

TRAVELS NOW AND THEN

© Christopher Earls Brennen

JAPAN 1993

Sun. Apr.4, 1993

Flew United Airlines 897 from LAX to Narita, Tokyo, Japan.
Train to Ueno and Shinkansen to Sendai.



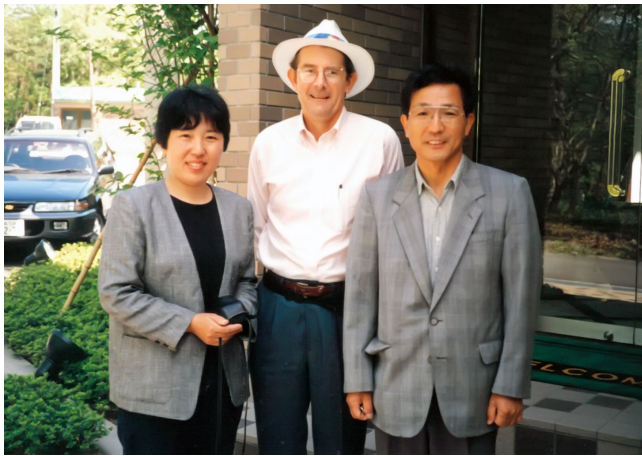
With Professor Shima at Tohoku University, Sendai



Poster of talk at Tohoku University



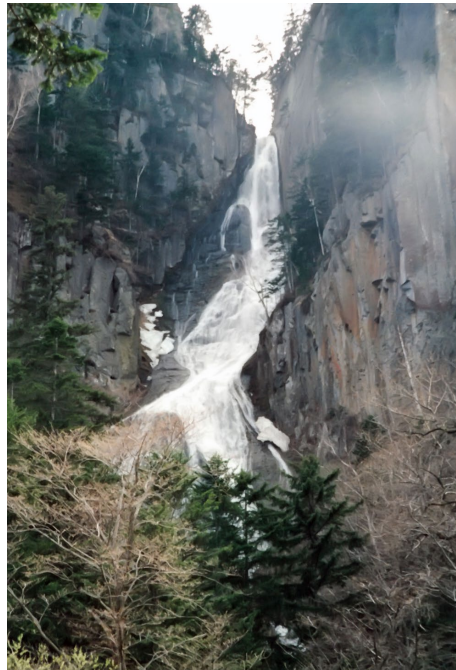
Summit of Mount Zao, near Sendai



With Sachie and Kenjiro Kamijo at Zao Mets



Hiking with Kenjiro Kamijo in Zao



Hiking With Sachie and Kenjiro Kamijo at Zao

Mon. Apr.5, 1993

Tues. Apr.6, 1993

Wed. Apr.7, 1993

Thurs. Apr.8, 1993

Fri. Apr.9, 1993

Lunch with Oki? at Prince Hotel, Shinagawa

Sat. Apr.10, 1993

Flew JAS651 from Itami (Osaka) to Kagoshima and JAC513 from Kagoshima to Tanegashima. Met by JAXA personel who drove us to the test and launch facility on Tanegashima Island.

Sun. Apr.11, 1993



Imperial Palace, Tokyo



Golden Temple, Kyoto

Mon. Apr.12, 1993

Tues. Apr.13, 1993

Flew JAC502 from Yakushima Island to Kagoshima and JAS810 from Kagoshima to Fukuoka.

Wed. Apr.14, 1993

Thurs. Apr.15, 1993

Fri. Apr.16, 1993

Flew JAS931 from Fukuoka to Sendai.

Sat. Apr.17, 1993

Sun. Apr.18, 1993

Mon. Apr.19, 1993

Tues. Apr.20, 1993

Wed. Apr.21, 1993

Flew JL845 from Sendai to Sapporo.

Thurs. Apr.22, 1993

Fri. Apr.23, 1993

Sat. Apr.24, 1993

Sun. Apr.25, 1993

Mon. Apr.26, 1993

Tues. Apr.27, 1993

Wed. Apr.28, 1993

Thurs. Apr.29, 1993

Fri. Apr.30, 1993

Sat. May 1, 1993

Sun. May 2, 1993

Flew JL512 from Sapporo to Haneda, Tokyo

Mon. May 3, 1993

Tues. May 4, 1993
Climbing Omine-san with Tsujimoto.



Omine-san prohibition!



Climbing on Ominesan trail.



Yamabushi pilgrims near summit.



Yamabushi rite of passage.



With Tsujimoto on Ominesan summit.

Wed. May 5, 1993
Flying gliders on Mr.Oba's hill outside Osaka.



Flying gliders with Tsujimoto on Mr.Oka's hill.

Thurs. May 6, 1993



Approximate date: Himeji Castle.

Fri. May 7, 1993

Sat. May 8, 1993



Approximate date: Hiroshima Peace Park.

Sun. May 9, 1993

Mon. May 10, 1993

Flew Japan Air Service 651 from Itami to Kagoshima and then JAC 502 from Kagoshima to Tanagashima.
Visit to and tour of NASDA Space Center in Tanagashima.



Tanagashima Space Center.



Tanagashima Space Center.



Tanagashima Space Center.

Tues. May 11, 1993

Ferry from Tanagashima to Yakushima.

Car tour of Yakushima.



Outdoor, seashore onsen on Yakushima.

Wed. May 12, 1993 Climbed ?? on Yakushima Island. Japanese macaques.



Japanese macaques on Yakushima.



Summit of Kuromi-dake on Yakushima.

Where Japan's mainland succumbs to the sea, and roads peter out into sad endings, the journey doesn't end. The archipelago stretches down in a chain of semi-tropical volcanic islands almost to Taiwan, extending Japan's influence and culture far beyond the shores of Kyushu. The very isolation that surrounds each of these islands creates an individuality, an inevitable feeling of separateness.

The island of Yakushima, a four-hour ferry trip south from the port of Kagoshima in southern Kyushu, is a pristine wilderness of lofty peaks and ancient rain forests, with a small population living around the coast. Part of the Yaku-Kirishima National

Park (Japan's first), the island is home to several endemic species of animals and plants including the *Yakuzaru* (Yaku monkey), the *Yakushika* (Yaku deer) and the symbol of Yakushima, the enormous *Yakusugi* cedar tree.

