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PLANETARY PHYSICS
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26 January 1977

Dr. Dale F. Leipper, Chairman
Department of Oceanography
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Monterey, California 93940

Dear Dale:

I am not sure I am altogether pleased that you wish to bring back to life your "Letters from Oceanographers." I don't want to be reminded that 19 years have elapsed since my last letter. Also, your list of correspondents is no longer as representative as it once was of "Who's Who in Oceanography." However, I imagine that the purpose of your request is not to find out what is happening in oceanography today, but rather to keep track of some old friends.

I seem to have stayed on the same course I have been on for so long, working at Scripps and enjoying it totally. As you know, we started a Geophysics Institute within the Scripps Institution about 15 years ago; and this is perhaps best known by its splendid architecture (here Judith deserves a great deal of the credit). We have been successful, and our Institute, which was not so long ago nothing more than a few sheets of paper in a few file cabinets, is now a known place over most of the world. We have a wonderful group of people here, and nobody wants to leave once they have come. I once discovered an Italian group theorist, whom I had told that a visit to our Institution would not be meaningful, sitting in a little cubicle just above the machine shop. His first words were, "I hope you don't throw me out; I came even though you told me not to."

Work has gone into different directions. For about ten years Frank Snodgrass and I pursued the measurement of deep-sea tides and their analysis, using Frank's freely dropped seafloor capsule. Then about three or four years ago, Gordon Williams and Jim Cairns adapted the capsule to midwater use, and this brought us into a very interesting era of internal wave measurements. I had fun working with Chris Garrett (now at Dalhousie) in synthesizing an empirical internal wave spectrum, which seems to fit a wide variety of observations.

Frank then decided to retire to farming in Oregon. He is now building a barn, and later will build a house. This was a major shock; I had been married to Frank longer than to Judith.

Anyway, we have kept on going, and my interests have been associated with propagation of sound in the ocean, particularly from the point of view of using this to monitor the ocean. We now have a very ambitious experiment planned for next year, which consists of sending sound pulses from mooring to mooring and using the variable travel time to monitor variable temperature and variable currents.

With best wishes,



Walter H. Munk

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INSTITUTE OF OCEANOGRAPHY

17 February 1977

Dear Friends,

When I received Dale's letter of 20 January 1977 I was intrigued at the idea of reviving the Letters but appalled at the thought of trying to summarize 19 years of my life in a few pages. However, on looking at my file I found that Dale must have lost a decade as my last copy of Letters is for 1967, so we have only to account for about 10 years, not go back to the 'Roots'. Then, in the hope that the following remarks will not be regarded as my definitive autobiography, here is an account of some experiences since the last Letters, starting with a few remarks about our group at UBC.

With 17 faculty and about 40 graduate students, we are small by SIO/WHOI etc standards but we have been able to produce a sizable fraction of the new oceanographers for Canada and some for other countries. We have continued to emphasize physics with about half of both faculty and students being in this field. For about ten years after our boost in size, the air/sea interaction studies under Bob Stewart and Ron Burling formed our main effort in physics but now we are looking more at the inshore zone and estuarine circulation. In 1970, most of us left the old huts and moved up to permanent building. It was with some sense of relief at the lesser fire hazard but with a little regret because much of our development had been associated with the temporary buildings. In fact we have held on to the huts as we still need the space. To the casual visitor, that is where we still are because at least we have our name there, whereas the University, for some reason, objects to putting names on permanent buildings.

My own work has continued to be directed mainly toward fjord estuary investigations, chiefly along the coast of British Columbia and Alaska, but with an excursion to the Chilean fjords from Punta Arenas to Puerto Montt in 1970 as part of the HUDSON 70 Around-the-Americas expedition. In addition I have had some acquaintance with the western equatorial Pacific, and the Coral Sea and Barrier Reef areas.

