

6 January 1958

Dear Hank:

Just a note to let you know that I am working on the exchange. Gordon Groves is interested, but there are some other plans which make it impossible for him to make a firm commitment. I will certainly be in touch with you again.

With best wishes for 1958,

SCIENCE

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE
1515 MASSACHUSETTS AVENUE, NW, WASHINGTON 5, D.C. • DUPONT 7-7171

23 January 1958

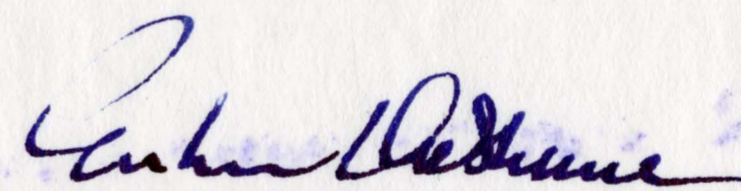
Dr. Walter H. Munk
Scripps Institution of Oceanography
University of California
La Jolla, California

Dear Dr. Munk:

I was sorry to learn from your letter of 21 January that you will be unable to undertake the preparation of an article for publication in Science. It was good of you to suggest that Dr. Stommel might prepare one for us, and I shall write to him today.

Thank you for your cooperation.

Sincerely,



Graham DuShane
Editor

GDuS:lg

February 12, 1958

Mr. Henry Stommel
Woods Hole Oceanographic Institution
Woods Hole, Mass.

Dear Hank:

I am awfully glad to be able to tell you that our invitation to you to come to Scripps next fall can be made as good as definite. Even if a suitable exchange can not be found, there is every reason to believe that funds will be available to take care of your expenses. Do count on it definitely, unless you want many of us to be very disappointed.

Bob Arthur showed me your Russian translations concerning dynamics of the ocean currents. I am impressed with the amount of work that has been done, as well as the simple and sophisticated style of the outline. I just don't see what Columbus means when he says, "Russian oceanography is twenty years behind the U.S."

Somewhere between the twentieth and the end of this month, I shall spend a week with Gordon MacDonald at M.I.T. Perhaps I will get to see you?

With best regards,

Walter H. Munk

WHM/lrn

cc: John Isaacs

Jean Collies

Chemistry

7 July 1958

MEMORANDUM

To: Admiral Wheelock, Chairman
Building and Space Assignment Committee

Subject: My request of June 2 for a cottage starting January 1, 1959
for 6 months on behalf of Henry Stommel

1. I transmitted to Mr. Stommel the decision made by your committee as shown in the minutes for the meeting of Friday, June 13, 1958. In these minutes I was asked to provide definite commitment.
2. Henry Stommel would appreciate it that this be made a definite commitment.
3. According to the minutes it was not yet definite as to whether Cottage 24 would rent unfurnished for \$60.00/month or furnished for \$100.00 a month. Mr. Stommel would much prefer the second alternative and writes "I'd be willing to pay the University a lot more rent than \$100/month if they could furnish it (just a stove, refrigerator, four beds, and a chair or two.)"

Walter H. Munk

WHM:es

June 26, 1958

Beth and Walter:

Thank you ever so much for all your efforts to get me a house and I hurry to assure you that we will be glad to accept cottage 24.. REPEAT, we will be glad to accept, - cottage 24 furniture or not. But I must say it is going to be a madhouse if we have to find beds etc. stove, regrid, etc. upon arrival. Let us pray that the University decides to furnish it. If they don't, then I guess we'll have to have a STOMMEL DAY where people with kind hearts loan us some old cots and pots. Anyway, Chick takes the whole thing as an adventure, so if we can safely pass through the critical period of consolidation there the first few days, we will have a grand time. Crockery, etc can all be bought at the 1/2 and 10, and we are counting on borrowing your old OLDSMOBILE Walter.

I'd be willing to pay the University a lot more rent than \$100/month if they could furnish it (just a stove, refrigerator, four beds, and a chair or two.)

Anyway, however, it goes, we all look forward to being with you to help start the New Year off right.

Walter

23 June 1958

Mr. Henry Stommel
Woods Hole Oceanographic Institution
Woods Hole, Massachusetts

Dear Hank:

I am on one of my weekly visits to La Jolla and find that there is hopeful news for getting you a house. The committee on space assignment has sent me the following:

"Request dated June 2, 1958 from Munk for a three bedroom furnished campus cottage for Henry Stommel, Woods Hole, for 6 months beginning 1 January 1959.