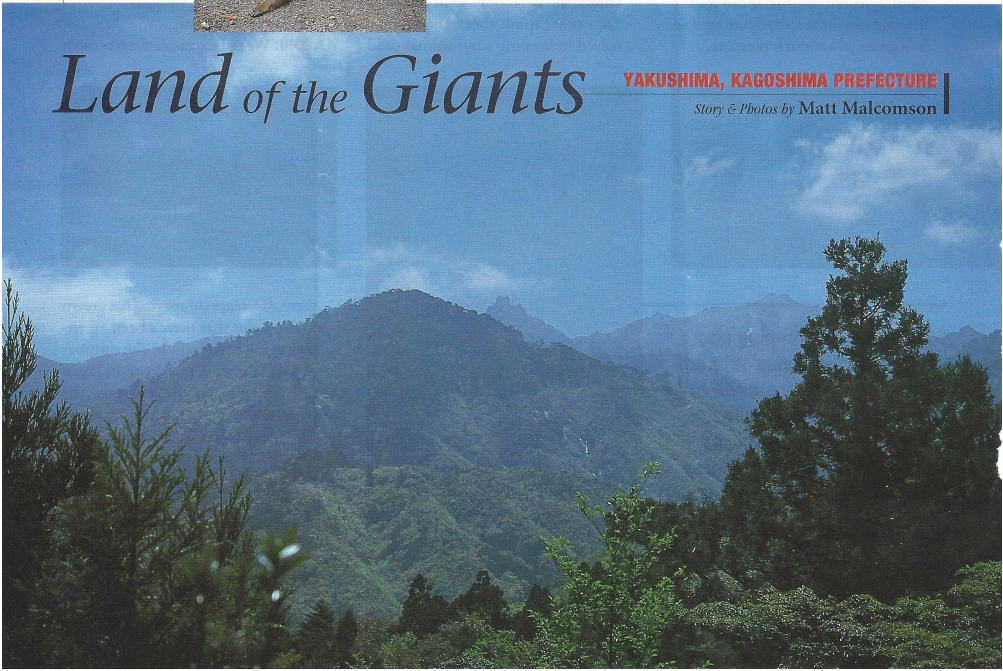
Ages-Old Roots

Most people visiting the quiet little port town of Miyanoura head straight for the forest. A road leads up to the trailhead at Shiradani Gorge and, after filling my water bottle at a mountain stream, I started up the trail. Right away, the forest seemed to speak to me. Magnificent trees, living for hundreds or thousands of years, stood in silence, but the forest was a living, breathing place. Water rushed by, birds sang out their cryptic songs, and tiny lizards scampered out of my path.

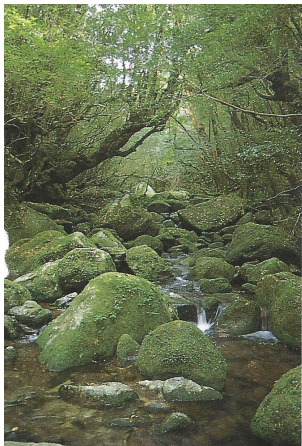
The grand cedars are splendid to behold. Their roots spread out across the forest floor like slithering serpents, and their gnarled trunks

rise upward toward the sky. Rocks, fallen branches and stumps are covered by a thick carpet of green moss, and a rich aroma of leaves and earth hangs in the air.

Even during a major national holiday, the trail was eerily deserted; the few souls I did meet were all going in the opposite direction. Most had started early, and were on their way back from visiting the two oldest and most famous trees. Wilson Kabu is an enormous stump of a *Yakusugi* that was cut down in 1586, and re-discovered in 1914 by American botanist Ernest Wilson. The stump sits in shadowy rain forest a strenuous few hours' hike up the trail; moss covers everything, and mist hangs in the air. The stump is hollow—with an area of ten tatami mats, it's big enough to accommodate a car!—and houses a shrine built for the tree's *kami*, or spirit. Further on up the steep trail is Jomon Sugi. This huge tree has a trunk 4.5 meters wide



Land of the Giants YAKUSHIMA, KAGOSHIMA PREFECTURE | Story & Photos by Matt Malcomson



and is named after the period when it first started growing—roughly 3,000 years ago. Branches and roots spread chaotically about, a process that must have begun before Japan was even a nation.

‘No Clothes Allowed’

For three days I hiked over the mountains, spending my nights in small mountain huts. These were simple, unmanned affairs with wooden floors where hikers could spread their sleeping bags. As the sun slid behind the mountains and the darkness consumed everything, people inside would light their lanterns and stoves. A short-wave radio buzzed with the following day’s weather forecast, while soft voices and the smell of sake drifted through the semi-darkness to where I lay.

I met civilization again at a forestry track above the somewhat touristy Yakusugi Land. Built for those wanting to see the cedars without the strain of the climbing, Yakusugi Land has some nice trails laid out through the forest lasting 30 minutes to an hour. Tour buses and taxis climb the gravel road that leads up to it from the town of Ambo on the east coast. For a ¥300 admission fee, you are free to wander along the different paths among the various marked trees. It’s rather less of an adventure, but beautiful all the same.

After a few days in the mountains, I headed for the south coast and the hot spring bath set into the rocks on the beach. Waves come right up to the edge of the *onsen*, making for a unique experience. A sign indicates that clothing is not allowed into the bath, and there are no separate places for men and women. Frazzled old men sit there unabashedly sunning themselves, contentedly looking on as countless women read the sign, look at the men, and make their exit.

beautiful coral formations as a hiding place. Crabs scurried away as soon as they saw me, and overhead two hawks danced in the sky.

Yakushima’s unique ecosystem, with its rare and endemic species, are luckily protected. Most of the island, except for the narrow inhabited strip around the coast, were put on UNESCO’s list of World Natural Heritage sites a few years back. It’s comforting to know that the island will stay much as it is for years to come. ■



Back to Nature

In the last year, a new resort-style hotel has opened on Yakushima. Otherwise, the accommodation is simple but adequate. My favorite was a campsite on the southwest coast in a field overlooking the sea. The ocean current called *Kuroshio* that comes up from Southeast Asia means the sea temperature here is warm, and enables a wide variety of marine life not normally found at this latitude to survive. Before breakfast one day I clambered over the rocks on the shore to see the various tide pools, and saw several varieties of coral growing beneath the water. Small multicolored fish darted back and forth using the

