lovely display of amber.

Then back to the hotel. Left at 2.30 for the airport.

Took off at 4.30 p.m, promptly.

During the flight, there were striking views of snow-capped mountains, and, later, mountains in almost solid snow cover.

We flew over Magadan Oblast. Magadan was a famous horror story town of Stalin's Gulag. See Lonely Planet guide.

Flew by Mt. Denali, silhouetted on a rather sunset like skyline, though the sun did set, it never really got dark. Six hour flight to Anchorage.

Then to San Francisco (about 8.30 a.m, local time), then to Denver, leaving at 12.00, and not really home till 7.00 p.m., living the same day twice, crossing the date line, and arriving more or less the time I took off from Khabarovsk!

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end of Siberia trip

July 16-18, 1997, Tuesday through Friday. Rawah Wilderness backpacking alone, mostly to see that I was in shape for the Yellowstone trip forthcoming. On the Rawah Trail at Rawah Guest Ranch by 9.30. Steady climb and got into Lake # 1 about 3.30. Spotted fawn seen nicely on the way up. Plenty of snow packs still left, and, although I had thought I might go on up to McIntyre, I decided against it and pitched camp at Lake # 1, actually about a quarter mile back. Plenty of mosquitoes, which, generally, were the bane of the trip. Warm night, good weather.

I was here first in July 1970 (27 years ago!), again in August 1988, with Giles.

Thursday, I did the circuit, back down to the Camp Lake trail, then up to Sandbar Lakes, Lower an Upper, then to Rainbow Lake, then back out to the main Rawah Trail, to Lake # 3, which is above timberline, then back down past Lakes 2 to Lake 1. Wilson's warbler, probably, maybe an immature MacGillivray's. Lunched back at camp, taking my food out to a more windy spot to avoid mosquitoes and to get a view. In the afternoon, I walked around to McIntyre Lake and found the spot where Giles and I camped there in 1988. It is on the north side, a flat place in some trees up a ways from the lake. White crowned sparrow, and the usual birds. Trail crew came by; the chief has been here six summers. Snow is usually gone by July 4, and this is the latest he has seen it. Mosquitoes are the worst he has seen. He also fussed at me for not being 200 feet from the trail, since the Link Trail ran not so far behind my camp, which I hadn't even seen that the trail was there when I pitched camp, nor had I seen any recent footprints on it when I discovered it the next day.

Friday, hiked out, not too fast, to avoid damage to my toes. Left about 8.00 a.m. and out at 1.40 p.m. Nice doe on the trail on the way down. About 20 miles of hiking.

Sore knee, which I nursed along during the Montana trip, and for several months afterward.

#### Yellowstone and Scapegoat Wilderness

July-August 1997

July 26, Saturday. With Bill Forbes, drive to DuBois, Wyoming. Lunched at Split Rock, which recalls the Pony Express and Buffalo Bill's riding some three hundred miles on twenty different horses over some twenty hours, averaging fourteen miles per hour. In DuBois, we drove up to an overlook over the Wind River Mountains. Also visited the Rocky Mountain Bighorn Sheep Foundation; there is a population of sheep here, more easily seen in winter.

July 27, Sunday. Drove into Grand Teton National Park, then Yellowstone Park. Elk seen in opening by the roadside. Moose killed on road. Stopped briefly at the Visitor Center in the Tetons. Moose seen in willows. Continued into Yellowstone. There was a glimpse of a grizzly, south of Fishing Bridge, the same area where I had seen one in May-June.

There were perhaps a hundred bison crossing the river in Hayden Valley, in groups of twenty or so.

Quite a sight. They had to swim the deeper part and were underwater except for heads sticking out. The calves seem to have no big problem; they did it as well as the adults.

Four bull elk in a field, lying down, not long before Canyon.

Checked in at Canyon, and then drove out to the Grand Canyon of the Yellowstone. Osprey on nest at one of the overlooks. Drove the Mount Washburn Road, and out the Lamar Valley road as far as Slough Creek, but no bear activity. A good thunderstorm on the way back.

Night at Canyon.

July 28, Monday. Up at 4.30 a.m. and off to Lamar Valley. For the first few miles we were in and out of fog, but the Mount Washburn area was clear. Stopped at Slough Creek for twenty minutes or so, then on to Buffalo Ranch. The Lamar Valley was covered in fog, but it cleared not so long after we met the backpacking group at Buffalo Ranch.