I have made three working visits to the ORSTOM group in New Caledonia to learn at first hand something of equatorial oceanography and that of the south-west Pacific. On my first visit in 1967, I was surprised to find how much data they had accumulated on the western equatorial Pacific, and I took part in one cruise of their long-term time-series transequatorial section studies. I like to think that my urging helped to start them publishing this material. Unfortunately that work is now suspended as they do not get much deep-sea ship time, the CORIOLIS having been pre-empted by other groups. However, when I left in May 1976 they were due to start an intensive study of the New Caledonia lagoon and reef system. This could provide some very valuable information because when I was reviewing the available physical oceanographic data on the Australian Great Barrier Reef lagoon I was surprised to find how little work appears to have been done on this and other coral reef lagoons.

25 minutes by electric train ~~away~~; both our two daughters live r
near-by, but the boys are rather far: Rodolfo in Brazil (Sao Pau-
lo and Minas Geraes) and Ronnie in the province of Corrientes
(North-east Argentina).

With best wishes,

Very sincerely,

Rodolfo

Henri Rotschi, who directed the oceanographers at Nouméa for so many years, was called back to Paris early in 1976 while I was there, with the prospect of being posted thereafter to Abidjan. He left with considerable regret. His Tahitian wife, Kere, and family were to follow later. She is as charming (and slim) as ever, and the children for whom I recall spending an afternoon drawing animals to order on the beach near their country cottage, are now grown and sophisticated.

With somewhat tenuous qualification, I got into the tsunami field as a Canadian representative on the ICG/TSU and its progenitor but I found the working meetings in the small groups associated with the coordination of the Tsunami Warning System in the Pacific very interesting. In fact, I find such small working meetings more to my taste nowadays than the big international ones where one is often spoiled for choice of sessions or frustrated because parallel sessions do not keep to schedule.

In August 1974 I went to Bangladesh to review and advise on a proposal to start an Institute of Oceanography at the University of Chittagong. The worst of the monsoon was over but the extent of the flooding from that exceptionally wet season was appalling. It was my first visit to the Indian Sub-continent area and I was most distressed at the evident general poverty. I was impressed by the enthusiasm of the faculty and students whom I met, especially the girls who evidently had a hard time breaking into that basically male system. I was depressed at the very limited equipment which they had and by stories from various sources of the great difficulties and delays in getting equipment and spares. I felt that I had to counsel a somewhat less ambitious approach for their Institute than they had suggested but personally did not feel optimistic about their being able to achieve even that. Sporadic correspondence since then has indicated that despite the very unfavourable economic situation in Bangladesh, some progress is being made toward establishment of the institute.

I noted that in his 1967 letter, Wayne Burt admitted to then being in the 'older generation' - in which are you now, Wayne? Bill Cameron and I can claim to have progressed further - we are now 'Pioneers of Physical Oceanography in Canada', duly elected to this position together with Jack Tully of the old POG, and Harry Hachey of the east coast, at a pleasant ceremony last November when we were presented with specially bound copies of the first all-physical oceanography issue of the Journal of the Fisheries Board of Canada assembled by my associate at UBC, Paul LeBlond. The organisers managed to get together about 150 of our colleagues from over the years and their wives, including Cliff Barnes and Waldo Lyon.

It is now fourteen years since I completed the first edition of my elementary Descriptive Physical Oceanography which had sold about 27,000 copies as of the last accounting at the end of 1975. For many years, I fielded questions about the proposed volume on Dynamic Oceanography promised by Ron Burling. Finally Steve Pond and I have decided that the time has come to do something and so we are well on with the manuscript for an Introductory Dynamic Oceanography which we hope will serve to initiate students into this subject, starting from scratch (except for a recommended preliminary reading in descriptive oceanography). We hope to have the manuscript to Pergamon by mid-1977 and then have it out fairly soon afterward as it will be prepared by photo-offset to speed production and, hopefully, keep the cost down.