GETTING THERE

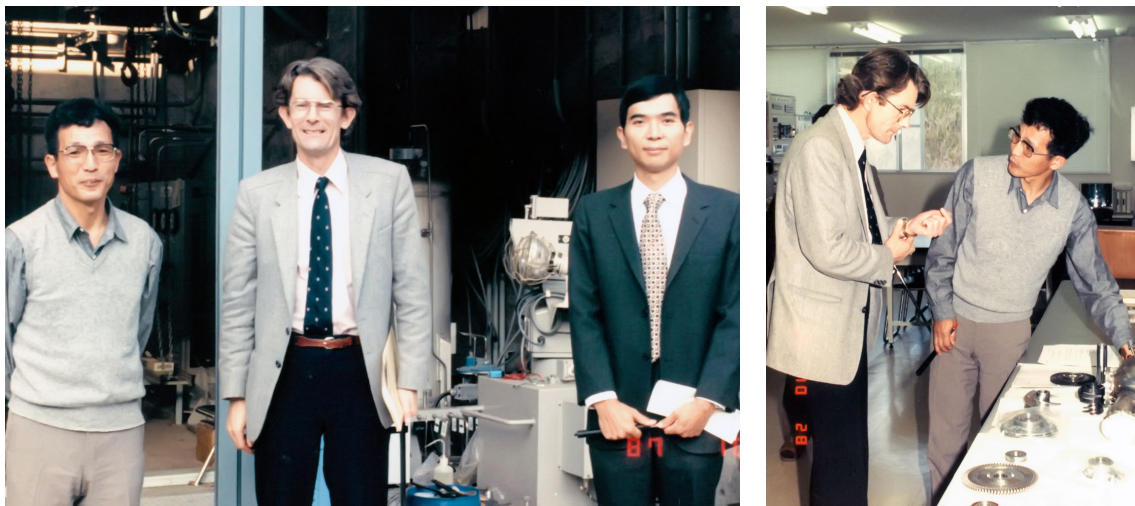
Although Yakushima’s coastal areas are warm and pleasant most of the year, the mountains are much wetter and colder. The best time for hiking here is in summer—but don’t forget your raingear. Yakushima is served by local flights from Kagoshima airport, or by ferry and hydrofoil from Kagoshima and Miyazaki. (Note: the hydrofoils have limited baggage space and do not transport bicycles or other large items.)

ANA Service to Kagoshima			
Tokyo		Kagoshima	Tokyo
9:30	—	11:10	8:25 — 10:05
11:30	—	13:10	12:30 — 14:10
13:00	—	14:40	14:30 — 16:10
15:30	—	17:10	16:30 — 18:10
19:00	—	20:40	18:40 — 20:20

Schedules are subject to change. Please call ANA Reservation (0120-029-222) in advance to confirm the flight time.

Japan from 1993

- Thurs. May 13, 1993**
Flew JAC 502 from Yakushima to Kagoshima and then JAS 931 from Kagoshima to Fukuoka.
Visit to Kagoshima between flights?
- Fri. May 14, 1993**
Seminar in Kyushu University and dinner with Nakasake.
- Sat. May 15, 1993**
- Sun. May 16, 1993**
Flew JAS 931 from Fukuoka to Sendai.
- Mon. May 17, 1993**



At Kamijo's lab, NASDA (JAXA) Kakuda Space Propulsion Laboratory, Miyagi, Japan.

Tues. May 18, 1993

Wed. May 19, 1993

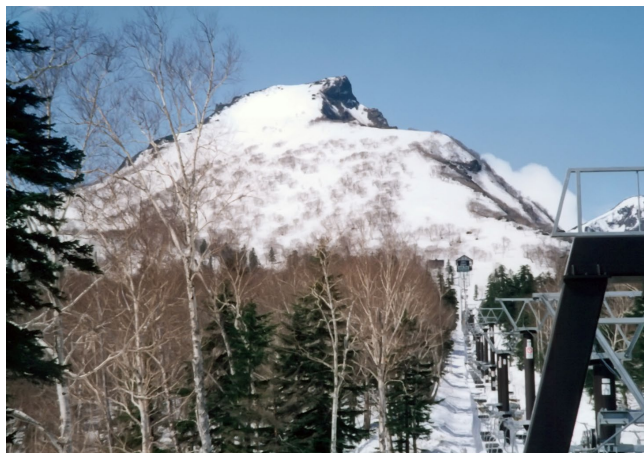
Thurs. May 20, 1993

Hiking in Zao with Kenjiro and Sachie.

Fri. May 21, 1993

Flew JAS 931 from Sendai to Sapporo, Hokaido.

Sat. May 22, 1993



Approximate dates: Kurodake peak above Sounkyo.



Shirotsuku peninsula, Hokkaido.

From "Fuji 1993" in "The Far Side of the Sky":

Most hikers have an unwritten list of mountains that they would like to climb. And Mount Fuji is on many of those lists because of the hallowed place it occupies in the Japanese culture and mythology. The Japanese regard the symmetry of its nearly perfect conical shape as implying a sacred origin and the number of paintings, view points and photographs that celebrate views of Fuji are numberless. Yet this same monotonous symmetry makes the hike up Mount Fuji somewhat boring. The Japanese have a saying that everyone should climb Fuji once but only a fool would climb it twice. What makes the hike even less enjoyable is that, for the few summer months when the snow is gone, there is an almost unbroken queue of people trudging up to the summit.

Yet, despite all this, when I went to Japan for a couple of months in the spring of 1993, one of my private objectives was to get to the top of Fuji-san. When I mentioned this plan in a letter to my principal host, Professor Akira Shima of Tohoku University, he replied that this would not be possible because "Mt. Fuji is closed". It seems that the Japanese, who love rules and usually obey them without question, had long ago established "a season" for climbing Fuji that begins on July 1. I, being singularly unimpressed by arbitrary rules, still thought I might be able to sneak away some weekend and attempt the climb. It seems, however, that my reputation had preceded me for it became clear that Shima and my other hosts had arranged a schedule that did not have the two successive free days which would be necessary for the attempt. And so my ambitions were thwarted. Of course, it must also be added that during the month of April when I would be within striking distance of the mountain, the depth of snow and the severity of

the weather make it foolish for anyone to attempt the climb and particularly foolhardy to try to do it alone. Nevertheless, I felt some sense of frustration especially since I had come well-equipped for the snow. Early the previous winter I had purchased crampons (spiked frames you strap to your boots) and had practised snow climbing with them on the slopes of Mount Baldy in California.