Backpacking in Grizzly Country. Leaders: Michael Bartley and Marla Darby, both students at CSU. I had Michael in environmental ethics class two or three years back. Others: two from Red Lodge and Roberts, Sally Rodibaugh and Aileen Anderson; she is a sheep farmer. Ron Mayer and Nora Scanlan; he is with social security; she is a guidance counselor. Taryn Samuels, working for Yellowstone National Park. E. A. McCracken, Jr., formerly from Arkansas, now Helena MT, interested in hunting and fishing. Pat Fiore, young boy who got soaking wet, had worked briefly for Forest Service.

We shuttled to the trailhead at Warm Springs Picnic area, leaving the most of the cars at Pebble Creek campground. On the trail, we climbed 1,200 feet and then dropped into Pebble Creek drainage. Lunched a little past the top, with various tips from Michael and Marla about how to behave in grizzly country. Camped at site 3P5, in good weather, but it started raining after we went to bed and pretty much rained for 24 hours. Gentle but steady rain all night. So far we kept pretty dry.

July 29, Tuesday. A wet day. I managed to get the tent down and packed up when it wasn't raining. Off at 9.30 a.m. and hiked down Pebble Creek all day. Three good stream crossings, which took some trouble trying to keep halfway dry feet. Good wildflowers. Camped at 3P1. Still raining; we set up camp in and out of the rain, though there were some blue spots. Deer around camp, rather tame, and, later, chasing each other around.

July 30, Wednesday. Clear day, and I climbed out into wet pants and boots.

Pam Gontz hiked in and walked out with us. She had come into be sure she caught me about the Ft. Collins flood, but didn't tell me until we were out at the trailhead. One splendid bear tree, with nice claw marks. But otherwise no fresh bear sign.

Out about 1.00 p.m. Showered at the Ranch, dried out, and repacked for the drive to Missoula. Stopped at Mammoth Hot Springs to phone home and found that my office had been flooded out, floor to ceiling. The University suffered \$ 130 million damages, lost the books in the basement of the library, including journals. Lost all the textbooks in the bookstore. I called a *New York Times* reporter, who had tried to contact me. Jane had a half inch of water in the basement at home. Montana trip continued below.

Events in Ft. Collins area:

July 28, Monday. Heavy storms in early morning hours, concentrated near the foothills west of town. Eastern portions of the city received little in the way of rain from these early storms, although 1-2 inches fell in the north and northeast parts of town. Light rains off and on through the day. Heavy rains continued over Horsetooth Reservoir and LaPorte, which received an additional 4 inches of rain. Ditches in LaPorte spilled over their banks, but overall Ft. Collins experienced few complications from the daytime rains. But the soil was becoming saturated, with the result that what came later was all runoff.

About 5.30 p.m. the deluge started and continued in waves of heavy showers, mainly west of Taft Hill Road on the west side of town. Nearly 3 inches of rain was reported in this area by 7.30 p.m. But the worst was yet to come.

The most intense rainfall came between 8.30 and 10.00 p.m., Monday evening, and was concentrated between the Quail Hollow and Cedarwood Plaza in southwest Fort Collins. This storm reported dropped 9.5 inches to 10.2 inches of rain in the area west of the Taft Hill and Drake Road crossing in less than five hours. Much lesser amounts fell over most area of Fort Collins and north toward Wellington. Accurate rain gauges recorded 14 inches of rain for the thirty hour rainfall period, and more than 10 inches in LaPorte. These totals are nearly the average annual precipitation.

The water massed together and ripped along tiny Spring Creek and other ditches and creeks in the Fort Collins drainage and through the CSU campus.

Before it was over, 1,600 homes were adversely affected. When the Spring Creek flow reached the western edge of the two mobile home parks near central Ft. Collins, it washed railroad cars off the tracks and across three huge culverts through the railroad embankment. There the waters built up enough force to destroy the mobile home park and to kill five persons.

Flash floods in Colorado are typically at night.

continuing, Montana trip:

Bill and I drove to Missoula, good drive, arriving about 10.00 p.m. Night at the Holiday Inn, Parkside.