"After review of the cottage schedule, it was agreed to advise W. Munk that cottange 24 can be made available. It will have four bedrooms and two baths, including two bedrooms and one bath in the basemant. There is no no -- repeat -- no furniture. This includes no cooking stove and no refrigerator. The rent will be \$60/mo. unfurnished. When funds are made available to furnish cottage 24, as now intended, the rent will be \$100/mo. Advise W. Munk of the premise and ask him to get an expression of definite intention from Stommel."

Please write me back as soon as possible what I should tell them to do. Are you willing to take the cottage unfurnished? or furnished? My own advise would be to take it either way, but to express which you prefer. The rent is so much less that what it would be in La Jolla, that I think you could assemble the necessary beds, stoves, and refrigerator. I think possibly I will be able to dig up some of these for you. We have just bought an excellent refrigerator for \$12.00 (not new).

Yours,

Walter Munk

WHM:es

Minutes of the Buildings & Campus Development Space Assignment Panel Meeting

2:30 P.M. Friday, June 13, 1958 C. D. Wheelock's Office

Present: C. Eckart
H. Manard
J. Tyler
C. Wheelock

Not Present: M. Johnson
J. Kirby

Subject #1 - Expansion of office facilities to accommodate necessary increase in Controller's Office.

The earlier suggestion that Accounting occupy one of the campus cottages was vetoed for two reasons: (a) Mr. Kettler and Mr. Kirby agree that a wide physical separation between Accounting, Business and Administration would be unwise. (b) Eckart took a strong position in favor of keeping the cottages for living occupancy as long as possible as one inducement to be used for recruiting new staff.

It was decided to recommend to the Director the assignment of the Vaughn Hall Conference Room to the Accounting Officer on a temporary basis and until the Fall Academic Term or until such time as another suitable space can be assigned.

Before reaching this decision, the members present reviewed written statements dated December 11, 1957 and June 4, 1958 from Mr. Hinton in which he made pleas for return of the Conference Room space to the Aquarium-Museum activity whenever it could be released as a conference room. There was discussion of the utilization of the shop and specimen areas in the same general area and the Chairman was asked to study this situation before the next meeting and report on it.

Subject #2 - Cottage requests.

Request dated June 2, 1958 from Munk for a three bedroom furnished campus cottage for Henry Stommel, Woods Hole, for 6 months beginning 1 January 1959.

After review of the cottage schedule, it was agreed to advise W. Munk that cottage #24 can be made available. It will have four bedrooms and two baths, including two bedrooms and one bath in the basement. There is now no -- repeat -- no furniture. This includes no cooking stove and no refrigerator. The rent will be \$60.00/mo. unfurnished. When funds are made available to furnish cottage #24, as now intended, the rent will be \$100/mo. Advise W. Munk of the premise and ask him to get an expression of definite intention from Stommel.

Request dated June 11, 1958 from Warren Wooster for a cottage (preferably three bedrooms) for a period of six months so that he can finance and build a home on his SEA lot.

In view of the fact that Joe Curray is expected to vacate cottage #30 during August, 1958, it was agreed to recommend the assignment of cottage #30 to Wooster when it is vacated by Curray circa 20-31 August 1958 for a period of approximately six months.

C. D. Wheelock, Chairman
B&CD Space Assignment Panel

Assignments approved for the Director:

C. D. Wheelock

cc: Mr. Hinton
Mr. H. Johnson
Dr. Munk ✓
Dr. Wooster
Mr. Curray
Mr. Kirby
Director, SIO

MEMORANDUM

Could you offer any suggestions concerning a candidate for exchange with Woods Hole for 1958?

For some years now various Woods Holeans have spent a semester here and in return one of the Scrippsites went to Woods Hole. In general, the arrangement was made by trading houses, cars, etc. Gifford Ewing, Bob Arthur, and George Shor have been the previous staff members of Scripps Institution ^{who} ~~that~~ went to Woods Hole. We have had the visits of Fritz Fuglister, Alfred Redfield, and Rocky Miller.

I was happy to hear that Hank Stommel would like to spend a semester with us. The plans are flexible, but he is thinking of the winter of 1958. In the opinion of many of us, Hank Stommel is the outstanding physical oceanographer. Bob Arthur, Townsend Cromwell, John Knauss, June Pattullo, Doug Inman, myself, and many others will find his visit stimulating. Could you offer a suggestion as to who might go as an exchange for Hank?