During the first month and a half of my stay in Japan I did have the opportunity to climb a number of mountains in central and southern Japan. Almost always some fellow academic accompanied me. Thus I climbed To-no-dake (4892ft) in Tanzawa Quasi-National Park with my friend, Yoichiro Matsumoto, of Tokyo University. And with another friend, Yoshi Tsujimoto of Osaka University, I climbed two very interesting and very different mountains. One day during "Golden Week" we drove to the village of Dorogawa in the wilderness area south of Osaka and climbed the sacred mountain of Sanjo-go-take (5640ft) also commonly known as Omine-san. We encountered many shamanistic pilgrims or "Yamabushi" whose sect requires them to make the pilgrimage to this summit at least once a year. Near the summit the trail was lined with stone memorials and the air was filled with chanting and incense. Later, during a visit to the beautiful island of Yakushima south of Kyushu, we negotiated our way past a large group of Japanese macaques and through fantastic semi-tropical forest and meadows with crystal streams on our way to the magnificent 6007ft summit known as Kuromi-dake. These climbs were very enjoyable and interesting but not exceptionally challenging. I still harboured a desire to climb a really challenging mountain, to escape from my caperones and, perhaps, to demonstrate that I could have climbed Fuji anyway if I had been given a chance. Call it Irish stubbornness.

Then, in late May, I travelled to the relatively remote northern island of Hokkaido. Because of the severity of the winters this island was only settled about 150 years ago by the Japanese or "Yamoto" who displaced the native inhabitants known as the Ainu. The island is still sparsely populated and that population is almost entirely confined to the flat valleys between the snow-covered mountain ranges. Consequently the government has been able to set aside large sections of the most beautiful mountains as National Parks. Moreover, the people of Hokkaido, descendants of frontiersmen, have a better developed sense of personal liberties. As a result I was allowed to travel to the outback on my own to visit the largest national park in Japan, the rugged wilderness known as Daisetsu-zan National Park. Specifically, I travelled first by train and then by bus to a small mountain village called Sounkyo that lies in a deep gorge in Daisetsuzan National Park. High above the rim of the gorge is a range of towering, snow-covered peaks and the most dramatic of these is the spectacular 6509ft peak known as Kurodake or "the black peak". The name was clearly motivated by the basalt cliffs that surround three sides of the summit and stand out in stark contrast to the snow-field on the fourth side. In its shape, Kurodake is often likened to the Matterhorn though, in all honesty, it is much less steep than that fabled alpine landmark. Kurodake and the other peaks of this range are inaccessible except for a brief period in the late summer when the snow dwindles to patches. Then, when most of the snow has melted, Kurodake is easy to climb. But in late May it is very clear that to all intents and purposes "Mt. Kurodake is closed".



Kurodake



Sounkyo from above

However, no one was there to stop me. Moreover, in an effort to draw tourists to this remote place, the local authorities had very recently constructed a cable car that climbs from Sounkyo up to the rim of the gorge and provides a substantial start in climbing Kurodake. So early in the morning, I took the first cable car to the top station and sneaked off onto the surrounding snowfield. No one kept any special watch for no one would dream of doing such a thing since "Mt. Kurodake was closed". After about a quarter of a mile I was out of sight of the top station and turned toward the mountain. The first hour and a half of the climb was fairly straightforward. My crampons made climbing in the snow quite easy and I made steady progress up the snowfield that led toward the summit. But toward the end of the second hour, the slope began to get quite steep. I progressed by digging in the toe spikes of my crampons and using my gloved hands to maintain my stance. Only occasionally did I encounter snow into which I sank to my waist. But as I neared the summit, the snow began to get very deep and the mist began to thicken. I began to fear an inadvertant encounter with the edge of the black cliffs. Eventually, despite my stubbornness, I had to conclude that it was too dangerous to continue. Though I felt that the summit might be only a few yards further, it would have been extremely foolhardy to continue. And so I turned around.

It was only then that I realized the true precariousness of my position. Climbing a steep, snow-covered slope is one matter. Trying to descend is quite another matter entirely. It was much more difficult to secure a firm foothold when descending than when ascending. I barely inched my way down the slope. There were several moments when only the slimmest margin separated me from a life-

threatening slide down the mountain. And it took many minutes to recover my nerve after those moments. I would breathly very deeply to regain my composure and then take another small step. It also occurred to me that I definitely did not want to die on that mountain and that I very much wanted to see my wife and children again. Eventually, I made it to the lower slopes where I could have confidence in my ability to stop any slide. Then I made rapid progress walking down the snowfield, retracing my steps in the snow. The hours of daylight were rapidly dwindling as I sneaked back into the cable car station. I half-expected an official "unwelcoming" reception party. But no one seemed to have noted my long absence and I caught the last descending cable car to the base station.

An odd sort of euphoria came over me once I reached the safety of the cable car. Perhaps it was the oft-described, heightened appreciation of life that seems to follow any brush with death. Perhaps the accumulated adrenalin provides a natural narcotic. I know I thought especially of Doreen and my children. And, for the moment, I lost that sense of purpose that usually governs my travels. At the base station, I lingered somewhat aimlessly amid the souvenir stands. It occurred to me that I had bought very little for my wife and children. Yet, like most souvenir stands, there was little here that was worth buying and I would normally have passed straight on. But, for reasons I still do not fully understand, my attention was transfixed by one particular object, a bright pink baseball cap proclaiming "Hokkaido". Acting on impulse, I bought this garish hat, imagining that I would give it to my eldest daughter. Perhaps it was that the cap reflected the fluorescence of my life at that moment.

And so I still had not overcome the kind of challenge I had sought. I had failed to climb Mt. Kurodake; I had discovered that indeed "Mt. Kurodake was closed". And yet I now understood why I felt such resentment when I heard that phrase. Mountains are wild and free and dangerous and beautiful. They are never conquered; one merely trespasses upon them for a brief moment in time. For anyone to arbitrarily declare that a mountain is closed seemed an insult to that spirit and to its reflection in my soul. I felt some measure of satisfaction that I was stopped by my own frailty and not by some arbitrary rule. Some measure of joy for having experienced the wild beauty of that mountain at that particular moment in time. And some measure of pride that the moment was mine alone.

Moreover, I was to find out just how close I did, in fact, come to conquering Kurodake. I stayed the night in Sounkyo and the next morning dawned bright and beautiful, sunny and clear. I had a couple of hours before my bus left and so I decided to ride the cable car again in order to take some photographs of Kurodake from that vantage point. I was rewarded with a magnificent view from the observation deck on the roof of the top station. Kurodake and the other neighbouring peaks rose majestically above me, shining in the morning sun. The observation deck was also equipped with the standard telescopes one often finds in such locations and so I idly focussed one of these on the summit of Kurodake. And there, clear as day, were my tracks in the snow in the otherwise pristine snowfield. They led directly up toward the summit and came to a halt only a few yards from the peak. Though I did not know it at the time, a small effort would have placed me at the top. There were no other tracks in the snow near the summit. Clearly I had been the first person to attempt to climb Kurodake that year.