July 31, Wednesday. Thelma Elser picked us up; we shuttled the car to Elser's ranch, and she drove us to the North Fork (of the Blackfoot) Trailhead, where we joined Smoke and the packing (Smoke Elser). Drove by the former Lindberg ranch. The Blackfoot River is the river featured in A River Runs Through It, although the filming was done on the Yellowstone River. Some kettle and kames topography en route.

Wranglers: Cody Hensen, P. O. Box 129, Drummond, MT 59832, has finished at Missoula. Raised on a Montana ranch. Rich Keeland, 5509 Mainview, Missoula, MT 59803. Studying petroleum engineering at Butte.

Orville Daniels and Olleke Rappe-Daniels, 1810 Riverside Dr., Missoula, MT 59804. He is retired chief of Region 1, USFS, which includes fourteen forests in Montana, Idaho, Dakotas. She is still

an active forester.

Pat and Bernadette Bannister, 1120 Morningwood Lane, Great Falls, VA 22066. They also have property in Montana, and we picked them up halfway out on the road up the Blackfoot. She does some fundraising for the Craigheads and their foundation.

Jon and Karen Robbins, 2836 Melillo Drive, Walnut Creek, CA 94596. He is lawyer for oil company in environmental compliance. She is schoolteacher.

Smoke has been packing 40 years in the Bob, cumulatively 22 years of nights spent in the out-of-doors.

My horse is Coco, a mare. Bill's is Liberty.

The Bob Marshall Wilderness complex includes the contiguous Bob Marshall Wilderness, the Great Bear Wilderness, and the Scapegoat Wilderness, which are 1.5 million acres. There is another million acres of surrounding wildlands. On the complex is almost every big game species in North America.

The Scapegoat Wilderness was created in 1972. The centerpiece of the region is the Scapegoat Massif, an enormous lofty plateau of rock surrounded on east and west sides by sheer cliffs, the lower extension of the Chinese wall on the eastern side. The peak of Scapegoat Mountain is 9,202 ft on the eastern edge of the massif. Flint Mountain (9,079ft) is at the north western end. The massif is really a long limestone plateau, about 4 miles long, and the actual peak is only a bump on the massif.

A U.S. surveyor, Chapman, working in the area in the 1897-1900 period gave the peak the name Scapegoat after he had difficulty surveying the area (Graetz, p. 131).

On the trail about 11.00 a.m. We are riding in the Canyon Creek Fire, burned 247,000 acres in September and October 1988, the year of the Yellowstone fires, and the largest fire in the history of Montana. The fire started in Canyon Creek valley, near the eastern edge of the Scapegoat wilderness. Smoke heard the lightning bolt that started it and he and his wranglers went over and put it out, or at least suppressed it. But a forest crew came in next day and said it was a prescribed natural burn, so let it go. It flared up the next day and took off. The decision to endorse the let burn policy was made by Orville Daniels, who was on our trip.

We watched recovery after fire throughout the trip, which was rather uneven. Some lodgepole was waist-high, but much was no more than knee-high, and on lots of slopes there was hardly any evident recovery at all. Generally, the recovery was slower than I might have hoped.

Generally wildlife on the trip was more sparse than might have been expected. There were no recent sign of elk, though lots of older sign. No sheep seen. No goats. No bear or wolf tracks, though there were coyote tracks. Smoke says he thinks the fire dispersed the wildlife to other parts. Although there is food, the burned forest is hot and there is no cover, either for shade or for hiding.

Lots of Ceanothus. The stems that stick out above the snow are killed back, and this was often evident. Lots of fireweed.

Rode up Hobnail Tom Trail. Rode by a pack bridge, lunched, and rode by North Fork Cabin. Stopped at North Fork Falls, which could only partly be seen from our side.

Camped at Sarto Creek, in flats near river. Very good campground. Lichens, old man's beard, had surprisingly re-grown on the dead timber.

Rode 11 miles today.

3 deer in camp.

August 1, Friday.

Packer boots are a cross between a riding boot and a hiking boot, which many like in Montana.

Packed up and on the trail. Reached Carmichael Cabin, and stopped there. A sheepherder built it. He had 4,000 sheep in Depression days here. (We camped here on return trip.)

Climbed steadily through the morning, and lunched on top. Lovely up top, with nice view, nice day. Then descended below the cliff, which is the south end of the Chinese Wall. Two mule deer under the ledge some distance away, in spectacular setting. The first had enormous antlers, a big buck.