Hank lives in Falmouth and has a wife and three children. It would make things easier if the person from Scripps has a family of the same order of magnitude.

Walter Munk

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Dennis!

Goldberg? Limbaugh?
Arkenius? Inman?
Brinton? Rudnick?
Bradshaw? Walker?
Cox?

Walter Munk

(W. H. MUNK)

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Hank lives in Falmouth and has a wife and three children. It would make things easier if the person from Scripps has a family of the same order of magnitude.

Walter:

Bob Fisher might possibly
be interested

PSa

Walter H. Munk

(W. H. MUNK)

WOODS HOLE OCEANOGRAPHIC INSTITUTION
WOODS HOLE, MASSACHUSETTS

Dear Walter

In the fat envelope I sent you to day, in my enthusiasm I think I made an error in the functional form of the Temperature Solution. The correst one is below.

$$T = [T_0 + T_{1y}] \exp \left\{ - \left[\frac{\alpha \beta g}{6K(\rho_0 + \beta y)^2} (T_0) \frac{1}{x} \right]^{1/3} z \right\}$$

The value of the vertical velocity just beneath the thermocline is given by

$$w(\text{thermocline}) = - (T_0 + T_{1y}) \left\{ \frac{4\alpha\beta g K^2}{3(\rho_0 + \beta y)^2 T_0^2} \frac{1}{x} \right\}^{1/3}$$

This solution of Robinson's is an approximate solution of the non-linear advective equation with all three advections terms taken into account.. and no basic stability fake trick like that used by Lineykin and by Veronis and me ~~involved~~. There is of course a linearization technique---but a pretty good one suggested by Carrier, so that the nonlinear features of the solution are preserved

Wank.

Dear Walter -

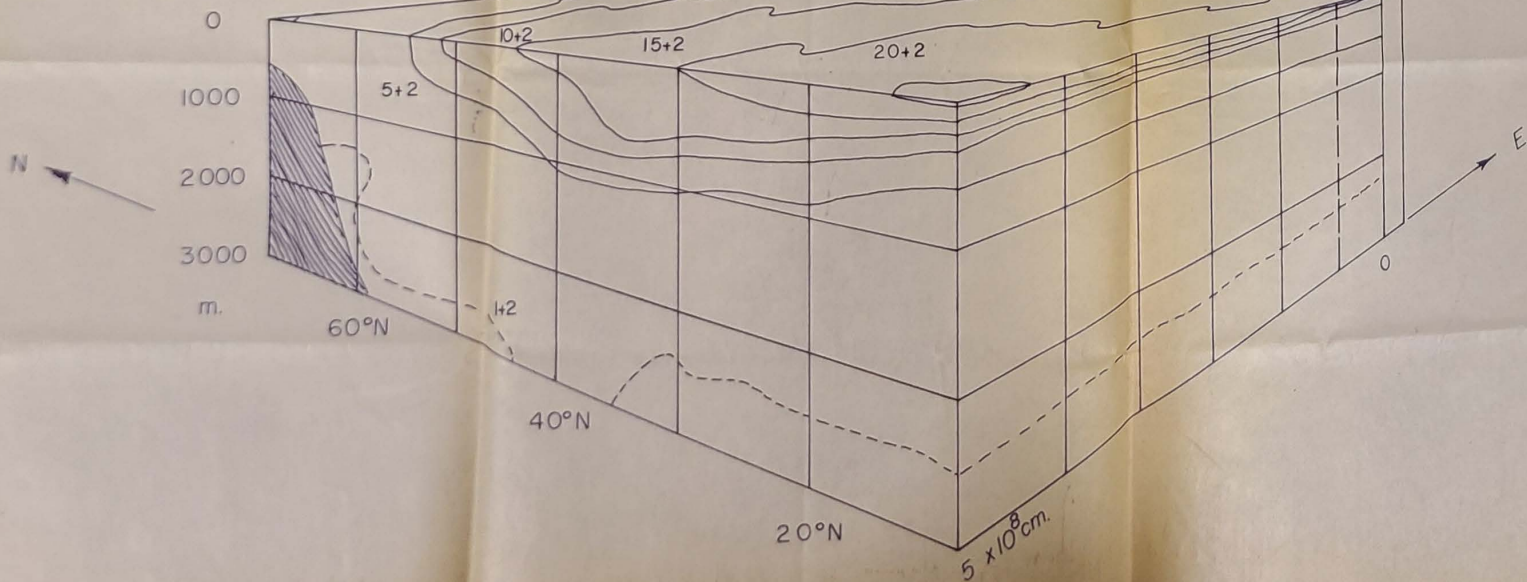
I can hardly restrain my enthusiasm for our latest picture of the Karmanian circulation. Allen Robinson has been able to make a 3-dimensional model of the density field on a ρ -plane (produced by a N-S temperature gradient) - the very thing we needed! He is a student of Carrier