Someday I will return to Japan during late July or August. I will catch the bus from Tokyo to the Fifth Station more than half-way up Fuji and I will follow hundreds of others as they make their way up the well-worn trail to the summit of that symbolic mountain. Maybe, like many others, I will climb in the dark in order to enjoy the beauty of the sunrise. No doubt I shall feel some sense of accomplishment. But it will not come close to the raw power of my experience on Kurodake and my elation at seeing my footprints reach toward the summit of that mountain. Perhaps I am crazy.

Sun. May 23, 1993



Approximate date: Ainu village, Hokkaido.

Mon. May 24, 1993

Tues. May 25, 1993

Wed. May 26, 1993



Approximate date: On Mount Usu volcano near Sobetsu, Hokkaido.



Showa-shinzan near Sobetsu, Hokkaido.

Thurs. May 27, 1993

Fri. May 28, 1993



Approximate date: Welding traditional Japanese sword at Japan Steel Works, Muroran.

Sat. May 29, 1993

Sun. May 30, 1993

Mon. May 31, 1993

Tues. Jun. 1, 1993

Wed. Jun. 2, 1993

Leaving Muroran Institute of Technology.

Flew Japan Airline 512 from Sapporo to Haneda, Tokyo.

Thurs. Jun. 3, 1993

Sixth Int. Workshop on Multiphase Flow, Tokyo, June 1993.

Brennen, C.E. (1993). Cavitation bubble dynamics and noise production. Proc. 6th Int. Workshop on Multiphase Flow, Tokyo, 1-28.

Fri. Jun. 4, 1993

Sat. Jun. 5, 1993

Flew United Airline 890 from Narita to Los Angeles.

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Last updated 7/30/99.

Christopher E. Brennen

TRAVELS NOW AND THEN

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ENGLAND 1993

Sat. July 10, 1993
Fly UA962 from LAX to LHR



London, Buckingham Palace



London, Buckingham Palace



London, Houses of Parliament



Dartmoor



Lynmouth, Devon



Lynmouth, Devon



Lynmouth, Devon



Clovelly, Devon



Clovelly, Devon



Clovelly, Devon



Clovelly, Devon



Polperro, Cornwall



Polperro, Cornwall



Polperro, Cornwall



Tintagel, Cornwall



Tintagel, Cornwall



Glastonbury



Second Int. Conf. on Micromechanics of Granular Material, Birmingham, England, Jul. 1993.

Brennen, C.E., Ghosh, S. and Wassgren, C. (1993). Vertical oscillation of a bed of granular material. *Powders and Grains 93*, ed: C. Thornton, A.A.Balkema, Rotterdam, 247-252.



Portaferry, County Down





Lord Kelvin, Botanic Gardens, Belfast



McReynolds homestead





Cranagh Dhu, Magherafelt



Cranagh Dhu and Mum's new place



Bridge over the Moyola, Curran

Sun. July 18, 1993

Fly UA921 from LHR to IAD
Then UA6258 from IAD to Albany

Tues. July 20, 1993

Fly UA415 from Albany to ORD
Then UA841 from ORD to LAX

Tues. Aug.24, 1993

Fly UA 900 from LAX to JFK

Thurs. Aug.26, 1993

Fly UA 900 from JFK to LHR

Fri. Aug.27, 1993

Fly BD 82 from LHR to BFS

Wed. Sep.1, 1993

Fly BD 83 from BFS to LHR

IUTAM Symp. on Bubble Dynamics and Interface Phenomena, Birmingham, England, Sep. 6-9, 1993.

Kuhn de Chizelle, Y. and Brennen, C.E. (1993). Comparison of observed and calculated shapes of travelling cavitation bubbles. Proc. IUTAM Symp. on Bubble Dynamics and Interface Phenomena, Kluwer Academic Publ., 207-217.

Thurs. Sep.9, 1993

Fly UA 963 from LHR to LAX

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Last updated 7/30/99.

Christopher E. Brennen



CHARLES M. VEST, PRESIDENT

CAMBRIDGE, MASSACHUSETTS 02139-4307

Nov. 14, 1993

Dear Chris:

Thank you for taking time from your busy schedule to show me a bit of the M.E. activity at Caltech. It was quite impressive. The student enthusiasm for the senior scooter project was palpable, and the robotic work was fascinating. Of course what I can't get out of my mind is the strange set of wave phenomena in the granular materials. I'd love for my old friend Chia - Shun Yih to observe them if he is ever around Caltech.

You are running an exciting and important endeavor.

Sincerely,
Charles Vest

Thưa Lệnh Thân Mẫu
Ông Bà Bùi Hữu Cẩn

M. et Mme Gérard Kuhn de Chizelle

Trân trọng báo tin Lễ Thành Hôn và
Lễ Vu Quy của con chúng tôi

Ont la joie de vous faire part du mariage
de leurs enfants

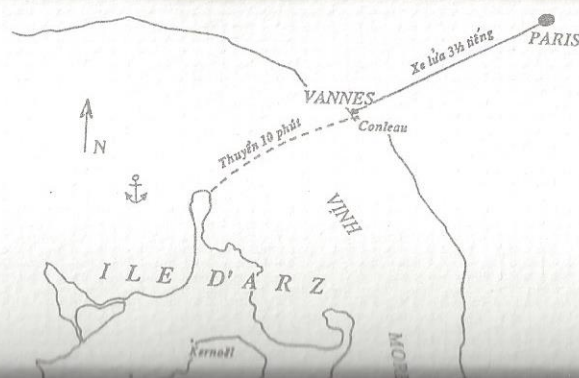
Ánh-Ngọc & Yan

Hôn Lễ sẽ được cử hành vào lúc 3 giờ chiều
Thứ Bảy, ngày 2 tháng 1 năm 1993
(Nhằm ngày 17 tháng 12 năm Nhâm Thân)
tại Thánh Đường Notre Dame, Ile d'Arz.

et vous prient d'assister à la cérémonie religieuse
qui sera célébrée le Samedi 2 Janvier 1993
à 15 heures en l'Eglise Notre Dame
de l'Ile d'Arz.