Rode through one basin and over to the next, which is Half Moon Basin, where we camped several days, in spectacular setting. We first tried to camp at a lower camp which had been trashed out, and then rode back up to camp higher. This required riding over and back over a quite swampy area that the horses had a hard time getting through. Later, we found a way around it that we used several times.

August 2, Saturday.

Rode over to the next basin (Green Fork, of Straight Creek, flowing north) and hiked up Scapegoat Mountain, at least to the plateau beneath the summit.

Rode by Spring Falls, which flows out of a cave. This is a sort of double falls, flowing out halfway up the cliff, with a long, high cave behind it. Looks something like great faucet flow out of a mountainside, halfway up the mountain. The cave here is reported to be two miles long (Graetz, p. 41). Pictures of this later. Also a lake below, which we swam in later.

Rode horses as far as we could and tied up about tree line. Then we climbed on foot, a steep climb, skirting a cliff, and then reached a more rolling climb, with several ridges, and some snowfields. Found a pre-World War II military plane that had crashed in 1938, Smoke found it in 1958, twenty years later. Some pieces were scattered around, but most of it, wings and engine in one place.

Lunched a bit later, and then came to the top plateau, and spent an hour or so here. There were lots of sinkholes on top, and you could toss a rock into some of them and it would be several seconds before you would hear it hit the bottom.

Some quite pretty little heath gardens here, also with Dodecatheon in them.

Down and back to the horses about 5.00, back in camp about 7.00, a good day.

August 3, Sunday. Day in camp to let horses rest. Clark's nutcracker.

Walked down to the swampy area and prowled around. Had lunch down there. Trout in the creeks, cutthroat trout. Clark's nutcracker. Hoary marmots, see below. Columbian ground squirrel, Spermophilus columbianus, a big one, almost like a prairie dog, but with a more bushy tail than a prairie dog. Found in Montana, Idaho, British Columbia, somewhat limited distribution. Robin.



Lots of caves in the Chinese wall face. This is the Lewis overthrust. Limestone.

One out of every four acres of National Forest in Montana is wilderness.

Satellites seen in the sky both nights, quite bright.

The second star of the Big Dipper is double. Indians used to separate out those who had eyesight good enough to be braves this way.

August 4, Monday. Day ride around Halfmoon Peak.

Rode down Halfmoon Creek, then turned to go down Straight Creek, and reached Green Fork cabin, where the Green Fork (of Straight Creek) leaves. Lunched there, with some backpackers. Rode up the Green Fork to the lake down from the falls coming out from the cave. Walked up a bit toward the falls (pix), and then came back for a swim. The lake has leeches in it.

The ride was 9-10 miles, a little of it (the Straight Creek part) on the Continental Divide Trail.

Horses are built to go uphill better than downhill.

rain in the night.

August 5. Tuesday.

Packed up and began the ride out.

5 hoary marmots (Marmota caligata) on the highline ride under the wall. This marmot is from Alaska down to northern Montana, barely, and is found in the high mountains. It has a whiter (hoary) head and shoulders, with black on the head, not so on the Yellow-bellied marmot (Marmota flaviventris) of most of the Western U.S., also in Montana, but hardly here. Interestingly, the eastern woodchuck (Marmota monax) swings around up from the Eastern U.S. and across Canada and is found in bits of Idaho. See distribution maps, Burt and Grossenheider. Another one is confined to the Olympics.

If the horse walks away from you when mounting, grab her mane good with the reins holding her up tight, and she won't move while you get on.

Walked downhill past the divide for about a mile and a half. Smoke said it was too steep to ride the horses down.

Golden eagle perched in a tree as we crossed the divide.

Grouse perched in burned tree as we walked the horses past.

Ride of about 8 miles. Camped at Carmichael cabin. Pancakes, now six mornings in a row. Smoke cooks quite a breakfast.

Bill and I took a stroll in the woods for an hour or so. Olive-sided flycatcher. Fawn with white spots, seemed young for this late in the season.

August 6, Wednesday. Ride out, about 14 miles. Out about 3.30 p.m., good but uneventful ride out.

Total ride about 65 miles.

Shuttle back to Missoula, arriving about 5.30 p.m. Osprey on nest on telephone pole on the way back.

Supper with Andrew Light, and friend from University of Alberta, Edmonton, in medical ethics.