So, my unpublished Karmanian manuscript has fallen on fertile ground - and a really good model [the vertical diffusion in the only parameter taken on a constant] \times This is easy to incorporate. And I can give a lecture or two on it in January, at Scripps.

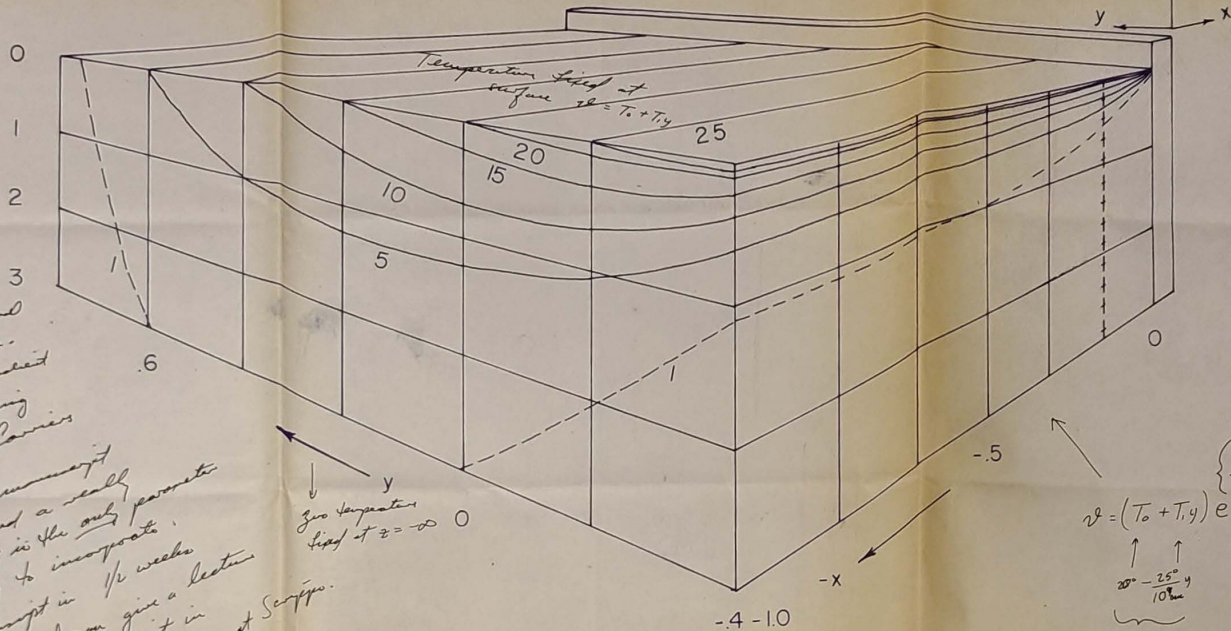
Wash.

Enoch!

North Atlantic for comparison.



