

DEAN E. WOOLDRIDGE  
SUITE 511  
9229 SUNSET BOULEVARD  
LOS ANGELES 69, CALIFORNIA

20 April 1964

Dr. Jonas Salk,  
The Salk Institute for Biological Studies,  
P. O. Box 9499,  
San Diego, California 92109

Dear Dr. Salk:

Thank you for your friendly letter. I appreciate your interest and that of Dr. Szilard in my book.

I too shall look forward to some suitable future opportunity to learn more about your important activities.

Sincerely,

Dean E. Wooldridge.

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14 April 1964

Dr. Dean E. Wooldridge  
9229 Sunset Boulevard  
Suite 511  
Los Angeles 69  
California

Dear Doctor Wooldridge:

This is a small world, indeed. Within a few days after receiving your book--which I am very pleased to have, especially inscribed as it is--I was told by Leo Szilard not only that I must read your book which he had just found, but that I must make every effort to have you come down here for a visit.

I have had an opportunity thus far merely to thumb through what looks to be an exciting and enjoyable book and one that will give Szilard and me something to talk about at some length, especially since we are very serious about plans for developing activities at this Institute dealing with the brain and how it works. It was some remarks relative to our interests in this respect that prompted Admiral Horne to tell me about you and to offer to send a copy of your book.

I am delighted to have made the acquaintance of Admiral Horne, having known his sister-in-law, Mrs. Lloyd, I now hope you, too, may be able to pay us a visit, since you may be interested in knowing more about what we are trying to do. I trust this may be possible in the not too distant future.

Sincerely,

Jonas Salk

cc: C. F. Horne  
Mrs. Lloyd

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30 April, 1964

Dr. Dean E. Wooldridge  
Suite 511  
9229 Sunset Boulevard  
Los Angeles 69, California

Dear Dr. Wooldridge:

Congratulations to "The Machinery of the Brain" which I read with great pleasure. What impressed me most was the sense of proportions which is reflected in the balance of the book. I should be very much interested to learn whether you now intend to maintain your interest in this field for a while.

Enclosed is a preprint of a paper which will appear in the June issue of the Proceedings of the National Academy of Sciences. Because authors are limited to eight pages in any one issue of the Proceedings, this preprint is but the first of three instalments.

Had I merely postulated-- as others seem to have done --that if two neurons fire simultaneously, thereafter the synapse bridging these two neurons has a higher efficacy, then I would not be able to account even for Pavlov's experiments on the conditioned salivary reflex of the dog. As it is, it seems conceivable that-- in conjunction with neural networks as yet to be invented --the two fundamental postulates of my model might be able to account not only for the peculiarities of the conditioned reflex, but also for the higher mental functions. This could be true even if the details of the biochemical underpinnings of these two postulates should turn out to be incorrect.

Any comment which you might care to make would be appreciated.

Yours sincerely,

Leo Szilard

LS:jm

Enc.

DEAN E. WOOLDRIDGE  
SUITE 511  
9229 SUNSET BOULEVARD  
LOS ANGELES 69, CALIFORNIA

5 May 1964

Dr. Leo Szilard,  
The Salk Institute for Biological Studies,  
P. O. Box 9499,  
San Diego, California 92109

Dear Dr. Szilard:

I appreciate your friendly comments about my book. Evidence that it is favorably received by one with your background of outstanding accomplishment in the physical sciences is most gratifying to me.

I have this morning read, with great interest, the preprint you sent me. While the time I was able to devote to the task did not suffice to permit me to say, honestly, that I understand in detail your example of conditioning, I think I comprehend your postulates and have a bit of a feel for the possibilities they open up. Frankly, your approach seems much more likely to me than that taken by so many physical scientists nowadays, in which the attempt is made to account for memory on the basis of specific coding of the macromolecules of RNA or DNA. It seems to me that your concept of specific membrane proteins, with its analogy to the antigen/antibody situation, possesses a considerable degree of a priori reasonableness. And I should think that it is compatible with the evidence that learning is accompanied by RNA generation in the brain cells. After all, when one of your memory neurons is "trans-printed," considerable protein-generation must occur. The relationship between RNA and protein-generation is well-known; therefore your theory would appear to provide a nice correlation with the RNA observations, without requiring the (to me, at least) very questionable assumption that acquired and genetic memory employ basically the same physical processes. I am also impressed by the ability of your theory to account for stimu-

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lus generalization and also to permit the ultimate response sensitivity of a neuron to be determined by the past history of events at each of its many somatic or dendritic inputs.

I would greatly appreciate it if you would put me on your mailing list for preprints of the remaining two parts of your article.