August 7, Thursday. Bill caught the shuttle to the airport, and I drove home. Left 6.00 a.m., and drove 875 miles, arriving 9.20 p.m. Long drive. Nighthawks were striking in the sky over Wyoming at dusk.

Arrive Ft. Collins to pick up the pieces after the flood.

I had the fire in Montana while the flood was in Ft. Collins, and hope that the pestilence and famine and other apocalyptic events can be postponed.

Graetz, Rick, Bob Marshall Country. Helena, Mt: Rick Graetz, publisher, Montana Magazine, 1985. ISBN 0-938314-15-7. A good book. Copy in CSU library.

Moore, Bud, The Lochsa Story: Land Ethics in the Bitterroot Mountains. Missoula, Mt: Mountain Press Publishing Co., 1996. The Lochsa country is a region of the Bitterroot Mountains, Idaho. Moore is a forester with the U.S. Forest Service.

Flora seen on the trip:

Abies lasiocarpa, subalpine fir

Acer glabra, Rocky Mountain maple

Achillea, yarrow

Actaea rubra, baneberry

Agroseris, false dandelion

Allium, onion

Alnus, alder

Amelanchier, serviceberry

Antennaria, pussy-toes. Didn't try to sort out the species.

Aquilegia flavescens, columbine. All yellow up here, no blue ones.

Arabis, sp. Rock cress

Arctostaphylos uva-ursi, Kinnikinick, Bearberry

Arenaria, sand-wort, several species

Artemisia, sagebrush

Aster, asters, several species, but I didn't try to separate them.

Aulacomnium palustre, Bog moss

Balsamorhiza sagittata, balsamroot, though not in flower

Betula glandulosa, bog birch

Campanula uniflora, harebell

Campanula rotundifolia, harebell

Castilleja, paintbrush

Ceanothus velutinus, lots of it, often enough to give an odor to the woods.

Cerastium sp. Mouse-ear chickweed

Cirsium foliosum, elk thistle

Claytonia, spring beauty

Clematis columbiana, clematis

Cornus stolonifera. Dogwood

Delphinium sp., larkspur  
Dodecatheon pulchellum, Shooting star. Often quite nice.  
Dryas octopetala, Mountain dryad.  
Epilobium angustifolium, fireweed. Lots of it.  
Epilobium glaberrimum, Northern willow-herb  
Erigeron, fleabane  
Eriogonum sp., buckwheat  
Eritrichium nanum, Alpine forget-me-not  
Erythronium grandiflorum, Glacier lily  
Fragaria virginiana, strawberry  
Frasera speciosa, Monument plant. Green gentian  
Gaillardia, gaillardia  
Galium, bedstraw  
Geranium, geranium  
Gentiana calycosa, mountain gentian, blue gentian  
Habenaria, bog orchid  
Heraculum sphondylium = lanatum, cow parsnip  
Hieracium aurantiacum, hawkweed, the orange one  
Hieracium, sp. a yellow one.  
Hypericum sp., St. John's wort  
Juniperus communis, juniper  
Larix, larch  
Linanthus septentrionalis. Linanthus (no common name). filiform stems, tiny white blossoms. Leaves appear as a whorl of linear leaf segments, interpreted as two deeply divided at the nodes. Calyx has green costa and hyaline segments between. I had to key this one when I got home. Harrington doesn't show it; Weber finds it in North Park. pix, Rickett. From the Halfmoon campsite area.  
Linum lewisii, blue flax  
Linnaea borealis, twinflower  
Lonicera involucrata, Twinberry honeysuckle  
Lupinus sericeus, silky lupine  
Mahonia repens, Holly-Grape. Oregon-grape.  
Menziesia ferruginea, Menziesia  
Mimulus sp, a good-sized yellow one.  
Mysotis alpestris, Alpine Forget-me-not  
Osmorhiza, sweet cicely, tho Smoke calls it wild licorice  
Parnassia fimbriata, parnassia. Especially nice on this trip.  
Pedicularis racemosa, lousewort, the white one, Parrot's beak  
Pedicularis groenlandica, Elephantella  
Penstemon sp., several.  
Perideridia gairdneri, yampa, a small white umbellifer.  
Phacelia sericea, Silky phacelia  
Phlox multiflora, phlox  
Phyllodoce empetriformis, pink mountain heath, mountain heather. Splendid in the little rock "gardens" at the top plateau of Scapegoat Mountain. This one is not in Colorado.  
Picea engelmannii, Engelman spruce  
Pinus albicaulis, whitebark pine  
Pinus contorta, lodgepole pine  
Pinus flexilis, limber pine  
Pinus ponderosa, ponderosa pine  
Polygonum bistortoides, American bistort