Hz



Robinson Computed Density Field

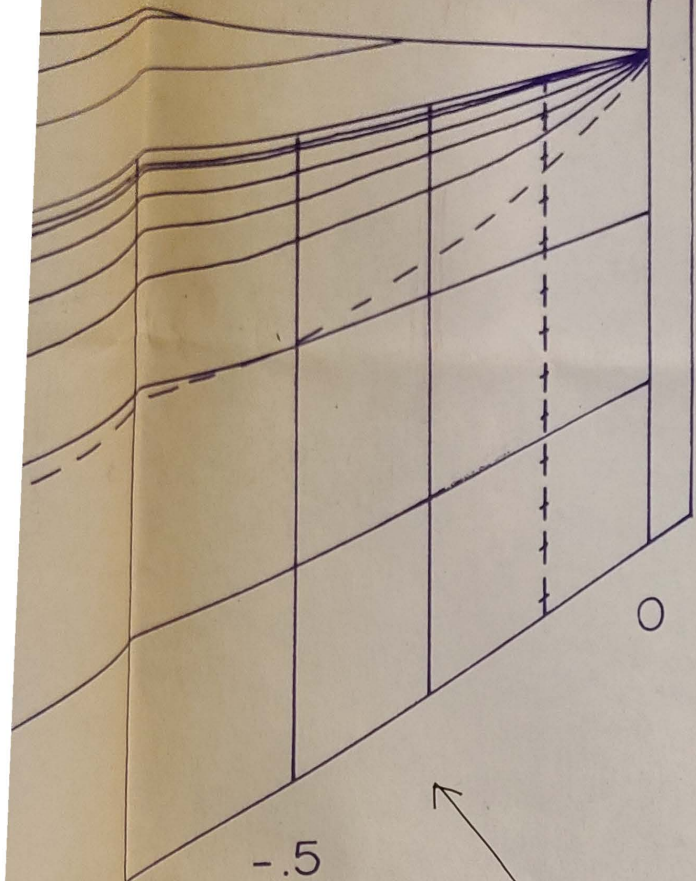
coeff of expansion

$$v = (T_0 + T_1 y) e^{-\left[\frac{\alpha \rho_0}{6K T_0} T_0 \frac{1}{x} \right]^{1/3} z}$$

\uparrow Surface Temperature
 \uparrow 20° - 25° y / 10km
 \uparrow coeff of expansion
 \uparrow coeff Carrier parameter at 30°N.

This is an appropriate form of an exact solution in $J_{1/3}^2 + J_{-1/3}$ function of imaginary argument.

Robinson's
Computed
Density
Field



coeff of expansion

-0.5

$$\left\{ - \left[\frac{\alpha \rho g}{6K f_0^2} T_0 \frac{1}{x} \right]^{1/3} z \right\}$$

$$v = (T_0 + T_1 y) e$$

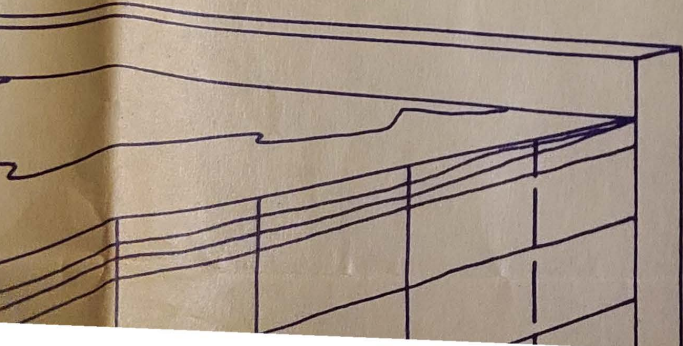
$$20^\circ - \frac{25^\circ}{10^9 \text{ km}} y$$

Surface
Temperature

eddy
coeff

Coriolis parameter at
30° N.

This is an approximate form of an exact solution in $J^{1/3} + J^{-1/3}$ functions of imaginary argument.



Hz

1

2

3

6

Dear Walter:-

I can hardly restrain my enthusiasm for our latest picture of the thermohaline circulation. Allan Robinson has been able to make a 3-dimensional model of the density field on a β -plane (produced by a N-S temperature gradient fixed at the surface) - the very thing we needed! He is a student of Carviers

So, my unpublished thermocline manuscript has fallen on fertile ground - and a really good model [the vertical diffusing is the only parameter - taken on a constant] ^{has evolved} which is easy to incorporate. And I can give a lecture or two on it in January, at Scripps.

Will send you the complete manuscript in 1/2 weeks.
Hauk.

Emile!

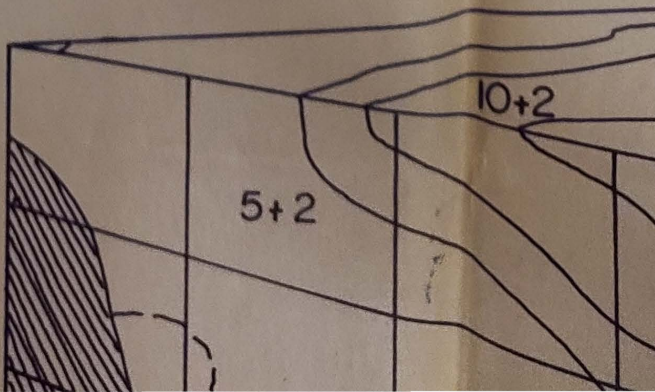
North Atlantic for comparison.