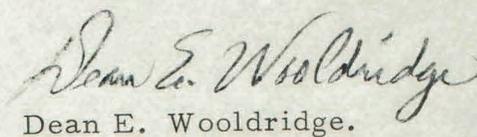
You inquired about my future interest in this field. I have an interest, and it is closely related to the sort of thing you are doing. I should like to write a second book about the brain, in the next three or four years. This book would be much more advanced than the first--it would, in fact, be devoted to an exposition of possible theories of higher brain function, such as you appear to be in the process of developing. I have the feeling that the time is ripe for such as you to work out thoroughly plausible possibilities as to how the "higher intellectual processes" might be conducted, employing hypotheses that are entirely consistent with what is known about the anatomy and physiology of the brain. I am impressed with how little of this sort of thing has been done, in view of what seems to me to be the possibilities. To be sure, the state of the art does not permit anyone to set down a set of hypotheses that he can be sure are correct, but at any rate I should think that some one should at least go through the exercise of showing that adequate theories are possible, without doing violence to what is known. I find your work most encouraging, for it seems to confirm my judgment that the field is ripe for the sort of thing I am talking about, and that in only a few years there will exist suitable subject matter for my planned review.

Meanwhile, although I read an occasional paper and try not to get too rusty in these matters, my time is largely occupied with other projects, and will be for the next year. However, my level of interest remains

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high, despite the inadequacy of my intelligence on the field. If you should ever find yourself in the Los Angeles area around noontime, with no one to buy your lunch, I'd enjoy hearing from you. I can't promise you a stimulating conversation, but I think I can guarantee you a good listener.

Sincerely,

A handwritten signature in cursive script that reads "Dean E. Wooldridge". The signature is written in dark ink and is positioned above the printed name.

Dean E. Wooldridge.

May 8, 1964

Dr. Dean E. Wooldridge  
Suite 511  
9229 Sunset Boulevard  
Los Angeles 69, Calif.

Dear Dr. Wooldridge:

Many thanks for your very kind letter of May 5. I am very grateful to you for offering to listen to what I may have to say; there seems to be nobody here at present, either at the Institute or at The University of California, who is seriously interested in the Central Nervous System. I would telephone you in order to set up a luncheon date which is convenient to you. Presumably your telephone number is listed and the operator could get it through "Information", if I were to call from La Jolla.

Should you by any chance visit La Jolla before I get to Los Angeles, I hope you will call me over the telephone, a day or so ahead, either at The Institute (453-4100), or at my residence, which can be reached through the switchboard of the Hotel Del Charro (454-6134).

There is one issue on which I would particularly need your guidance. I should like to explore the possibility of building an electronic model for the conditioning of the salivary response of the dog which would involve the congenital concept "food", or perhaps a somewhat more general model for concept formation, which would involve a non-congenital concept of the kind which a child forms when it learns the correct usage of a word that designates a concrete object.

I have some notions of how this could be done by sacrificing speed, but my notions might be quite wrong.

I know next to nothing about electronics and would, therefore, greatly benefit from having extended conversations, for a few days or weeks, with some young man

Dr. Dean E. Wooldridge

May 8, 1964

who knows something about computer elements and has a certain amount of imagination.

\* \* \*

Let me now turn to another subject. A thought has crossed my mind which I want to mention to you in order to find out whether I ought to pursue it any further. Not long ago we had a visit from Dr. Robert A. Aldrich, Director of the National Institute of Child and Human Development. He is in the process of formulating in his mind on just how his Institute ought to be set up. When he visited us he talked about the possibility that - in addition to having some research operation in Bethesda - his Institute might set up, within the framework of different institutions, laboratories which would be under the joint control of his Institute and the local institution.

These laboratories would not be operated under a grant, rather their budget would be part of the budget of NIH. The details of how such a dual control could be operated without undue friction have apparently not been worked out, nor was Dr. Aldrich certain whether, if he were clear in his own mind on just how he would want to carry out such intramural research, on an extramural basis, his plan would be approved by the administration of NIH and the relevant congressional committees.

It seems to me that the possibilities outlined to us by Dr. Aldrich ought to be explored at this time and the thought crossed my mind that perhaps you could be interested in heading up a major operation on the functioning of the Central Nervous System under the dual control of the NIH and the Salk Institute. If you were willing to consider this then I would want to arrange, first of all, for you informally to meet with Dr. Salk and some of the Resident Fellows of the Salk Institute. If we were then to come up with something that would seem to make sense, both from the point of view of the Salk Institute and from your point of view, then we could help Dr. Aldrich to crystallize his own thinking by putting forward a concrete proposal.

In this context I should add the following: The building housing the North Laboratory and the building housing the South Laboratory should both be completed by February 15 of next year. It will take another four million dollars (out of which

Dr. Dean E. Wooldridge

May 8, 1964

three million dollars would still have to be raised) to complete, furnish and equip the North Laboratory which will have about 50,000 square feet of net laboratory space.

It would take about five million dollars (all of which would still have to be raised) to complete, furnish and equip the South Laboratory, which will provide for another 50,000 square feet of net usable laboratory space.