Polygonum viviparum, Alpine Bistort  
Polytrichum, sp. haircap moss  
Populus tremuloides, aspen  
Potentilla fruticosa (= Pentaphylloides floribunda), Shrubby cinquefoil  
Prunella vulgaris, Heal-all  
Pulsatilla patens = Anemone multifida, in Dorn. Seen only in seed, but seen often.  
Pseudotsuga menziesii, Doug fir  
Pyrola aserifolia, Pink alpine pyrola  
Ranunculus, buttercup, various species  
Ranunculus adoneus, snow buttercup  
Ribes, sp, currants, gooseberries  
Rosa woodsii, rose  
Rubus parviflorus, thimbleberry  
Rubus idaeus, raspberry  
Salix, willow  
Salix nivalis = reticulata. Snow willow.  
Sambucus, elderberry  
Saxifraga, saxifrage, several of these  
Saxifraga brochialis, Spotted saxifrage. like a large moss  
Sedum, stonecrop spp.  
Senecio triangularis, Arrow-leaved groundsel. Common.  
Shepherdia, buffaloberry  
Silene acaulis, Moss campion  
Solidago, goldenrod  
Sorbus, mountain-ash  
Spiraea, Spiraea. Everywhere  
Symphoricarpos, snowberry  
Swertia perennis, star gentian. Purple, in the wet areas. Tricky, really a sympet, but looks like a polypet. But the twin hair glands are there at base of petals (= lobes).  
Thalictrum, sp. Meadow Rue. Common  
Thalspi alpestre, alpine candy tuft  
Tragopogon, sp., goatsbeard  
Vaccinium, vaccinium, whortleberry  
Valeriana, Valerian  
Verbascum thapsus, mullein  
Veratrum viride, False hellebore  
Veronica sp., speedwell  
Vicia, vetch  
Xerophyllum tenax, beargrass. But not especially in bloom.  
Zygadenus sp., Death-camus. Especially nice on this trip.

Still nursing the sore knee, which wasn't done any good by the horseback ride.

August 12, Tuesday. Hike to Gem Lake in RMNP, leading a group from the Society for Contemporary Philosophy, about fifteen. Very pleasant, with enough threat of rain to make it exciting, but none really fell. Nice coyote on way out at MacGregor Ranch.

September 19, 97. Red fox, seen on way out to Giles' trailer, at the railroad tracks just before

entering his trailer park. After dark, seen in headlights. It ran across the road, and then turned around and ran back. Quite red, long bushy tail straight out as it ran.

September 29, 1997. Jane saw three racoons on the street near the house, in the dark, coming home in the car.

October 19, 1997. Alamosa National Wildlife Refuge with Jerry Freeman and Jim Gilmore, and Jane. I spoke there the afternoon and evening before for Jerry Freeman. Jim Gilmore is wildlife sculptor, former rancher there. Birding on the refuge for a couple hours. Gadwalls, many of them. Canada geese, a few. Widgeon, flicker, loggerhead shrike, blubird, kestral, marsh hark, kinglet, migrating in shrubs, mountain chickadee, meadowlark, pied-billed grebe, lesser yellowlegs, greater yellowlegs, snipe, great horned owl, golden eagle - nice flew up over road, magpie, redwings, prairie falcon. Then back into town and drove north of town to find some sandhill cranes, found about two dozen of them, also calling. Two cottontails.

Half a dozen deer. One beaver seen nicely swimming in a wetland pond. Freeman is a co-author of the Colorado Bats book, leads an annual tour here to watch Mexican free tailed bats coming out of a mine north of the Great Sand Dunes. Shrub common in dry fields here they call chico, which is greasewood, Sarcobatus vermiculatus (Chenopodiaceae), abundant on alkaline flats, poisonous containing calcium oxalate, nevertheless a useful forage plant if the diet is mixed and sheep do not graze in pure stands. Also much Atriplex.