0

1000

2000

N



↓
zero temp
fixed at

September 30, 1958

VIA AIR MAIL

Mr. Henry Stommel
Woods Hole Oceanographic Institution
Woods Hole, Massachusetts

Dear Hank:

Your report on the solution to the thermohaline problem sounds exciting indeed. Would it be possible for you to come to this years meeting of the Institute of Geophysics, which is being held at La Jolla, and to report on the preliminary results? The dates are November 20 and 21. As you know, Malkus and Veronis are coming to speak about turbulence and convection. The theme of the meeting is on convection and turbulence and your work will fit into this very nicely.

If you can come, Hank, would you consider staying over for a number of days at La Jolla so that a small group of us might have a chance for a bull session? Following this, would you consider coming to UCLA and seeing some of your friends at the Institute of Geophysics here? I hope very much that you can come, and the fact that you are planning to be here next year should be no deterrent in making a quick trip at this time.

I plan to be in Woods Hole for a few days starting October 30th, at the invitation of Bill Van Art, and I hope very much to see you then.

We have been able to get together \$300 to cover whatever expenses you might have in coming on out.

Yours,

Walter Munk

WM:jb

WOODS HOLE OCEANOGRAPHIC INSTITUTION
WOODS HOLE, MASSACHUSETTS

Sept 30 plus 3, 1958

Dear Walter:

Thank you for your note. I think that the date of your conference is so close to the time that I will be coming out with family (Jan 1-3) that I had better let it pass by. Willy and George are throughly familiar with Robinsons mathematical treatment of the thermocline problem, and by the time they go out I will have the application (such as it is) to the real ocean pretty well worked out - numbers like transports, etc. Anyway, when you are in Woods Hole, in Oct, we can talk about it.

I am in the process of ordering airline tickets for the Spring of 1959 visit... and wonder, do you want to send me one of the U of Cal federal tax waivers for the purchase of tickets?

Yours truly,

Handwritten signature

Henry Stommel

ES file

October 13, 1958

Mr. Henry Stommel
Woods Hole Oceanographic Institution
Woods Hole, Massachusetts

Dear Hank:

Sorry you couldn't make it for the meeting but I appreciate the fact that you do not want to chase back and forth across the country.

Could you tell me what funds should be allotted to you so that your forthcoming visit at Scripps will in no ways work out to be a financial liability for yourself. I suggest that you consider separately your travel expenses and whatever pay scale you will want.

John Isaacs, who is going to meet these expenses from his Marine Life Research fund, will need this information to set up an account.

See you early next month.

Yours,

Walter Munk

WM:am
cc: J. Isaacs

ES file

October 13, 1958

Dr. Perry Byerly
Bacon Hall
University of California
Berkeley 4, California

Dear Perry:

Many thanks for your reminder of October 10.

When would you need the biography and bibliography
for Henry Stommel so that his name can be considered
at the next nomination?

Sincerely yours,

Walter Munk

WM:am

NATIONAL ACADEMY OF SCIENCES

SECTION OF GEOPHYSICS

PERRY BYERLY
BACON HALL
UNIVERSITY OF CALIFORNIA
BERKELEY 4, CALIFORNIA

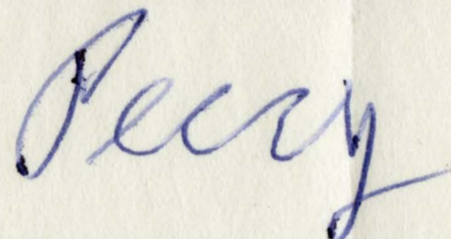
October 10, 1958

Dr. Walter H. Munk
Scripps Institution of
Oceanography
La Jolla, California

Dear Walter:

In preparing the Formal Ballots for the Academy, I have just looked over last year's Formal Ballot and note with some chagrin that you proposed the name Henry Stommel at the bottom of the Formal Ballot. I am sorry I didn't follow this up. I hope you will write his name in again this year. The others who nominated on the form followed it by a biography and a bibliography. I should have written to you last year asking for such; that is part of the job of the proposer. So this year perhaps you will do it and Stommel's name can appear.