One might conceivably set aside between 5,000 and 25,000 square feet, either in the North Laboratory or in the South Laboratory for a research operation centering on the Central Nervous System.

I could explain when I see you why I believe that it would make sense for someone of your bent of mind to be in charge of an operation of this kind, and why it might be possible to gather in such an enterprise able people who might successfully tackle the problems involved.

It is not clear to me from your letter whether your time will be largely occupied by your current projects just throughout the rest of this year, or whether it will be so occupied also through the year 1965. Neither of these two alternatives would need, however, to rule out your participation in the project I outlined above, since it would take considerable time to set up *this project in any case* ~~such an operation outlined above.~~

At the University of California, and at its Medical School, which is now being built, there is also an increasing interest in setting up a major research operation in Experimental Psychology and in Neuro-Biology, respectively. More about this if I see you.

Sincerely,

Leo Szilard

LS:jm

DEAN E. WOOLDRIDGE  
SUITE 511  
9229 SUNSET BOULEVARD  
LOS ANGELES 69, CALIFORNIA  
13 May 1964

Dr. Leo Szilard,  
The Salk Institute for Biological Studies,  
P. O. Box 9499,  
San Diego, California 92109

Dear Dr. Szilard:

Your letter of May 8th was a meaty one. Let me comment on the points you raised, in inverse order to that in which you set them down.

First, the NIH matter--Dr. Aldrich's idea of an extramural intramural establishment is a most interesting one, although I would imagine, as you have also suggested, that there would be many high hurdles for him to get over before he succeeded in getting it set up. My interest in this kind of thing is at least temporarily higher than it would normally be, for I am currently engaged in some committee work for the Office of Science and Technology, in which our assignment is to look into and report on the activities of NIH. However, to get on to your principle question, I fear you will have to count me out of any plans for personal affiliation with such an activity. This sort of thing just does not fit in with the way I plan to spend my time, as I will be glad to explain when we meet. I won't even comment on the impossible chore you would have to try to convince anyone else that I would be suitable for the job, if I were available. The suggestion is most flattering to me, of course. I shall be interested in how you rationalize it, if we ever get time to talk about academic points.

Now, as to your idea of an electronic model-- You mustn't expect direct assistance from me, for I am certainly not a computer expert. However, I may be able to develop a suggestion or two regarding some- one you could talk to who would provide the kind of

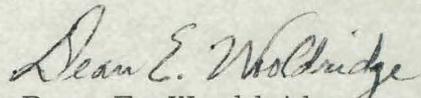
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input you need.

Finally, the one point on which I can be completely responsive is your suggestion that we meet and talk. That I can do--although here again all you should really expect from me is a fairly good listener. However, it is possible that I could give you some kind of impedance to work into in a conversation about your project interests. Whether my impedance would properly match yours can only be determined by trying it, I suspect. At any rate, I should be happy to meet you whenever you can find yourself in this area. My phone numbers are: Office--CR1-1801; Home--GR2-2272.

I shall look forward to making your acquaintance.

Sincerely,

  
Dean E. Wooldridge.

14 May, 1964

Dr. Dean E. Wooldridge  
Suite 511  
9229 Sunset Boulevard  
Los Angeles, Calif.

Dear Dr. Wooldridge:

Many thanks for your very clear letter of May 13.

The questions which it raises can wait until we have a chance to meet.

When I wrote that "I would greatly benefit from having extended conversations with a young man who knows something about computer elements and has a certain amount of imagination" I had in mind some young man whom you might know and might recommend. This is not a matter of urgency, however, and it too can well wait until we meet.

Sincerely,

Leo Szilard

LS:jm

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May 19, 1964

Dr. Dean E. Wooldridge  
Suite 511  
9229 Sunset Boulevard  
Los Angeles 69, Calif.

Dear Dr. Wooldridge:

Enclosed I am sending you a copy of my little book which might perhaps amuse you.

With best wishes,

Yours sincerely,

Leo Szilard

LS:jm

Enclosure

DEAN E. WOOLDRIDGE  
SUITE 511  
9229 SUNSET BOULEVARD  
LOS ANGELES 69, CALIFORNIA

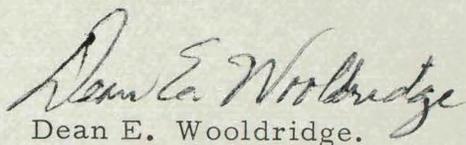
25 May 1964

Dr. Leo Szilard,  
The Salk Institute for Biological Studies,  
P. O. Box 9499,  
San Diego, California 92109

Dear Dr. Szilard:

I read your book, and enjoyed it, a year or so ago. However, I then lent it to someone else, and it permanently disappeared. I am happy to have the new copy. Thanks.

Sincerely,

  
Dean E. Wooldridge.