Since 1961, when I used a meeting in Hawaii as an excuse to travel to Tahiti en route, my wife and I have become very attracted to the Pacific islands and their lagoons, and have travelled among them most years since then (nine transPacific trips, eight to Hawaii, five to Tahiti and visits to forty or more other islands). . I still feel that the Society Islands (outside Papeete) and the Tuamotus are the most attractive - I really prefer the low islands. For our last visit, while on sabbatical in 1975-76, we travelled east-about via some of the Indian Ocean islands (which I had not seen as I did not get on any IIOE cruises), and then by train across Australia and on to New Caledonia. (My first time in a train for about 20 years.)

Our main reason for liking the Pacific islands is because of the diving and snorkelling in the reef areas. Lillian's first acquaintance with snorkelling was at the end of our first Tahiti trip - I was then upbraided for not getting her into mask and fins earlier. How dedicated she now is may be judged from the fact that after she had a major brain operation for the removal of a (fortunately) benign tumor on 26 May 1973 she was snorkelling at Glover's Reef in the Caribbean exactly two months later.

One of our more interesting episodes in Pacific travel followed from a delay when Air Micronesia's pilot (!) went on strike. This left us on Yap for a few days extra (no strain) and enabled us to attend the high school graduation ceremonies, which were followed by an evening of dances by various Yap women's groups. Those of you who have been there will know why we found this interesting.

In 1968, at age 55, I got my private pilot licence and we still fly each weekend, though only VFR now as I have had to let my Instrument Rating lapse as I have not been able to put in enough time to get through the twice yearly check flight needed in Canada. It does make me realize that time is passing when I remember that the first aircraft in which I flew was too old to get into World War 2, and the first in which I handled the controls was a Fortress, of a generation of aircraft that most of my flying instructors had not even seen, let alone flown in. And then I remember that the first jet aircraft had not even been designed when I started my flight experience.

In the period since the last Letters our two children have obtained their Ph.D.s and settled to work and marriage (and out of the latter for one). Lillian formally retired from teaching at Crofton House School in June 1975 before we went off on my sabbatical, but seized an offer to return there part-time when we got back in 1976. For myself, my term as Director must end in June 1978 at latest, as I reach 65 early in July, though I expect to continue as professor for a time before retirement, perhaps then to bum around some of the less accessible areas in the Pacific with more time to spare.

Best regards to all,



George L. Pickard

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May 2, 1977

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Letters from Oceanographers

Dear friends,

Dale's letter requesting a revival of "Letters from Oceanographers" stated that it has been 19 years since the last letter. It doesn't seem that long ago - but probably like most of you, I have misplaced my file of old letters. Perhaps this is the right occasion to try to recollect the highlights for me and my family since the late 1950's, which might be of interest to you who shared common concerns back in the late 1940's at Scripps Institution.

As you may recall, I joined Dale's new Department of Oceanography and Meteorology at Texas A&M early in February 1951. Then Marjorie and I had two children born in California. In 1960, four more children later, I became full professor (otherwise I wouldn't have been able to support such a tribe!) I am now in my 27th year here and have seen a number of fellow oceanographers and meteorologists come and go -- both faculty and students. I have the dubious distinction of being the senior (in years of service) member of the department. If my tally is correct, I have guided 32 doctoral candidates and at least as many masters (of the doctoral: 7 in meteorology, 4 in ocean engineering, and the rest in oceanography). Eight of these are now in department head positions or comparable responsible positions. I have managed to dodge becoming department head on at least two occasions.

In the mid-1960's the Department of Oceanography and Meteorology became two separate departments and together with geography, geology and geophysics formed a new College of Geosciences with Horace Byers as its first dean. In 1973 the Departments of Oceanography and of Meteorology moved into the first high-rise on the campus (15 stories counting the radar tower and observatory); it says something of Texas A&M that this 9 mega-dollar building was paid for virtually in its entirety by the State, with only token federal support. There have been many changes on the campus and community. The University has grown four-fold in two decades.

In late 1969, I accepted the challenge offered by the American Meteorological Society to form a new journal to serve physical oceanography. I am now in my eighth year as editor of the *Journal of Physical Oceanography* and thanks to the help of a very efficient senior secretary, Florace Kling, am able to keep up with the ever-increasing volume of papers. This has been a rewarding experience in many respects.