Yours sincerely,



Chairman

PB:lm

Check

WOODS HOLE OCEANOGRAPHIC INSTITUTION
WOODS HOLE, MASSACHUSETTS

October 17, 1958

J. Isaacs &

Walter Munk

Scripps Institution of Oceanography
La Jolla California

Dear John and Walter:

Woods Hole will continue to pay my salary during the time I visit you. Therefore, I will need only air travel expenses, and a cost-of-living stipend to pay for the rental of the cottage.

Round trip airfare, 2 adults
and 3 children ages, 6,4,3 yrs
(less tax) \$1110.30; family plan

Note: I have made reservations on American Mercury 743, 9:45 ~~AM~~ AM Tuesday Jan 6, and they advise me to request you prepay tickets at San Diego

~~Rent for six months cottage~~

\$600.00

I would also like to add \$50/mo cost of living increase, because I cannot rent my Woods Hole house, and there will be extras with new housekeeping etc etc. But if you can't do this, forget it.

~~3600~~

300.00

Train fares Woods Hole-Boston etc.

30.00

Total:

\$ 930.00

Paul Howell

17 November 1958

Professor Perry Byerly
Bacon Hall
Section of Geophysics
University of California
Berkeley 4, California

Dear Perry:

Here is the dope on Hank Stommel. If I can do anything else to help, please let me know.

In case you are coming for the Institute meeting then I shall see you before this letter reaches you.

Sincerely yours,

Walter H. Munk

WHM:es
Enc.

NATIONAL ACADEMY OF SCIENCES

SECTION OF GEOPHYSICS

PERRY BYERLY
BACON HALL
UNIVERSITY OF CALIFORNIA
BERKELEY 4, CALIFORNIA

October 16, 1958

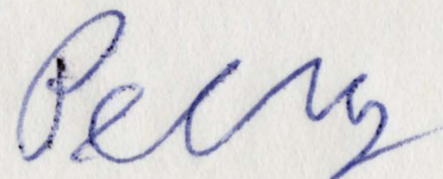
Professor Walter Munk
Scripps Institution of Oceanography
La Jolla, California

Dear Walter:

In answer to your letter of October 13, I
would like to have the biography and bibliography for
Stommel by June 1.

With best regards,

Yours sincerely,



Perry Byerly
Chairman

PB:lm

338 U. S. National Museum
Washington 25, D. C.

December 15, 1958

AIR MAIL

Prof. Walter Munk
Scripps Institution of Oceanography
La Jolla, California

Dear Dr. Munk:

This is simply to remind you that the Review Articles Committee of the Geological Society of America has you listed as a probable author of a paper to appear in its second Review Articles Number of the Bulletin in June 1960. Deadline on receipt of manuscripts for this second number is November 1959, and I hope very much that this will find you in a position to undertake such a commitment, for I know that the Committee would be proud to sponsor the publication of anything you may write.

The enclosed carbon copy of this letter is for your convenience in scribbling a confirmation or reply, and a provisional title.

Yours sincerely,

Preston E. Cloud, Jr.

Encl.

P.S.: I should tell you, if I haven't already, that the Committee will publish abstracts of all papers in Russian, German, and French, as well as in English. We can take care of this easily, but if you prefer to prepare your own, by all means do so.

PECloud:md

*Please let me first get our book
out, and then consider the
possible title.*

17 December 1958

Mr. Henry Stommel
Woods Hole Oceanographic Institution
Woods Hole, Massachusetts

Dear Hank:

I do want you to see this correspondence but would ask you to keep this in confidence that I have forwarded it to you. It would seem to me that if we should accomplish nothing else there might be some enhancement in the appreciation of good science.

I am certainly looking forward to seeing you.

Sincerely yours,

Walter H. Munk

WHM:es
Enc.

17 December 1958

Dr. Paul M. Fye
Woods Hole Oceanographic Institution
Woods Hole, Massachusetts

Dear Paul:

I do appreciate your letter, and it has caused us much concern and some loss of sleep. It seems to me that the position in Roger's letter is the best one can take. I shall be interested in your reaction.

The latter part of your letter concerns me personally. I consider my wartime work at Woods Hole one of the most exciting periods of my life, and I have a real love for Woods Hole which comes back whenever I visit. Judy and I enjoyed ourselves tremendously during our visit last month. Added to that is that I have neither the taste (nor perhaps the imagination) to look forward with pleasure to the pending explosion of the La Jolla campus. From this point of view I would find life in Woods Hole more attractive.