191 Hai Bà Trưng, Sài Gòn, Việt Nam

9 Place de la Chapelle, 78380 Bougival, France



California
Institute of
Technology

Caltech *News*

Volume 27, No. 4
August 1993



CALIFORNIA INSTITUTE OF TECHNOLOGY

Pasadena, California 91125

Thomas E. Everhart
President

(818) 356-6301
FAX (818) 449-9374

June 14, 1993

Dr. Christopher E. Brennen
360 Olive Tree Lane
Sierra Madre, California 91024

Dear Dr. Brennen:

It gives me great pleasure to notify you that at the meeting of the Board of Trustees on June 11, 1993 you were appointed "Executive Officer for Mechanical Engineering." This appointment is in addition to your appointment as Professor of Mechanical Engineering and is for a three-year term. While you are Executive Officer, a salary increment of \$5,000 will be added to your base salary; therefore, your salary, effective July 1, 1993, will be \$129,000 per annum. This action was recommended by the Division of Engineering and Applied Science and approved by the Provost and me. If these terms are agreeable, please acknowledge acceptance of this appointment by signing the enclosed copy of this letter and returning it as indicated.

I appreciate your willingness to assume this additional responsibility.

Sincerely,



Thomas E. Everhart

Enclosure

cc: J. H. Seinfeld

CALIFORNIA INSTITUTE OF TECHNOLOGY

Pasadena, California 91125

Thomas E. Everhart
President

(818) 356-6301
FAX (818) 449-9374

June 4, 1993

Dr. Christopher Brennen
360 Olive Tree Lane
Sierra Madre, California 91024

Dear Dr. ^{Chris}Brennen:

I am writing to inform you that your salary for the next academic year has been increased to \$128,000 per annum, effective October 1, 1993. With this change in salary, the Institute's contributions to your benefit programs will be adjusted. These adjustments will be reflected in the statement of benefits that you will receive next year.

Salary increases this year reflect economic realities, rather than the true value of contributions to the welfare of the Institute. While the Institute has not had to reduce campus staff as have many other academic institutions, our income has not kept up with the pressure of needed expenditures, producing serious strain on our resources. The Institute has always tried to be second to none in areas where it chooses to work; as we move ahead, it will continue to strive to be second to none in the quality of its faculty, and in the rewards it provides them.

I believe the high reputation of the Institute depends on the quality of the professorial faculty. Your contributions to Caltech are truly appreciated by your colleagues, by those of us who serve in the administration, and by the Board of Trustees.

Sincerely yours,



Thomas E. Everhart

Jun-Young Edwin Jeon
830 S. Kingsley Dr.
Los Angeles, CA 90005
(213) 386-9964
July 30, 1993

Dear Professor Brennen,

I cannot thank you enough for writing me a great letter of reference. I am sorry that I have failed to thank you earlier. I originally was going to write you as soon as I was admitted into Claremont, but it slipped my mind as I was trying very hard to stay employed. I have been bouncing back and forth at different jobs within McDonnell Douglas because of our restructuring, and I think I finally will end up at Flight Control Systems on C-17 program. Yes, I was admitted into the joint program between Claremont Graduate School and Cal State Long Beach. It is a Ph. D program in Engineering Mathematics. It will probably take me 5 or more years part-time to complete. I am undecided between control systems and signal/image processing as my main area of study. As you well know, they are both math-intensive areas of electrical engineering and I think it will do me a lot of good if I can stay on and complete the Ph. D program.

By the way, when I went up to Claremont about two months ago, I met Professor Cumberbatch. I might have misspelled his name, but he told me that he knew you very well. I guess I lucked out by asking you to write me the letter. How can I ever repay you for your time and consideration?

Thank you very much once again. I hope everything is going well at Caltech. I wish the best of lucks to you and to my alma mater.

Most Sincerely,

A handwritten signature in cursive script that reads "Jun-Young Edwin Jeon".

Jun-Young Edwin Jeon

UNIVERSITY OF OXFORD

L.C. Woods

Professor of Mathematics (Theory of Plasma)
(Emeritus)

Telephone: Enquiries (0865) 2-73525

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Mathematical Institute

24 - 29 St Giles'

Oxford OX1 3LB

June 13, 1993

Professor Christopher Brennan
Dean of Students
Caltech
Pasadena
California 91125
USA
FAX (818) 568-2719

Dear Chris,

The College is about to announce the name of the new Master. He is an historian, now at Chicago, who used to be a fellow of the College. He came second to Barry Blumberg in the competition four years ago. Your name was advanced by several fellows and received serious consideration. One of my friends, among the electors, believes that you would have been a better choice than the historian. Anyway, I thought you would like to know what happened. The College remains dominated by Arts Fellows.

My book, *An introduction to the Kinetic Theory of Gases and Magnetoplasmas* has now been published by the OUP. Noel Corngold will be interested in it, since it refutes some of the received theory in which he is an expert. Give him my regards.

Sorry we are not having you as Master.

It is possible that you remember my eldest daughter Coral, who made the mistake of marrying Jack de Wet's son, Steve. More recently she married Nick Schofield, who also read engineering at Balliol. She died of cancer on 24th April. Nick was an excellent husband, caring for her in her illness. Nick's first wife, Angela, also died of cancer, but at a much earlier age.

My regards to Doreen.

With best wishes

Les



A National Treasure

When TIME magazine recently devoted a special issue to the "American Best," it introduced profiles of three of this country's scientific institutions as "the envy of the world, churning out ideas, devices, and medicines that have made the U.S. prosperous, improved the lives of people around the globe, and profoundly affected their perception of the world and the universe." One of its three examples of such national treasures was Caltech, a distinguished part of Pasadena, California.

The links between the city of Pasadena and the California Institute of Technology have been forged as the two grew up together over the last century. They share

a suitable location for a southern California astronomical observatory, and he found it at Mount Wilson, becoming the first director of the observatory that was built there. Over the next few years, he also played a vital role in the life of both Pasadena and Throop Polytechnic. As a member of Pasadena's planning council and a friend of Henry Huntington, he helped create both Pasadena's Civic Center and the Huntington Library. As a member of TPI's Board of Trustees, he persuaded his fellow board members to drop the existing grammar and high schools in favor of developing a first-class technical school of college rank.

Land for a new campus on the eastern edge of Pasadena was provided by another trustee, Arthur Fleming, and his

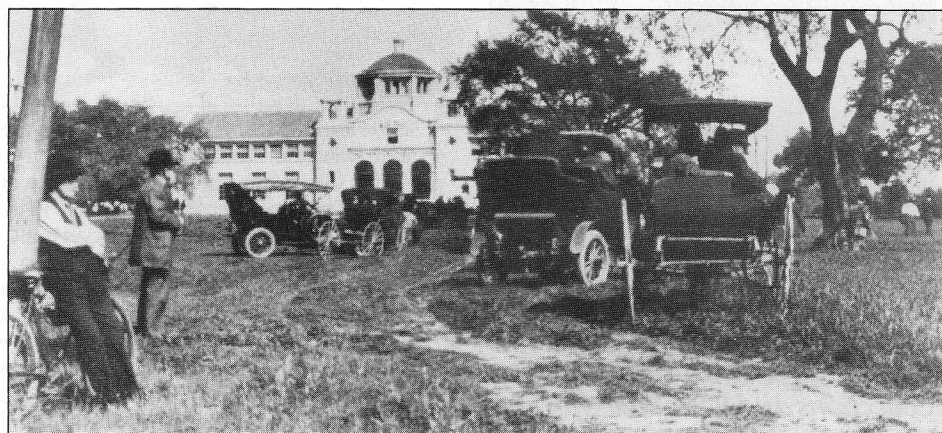
was ably seconded by Hale and the third member of Caltech's three men of vision—chemist Arthur Amos Noyes.