I have been honored on three occasions with special awards: one by the Texas A&M University Alumni Association for research (1960); one by the Piper Foundation (1970) for teaching; and one by the American Meteorological Society (1974) in connection with *JPO*.

Like many of you, I have served on various panels or committees of the National Academy of Sciences and the National Science Foundation over the years; and also for the American Society of Civil Engineers and the Waterways Experiment Station, U.S. Army Corps of Engineers. I am currently active on an NAS panel concerned with Hurricane Surges and have just completed a three-year term as a member of the Council of the American Meteorological Society.

I have been fortunate to have attended several international meetings overseas (Wormley, 1957; Helsinki, 1960; Tokyo, 1964; Bern, 1967; Curaçao, 1969; Rome/Venice, 1972; Grenoble, 1975). Marjorie accompanied me on three of these trips (Bern, Curaçao and Rome/Venice). I missed one opportunity to attend the 1971 IUGG meetings in the USSR because of a conflict -- the wedding of my oldest son Rob to Pamela Theberge of Lewiston, Maine, whom he met while still in service with the U.S. Navy. The whole family motored in two separate vehicles to Maine that summer.

Rob, now 29, and Pam with daughter Kim (3 years this May) reside in Houston and are proud possessors of a new home mortgage after so many years in apartment living. He received his degree in architecture from the University of Texas in 1975 and has a position with an architectural firm in Houston, as well as doing free-lance architectural design work. Pam is a registered nurse and works in a small hospital in Houston. She has deliberately avoided the big medical center.

Nancy, our oldest daughter, has a degree in commercial art from Stephen F. Austin University, and is located in San Antonio where she has a position with the San Antonio branch of the University of Texas in medical illustrating. She is still single; the young men in that area must be blind!

Many of our children seem to have a flair for the arts. Carol, our next oldest, has real talents in both oils and water colors -- in contrast to Nancy who prefers pen and ink. Carol also does exquisite quilts. Her work has been shown in a few art exhibits in Texas; she received a blue ribbon for one of her water colors -- a winter farm scene conveying much of the technique of Andrew Wyeth. Carol was married in December 1975 to Ken McCormick and they are presently located in Seattle, barely making ends meet, but insisting on being independent.

Thomas, now 23, is the only really scientifically inclined one of our tribe. He had started at Texas A&M in physics and quickly gravitated into computer programming. It soon became apparent that he knew more about the subject than the instructors and he became bored with formal course work. For the last year or so he has been working full time in the Department of Oceanography as a computer programmer. He has also provided invaluable assistance to me on several consulting jobs, requiring extensive computing effort.

Russell, who will be 20 in July, is another one of our artists -- he prefers soft-shaded pencil sketches, particularly portraits. He is working part-time as a draftsman and does free lance art work (posters, etc.) for some of the stores in town. Some months he is even able to make his car payment! Rusty has long, red hair which, in times past, would be the envy of many a girl.

Finally, Maryellen, who is 18 'going on 25', is working as a clerk in a local bookstore making enough to meet her car payments but not quite enough to

keep her in the clothes she aspires to. She has a steady and marriage is foremost in her mind these days.

Marjorie has been active in church work, having served once as president of "Women of the Church" and as a member of the Vestry. For the last several years she has been in charge of altar flowers and flowers for special events. Both of us have served in the choir for a number of years. In her spare time Marj does a lot of knitting and novelty sewing -- Christmas stockings and Easter bunnies being a couple of her specialties. During the past several years Marj has been involved at least part-time and recently full time in real estate work -- up until last year in realty sales and more recently in property management.

We presently reside in a contemporary, two-story, brick and cedar home in the country about 7 or 8 miles from the University campus. We have six acres with stable and fenced pasture which Tom and I built two years ago for Carol's horse, before she sold it to go off to Seattle.

If you get by this way, be sure to look us up -- we have plenty of room for overnight guests (not counting the stable!).

Best regards.

Bob Reid