My professional position here couldn't be more desirable in the way of freedom and opportunity. I have a little empire of four, and a couple of students, which makes it possible for me to alternate between field work and theoretical work. Financial support has always been adequate, and I have no financial excuses not to have accomplished more. But perhaps the heart of the reason why I have never really considered going away from here has been my close personal relations to the last three directors, to Harald, Carl and Roger. It is a vital part of my life to have such a simple and frank understanding with Roger (whether we agree or not) and to be able to count on his loyalty.

These are all the facts, but not a clear decision, I am afraid. I am reminded of Rossby's dictum that one should change jobs and environment once a decade, but I am not in the mood for it. However, if I were ever to leave here there is nothing I would consider more attractive than the Harvard-Woods Hole combination.

Finally, may I add a personal note: much as I would like to see Hank and the Malkus's in the neighborhood, I really hope that conditions can be made so attractive that they will not leave Woods Hole.

Sincerely yours,

Walter H. Munk

WHM:es

cc: Henry Stommel (blind)

December 17, 1958

Dr. Paul M. Fye
Woods Hole Oceanographic Institution
Woods Hole, Massachusetts

Dear Paul:

Walter showed me your letter of 5 December, and we spent most of one night last week discussing the problems that are involved. These are difficult issues, and the reason I had not yet written to Hank and yourself is that I had failed to see them clearly.

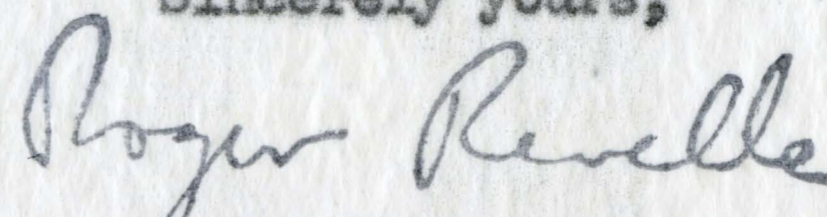
I am sure of one thing: it would be bad for everyone concerned if in the course of time any one institution in this country should ever become clearly dominant. The balance between WHOI and SIO is essential to the United States, and essential to both institutions.

Granting this, how should we proceed in the following situation? We are in urgent need of a physical oceanographer to guide our work in descriptive oceanography. A faculty position is open. In our opinion Hank Stommel is easily the best qualified man in the world to fill this position. We could proceed in two ways: (a) to offer the position to the man whom we consider to be the best qualified; or (b) to have a gentlemen's agreement between WHOI and SIO (and possibly other institutions) not to offer jobs to people within such institutions, and hence to look elsewhere.

It seems to me that the former alternative is preferable. Open competition for the best man would seem most likely to benefit the country as a whole. Nor does it seem fair that the most qualified person should not have the opportunity (by virtue of his excellence) to change positions if he so desires.

But one thing we must do (and can do) is openly to discuss these matters; I would like very much to get your reaction. It is good of you to have made it possible for Hank to visit us in 1959, and there is no formal connection between this visit and offering Hank a professorship.

Sincerely yours,



Roger R. Revelle

cc: W. H. Munk ✓

17 September 1959

Mr. Henry Stommel
Woods Hole Oceanographic Institution
Woods Hole, Massachusetts

Dear Hank:

We found a card file today marked Antarctic, Pacific, etc. and we suspect that these might be yours. I am sending them on to Woods Hole under separate cover. If they are not yours would you just throw them away.

Please tell Chickie that we are following up her suggestion about Kay.

Best regards,

Walter H. Munk

WHM:es

Dear Walter:-

I had thought that Chandler might have been an ancestor of one of my Boston acquaintances of that name, and wanted to get you some amusing biographical material on him.

It turned out that he was not related. However, out of curiosity I looked him up in the ~~the~~ Dictionary of American Biography and find that after all he was a professional astronomer for much of his life - and only during a 10 year period was employed in commerce - and that as an actuary for an insurance company - so I wonder if you ought to refer to him as a "merchant".

Let me thank you once again for the interesting

and pleasant time at Scripps. My contact
with Knauer, Arthur, and the Cromwell
Current has proved profitable, I think.
Various people here - Charney & Veronis - have
gotten excited by the Cromwell Current and
are working up some theoretical models.

My best wishes to Judy and Beth Strong.

Yours truly,

Hank.