The original engineering curriculum—always leavened by required studies in the humanities—was broadened over the years to include physics, chemistry, geology, biology, and the humanities and social sciences. Beginning in 1930, under Theodore von Karman's leadership, aeronautics served the growing needs of southern California's aircraft industry, and for many years Caltech supplied most of the highly trained aeronautical engineers in this country.

In the 1930s, experiments in rocketry led to the establishment of the Jet Propulsion Laboratory. Work was begun on a 200-inch telescope for an observatory to be built on Palomar Mountain. The Kerckhoff Marine Biological Laboratory began operating in Corona del Mar. The Kresge Seismological Laboratory was established in northwest Pasadena, and research in seismology and design of earthquake-resistant structures began. Among the best-known of the results was development of the Richter Scale for measuring the magnitude of earthquakes.

For five years, beginning in 1940, Caltech personnel and facilities were devoted almost exclusively to military work. More than 24,000 men were instructed under the Management War Training Program, and Caltech supplied the U.S. Armed Forces with more than 90 percent of all rockets used during the war. Because the weapons were so urgently needed, the Institute turned out over a million rounds before industry could tool up to supply the demand.

In 1946, Caltech entered a new era under a new president—Lee A. DuBridge. Among the scientific and academic innovations during his presidency was the Institute's new program of instruction and research in astronomy. World War II had interrupted progress on construction of the 200-inch telescope, but it was finally dedicated in 1948, and it has brought astronomy one of the most valuable research tools ever built. Nor has astronomy at the Institute been limited to optical astronomy. With the completion in 1960 of two 90-foot antennas at Caltech's Owens Valley Radio Observatory, studies began on radio galaxies. A 130-foot antenna and a three-dish millimeter-wave interferometer have been added since, as well as a submillimeter observ-



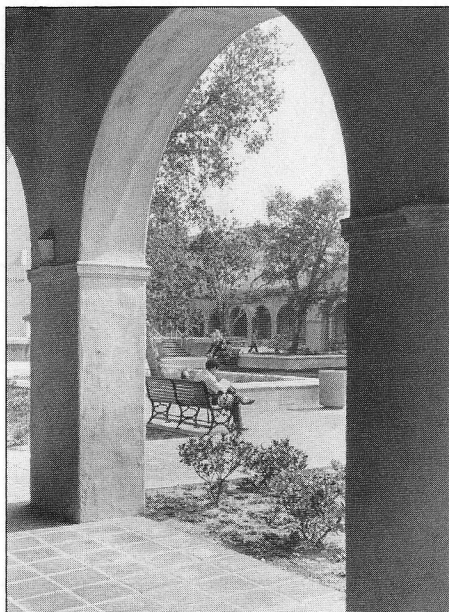
a forefather in The Honorable Amos G. Throop, a retired Chicago businessman who moved to Pasadena in 1886. By 1888 Mr. Throop had been elected to the city council, and the following year he became Pasadena's third mayor. Almost everyone in town knew "Father" Throop.

He was also "father" to the forerunner of Caltech, Throop University, which opened with an enrollment of 35 students on November 2, 1891, in the four-story building at the southeast corner of Fair Oaks Avenue and Green Street. For some 20 years, Throop University, which became Throop Polytechnic Institute in 1893, served young men and women in this area—ages approximately 7 to 20—as one of this country's first schools of manual training. In 1892 the school moved to better quarters at Raymond Avenue and Chestnut Street, and by 1894 it had an enrollment of 300.

Pasadena and TPI welcomed another gentleman from Chicago in 1907—George Ellery Hale. He came looking for

daughter Marjorie. Mr. Fleming also made a gift of \$25,000 toward construction of Caltech's first building, and the citizens of Pasadena raised the remainder. Pasadena Hall was erected at a cost of \$170,000 and formally dedicated on June 8, 1910. Enrollment in 1909 had been 600 men and women; the first class registered in Pasadena Hall was a select 31—all male—who worked for bachelor of science degrees in electrical, mechanical, or civil engineering.

In 1913 TPI became Throop College of Technology, and in 1920 it was again renamed, becoming the California Institute of Technology. In memory of the school's founder, Pasadena Hall became Throop Hall, and one more gentleman from Chicago arrived to play an influential role in Caltech's history—Robert Andrews Millikan. As chairman of the executive council from 1921 until his retirement in 1945, Millikan led the Institute to a position of world preeminence in scientific education and research. He



atory on Mauna Kea in Hawaii. Big Bear Solar Observatory was built in 1969.

In 1958, the Jet Propulsion Laboratory, which Caltech administers for NASA, launched this country's first successful satellite, Explorer I. That was only the first of a series of flight missions—the Rangers and Surveyors to the Moon; the Mariners to Mercury, Venus, and Mars; and the Infrared Astronomical Satellite, which mapped the sky in that region of the spectrum. These missions have made the lab a leader in the unmanned exploration of the solar system. Currently, Voyagers 1 and 2, launched more than ten years ago, are heading for the outer edges of space after spectacular encounters with Jupiter and Saturn. Voyager 2 is now on its way to Neptune after encountering Uranus in January 1986.

Flight projects awaiting launch include Galileo (to Jupiter), Magellan (to map the hidden surface of Venus), Ulysses (to the Sun's poles), and Mars Observer. The Hubble Space Telescope, which is expected to see deeper into space than any instrument ever trained on the sky, will carry the JPL Wide-Field/Planetary Camera. And the lab also performs research into more earthly subjects. One effort, a collaboration between campus and JPL, is the Hypercube Project. The Hypercube uses a new kind of computer architecture—a concurrent processor that can solve difficult research problems, outperforming the largest computers in use today, at about one-tenth the cost.

Under DuBridge's successors—Harold

Brown, Marvin L. Goldberger, and Thomas E. Everhart—Caltech has continued to grow and develop and to contribute to science and engineering. Those contributions have received international recognition. Twenty-one Nobel Prizes have been awarded to Caltech alumni or faculty, and 21 faculty or alumni have received the National Medal of Science. Since 1958, 11 Caltech faculty members have been named California Scientist of the Year. The percentage of faculty who have been elected to the National Academy of Science and/or the National Academy of Engineering is at or near the highest of any educational institution in the country.

Another measure of change is that the campus has grown from its original 17 acres to 124, and from one building to 72. The original faculty numbered 16, and it now totals some 850. The endowment is currently over \$400 million. The number of students has increased from 35 to more than 1,800, nearly a thousand of whom are graduate students. Some 20 percent of those students are women. Research and education require teachers and support staff, of course, and Caltech and JPL now employ more than 7,000 men and women to perform those tasks.

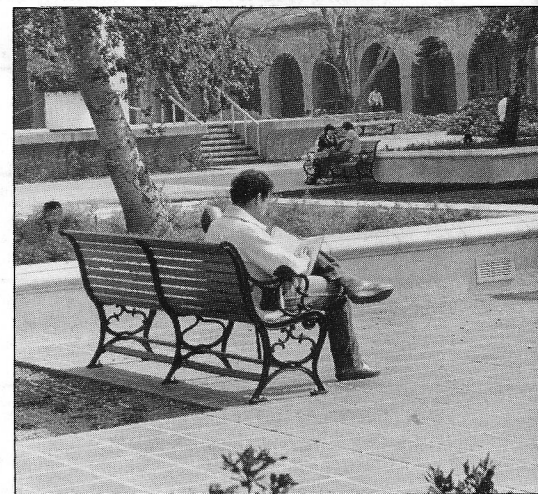
A sad event of 1971 was the San Fernando earthquake, which damaged Throop Hall so badly that it had to be demolished. Nothing like it could ever be built again, but its historic Calder Arches have been preserved on the facade of the Beckman Laboratory of Chemical Synthesis. The Institute also continues to add facilities for new scientific enterprises. Mauna Kea in Hawaii, for example, is currently the site for construction of the Keck Observatory, which will house the world's largest optical telescope. By 1989, Beckman Institute will be in operation on campus, focusing on interdisciplinary approaches to problems in biology and chemistry. It is hoped that what is learned there may eventually lead to clinical applications. Some of those applications may be achieved more easily because of the pioneering work done at Caltech in the creation of instruments for manipulating genes and proteins in increasingly sophisticated and labor- and time-saving ways.

Important as research is, it is only part of the Caltech story. Education of its highly intelligent and motivated students is also a prime focus. A recent innovation

is the interdisciplinary option in "Computation and Neural Systems," in which students study problems arising at the interface between neurobiology, electrical engineering, computer science, and physics. Another program is called SURF (Summer Undergraduate Research Fellowships). SURF brings students and faculty together each summer to develop student understanding and skills in professional-level research projects. An educational enterprise of a different sort—Caltech's two-part award-winning television series, "The Mechanical Universe"—has been shown widely on the PBS network. The series offers a one-year introduction to college-level physics.

This year marks the 100th anniversary of Pasadena's world-renowned Rose Parade, and Caltech has shared in them both directly and indirectly. Caltech students entered their first float in the parade in 1904 and their second and most recent in 1950. They have, however, made themselves felt in a series of card and scoreboard stunts at the Rose Bowl games, beginning in 1950 and most recently in 1984.

Two years ago, Pasadena celebrated its centennial, and Caltech helped mark the occasion by naming a newly discovered asteroid in honor of the city—*Asteroid Pasacentennium*. Three years from now Caltech will celebrate its own first century of achievement, and Pasadena will be invited to participate. Scientifically, "symbiosis" means the "living together in intimate association of two dissimilar organisms," and more generally it denotes a cooperative relationship between two groups. Both meanings apply to the relationship between Pasadena and Caltech. □



0000010

360 Olive Tree Lane
Sierra Madre
California 91024
U.S.A.
Aug.20, 1993

Dear Sir or Madam,

I am very, very disturbed and upset by the enclosed letter from you which constitutes mindless government harrassment of me. I have repeatedly responded to you letters regarding this vehicle and yet my responses seem to be completely ignored. What makes me particularly angry is that you should DEMAND an immediate reponse when you, yourself, have totally failed to respond to my communications.

Let me try one last time to get my message across to you. PLEASE LISTEN THIS TIME.

On approximately September 23, 1992, the vehicle in question, a Chevrolet Citation, license number 1CNT251, Vehicle Identification Number 1G1AX5854B6245086, had a major engine failure in a remote part of Baja California, Mexico. I gave the vehicle to a local farmer in exchange for some help to get back to a main road. The vehicle was worth negative dollars at that time.

Soon after my return to California, on Sept. 28, 1992, I filed the appropriate change of ownership forms with the DMV through the local AAA office here in Pasadena. Attached is a copy of that form.

Then in May of this year (1993), I received the first of the demanding letters from you. I immediately went back to the AAA office and showed them the letter from you. They again filed some form with you.

Now I get the enclosed threatening and harassing letter from you PLEASE cease your harrassment immediately. Or perhaps you could tell me what recourse I have in order to stop this mindless and thoughtless behaviour.

This time I expect a proper response.

Yours sincerely,

Christopher Brennen

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Dear Francisco,
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Please accept my sincerest apologies for not replying sooner to your most kind letter. The delay was partly due to my very busy schedule this year; I have just returned from Oxford but leave for Japan for 2 months in about 10 days. It was also partly due to the fact that I would have to leave my climb of Popocatepetl until next winter.

\bigskip
This coming summer Douglas Hart and I plan to climb Mount Rainier in the state of Washington, during which we will get training and experience with crampons, ice-axe, etc since Rainier is permanently covered with snow and ice. Douglas is a former student of mine who is now a young professor at MIT; he and I have climbed a number of mountains together including Caltech Peak, Mount Whitney and the highest mountain in Baja California, El Picacho del Diablo. He is an excellent climber and hiker; much stronger than I for I am quite slow (but sure).

\bigskip
Douglas and I had planned to climb Popocatepetl together and we would be very glad to join you or any of your friends for the climb. I would, of course, welcome any help from you in making the arrangements. It would be most enjoyable to form a group to attempt the climb and so we need to think about possible dates. Within the time frame Oct.- Feb. of next year, the best time for us would clearly be mid-December or very early January. I will consult with Douglas to find out what his preferences would be. Please let me know your thoughts. Looking forward to hearing from you,

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With best wishes,
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Christopher E.Brennen
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