

c/o Clarendon Laboratory,
Parks Road,
Oxford.

19th March, 1936.

Dear Segrè,

I was very pleased to see Giannini about whom you wrote to me and I believe that his co-operation might be of very great value at some later date. For the present I am inclined to think that the manufacturing of radio-active elements would be somewhat premature.

It is quite conceivable, however, that nuclear physics will find important applications in a not too distant future and we may as well make up our minds now whether we ought to keep aloof or whether we are to take out patents now and, if so, to what use they ought to be put.

I feel that I ought not to consider any patents in the field of nuclear physics as my private property and that, if important applications become possible, such patents should be used along the lines indicated in my letter to Fermi, of which I sent you a copy. If possible, they should be administered by the same men who made the discoveries to which the patents relate. ~~On the other hand~~ ~~if the possible applications are not sufficiently important~~ If, however, the applications are not sufficiently important to bother about the administration of such patents, we may as well withdraw them, rather than have them float about.

Here are a few comments on a question of principle on which we ought to make up our minds. The patent law in its present form make it possible to practise piracy of the worst kind. Let me illustrate this with my patent of March 12th, 1934, which protects the generation of radio-active elements by neutrons, i.e., the Fermi effect. The patent law does not require that one/perform^{should} an experiment and demonstrate the effect before applying for a patent. All it requires is that one should describe a process and state that it is workable; obviously it invites to piracy and this particular

patent is a clean cut example of it.

But even if I had actually performed the experiment and discovered the Fermi effect - which I certainly did not do - I should still feel unable to consider this patent as my private property. It may make some difference, but hardly a very big one, whether we take out a patent for the future discoveries of others or for the past discoveries of our own. As long as we take out patents at all, we may as well play the game according to its rules and formulate the patent to include everything that anybody may discover in the next hundred years.

c/o Clarendon Laboratory,
Parks Road,
Oxford.

30th March, 1936.

Dear Segrè,

Many thanks for your letter. If you are now going to discuss the question of taking out patents in the field of nuclear physics with the others, would you kindly convey to them some general and ^{some more} personal remarks of mine on this subject?

1) If a body were to exist which we could trust to administer such patents in the public interest and to use the income which may be derived from them for the promoting of further research, we could all hand over our patents to such a body and remain more or less aloof. Such a body might then grant non-exclusive rights for the use of such patents to manufacturers under the condition that they contribute to a fund which is used for promoting further research and on the further condition that the manufacturer does not block the way for others by patents of his own. The funds provided in this way could be used for setting up systematic investigations which fit in well with the work already in progress in university laboratories, but which may have a more direct ~~application~~ bearing on practical applications. The results of such investigations ought to be automatically available to all manufacturers who contributed their share to such a research fund.

For example, if such a fund existed, it could now be used for the hiring of radium (mixed with beryllium) for use in laboratories which are badly off in this respect. With a view to medical applications, a systematic investigation of long half-life periods and gamma-ray emission could be started in some laboratory where it fits in well with the work already in progress etc. etc.

2) No such body at present exists in Europe, though ^{on} the American Research Corporation is based ~~on~~ more or less ~~on~~ similar ideas.

Since we are not certain that important applications of our patents at present exist and that funds will shortly be forthcoming, we cannot very well take steps to create such a body. We could, however, in the assumption that such important applications will arise later, ask two of such men like Chadwick, Cockroft or Fermi to act as trustees in this matter, jointly to decide about these patents if any decision is required and jointly to decide about the use of funds for further research if any funds are forthcoming.

3) I am unable to consider the patents which I have taken out as anything but public property. The only right way for me to deal with them therefore is to hand over the responsibility for whatever happens to them in future to those on whose preceding discoveries these patents are based or whose subsequent discoveries the patents anticipated.

This was my intention right from the beginning when I applied for these patents between March and September 1934 and my chief motive was not so much the idea that these patents should be used for raising funds for research purposes, as the belief that in case of revolutionary applications of nuclear physics an attempt should be made to exercise some measure of control by disinterested scientists.

It is quite obvious that we cannot consider such patents as my private property. The one contribution which is made towards practical applications is the method for the chemical concentration of radio-active isotopes. The rest of the patents is based on preceding discoveries of others or is foreshadowing subsequent discoveries of others. It is impossible to think of any practical application which would not make use of discoveries of physicists who publish their results, but who did not wish to patent them and in these circumstances it is out of the question for me to derive any privileges from the small contribution which I may consider is really mine and the only proper course is to hand over the control of the patents to some persons who might claim the right and to whom

we may impute the duty to take control in such matters.

Unfortunately I am in the meantime in the uncomfortable position of a man who during a fire (either real or existent perhaps only in his imagination) tries to remove some jewellery which does not belong to him to some place of safety. Some passers-by who meet him in the street with the jewellery in his hands must inevitably take him for a thief, even if they are too well-bred to say so. While I am quite prepared to face this if/ necessary, you will appreciate that I should like to get out of this situation as quickly as possible.

x (R-V)

c/o Clarendon Laboratory,
Parks Road,
Oxford.

1st April, 1936.

Dear Segrè,

Many thanks for your letter of March 21st. Please let me know when you reach a decision in Rome about the question of "patents". Could you please convey to the others some of the following points of view and suggestions which I am tentatively putting forward. Perhaps you could bear them in mind when you are discussing this thing in Rome at Easter.

Point 1. Let us first envisage the possibility that practical applications in the field of nuclear physics will become so important that an attempt to exercise some measure of control over them through disinterested scientists will appear to be justified. In order to achieve this, some sort of association could then be brought into existence to which we could all hand over our patents, so that most of us should be able to remain more or less aloof.

Such an association need not follow the example of the Research Corporation (New York) by mixing manufacturing activities and the promotion of science. It could confine its activities to bringing about a co-operation between industry and scientific research along the following lines:

The association could grant non-exclusive rights for the use of its patents to manufacturers under the condition that they contribute to a fund which is used for promoting further research and on the further condition that the manufacturer does not block the way for others by patents of his own. The funds which are available could be used for carrying out systematic investigations in University laboratories which fit in well with the work already carried on in such laboratories. The results of such investigations ought to be

automatically available to all industrialists who contribute their share to the research fund of the association. Perhaps it is possible to avert in this way competitive research into nuclear physics in industrial laboratories.

2. It may very well be that no important applications of nuclear physics may arise and in this case none of us will be willing to take much trouble about these patents. Unless, however, we are willing to take the trouble involved in their proper administration and in the proper administration of the funds which would be forthcoming, I for my part would rather withdraw the patents which I have taken out, than let them float about in an irresponsible way.

At present we do not know whether or not the practical applications will be sufficiently important for us to go out of our way and exercise some sort of control over the patents. The question therefore arises what should be done until we can decide about the proper course of action.

It seems to me that in the meantime we could ask some men like Chadwick, Cockroft or Fermi, or at least two of them, to accept the responsibility for whatever action is in the meantime required and jointly to decide each issue which arises.

If we think that it is justified to raise funds for further research we may attempt to do so and I have been in touch with some private persons who may or may not be willing to contribute towards such a fund. In my personal opinion we might feel justified in suggesting that a fund of £5,000 should be created and that this fund should be spent on research in the course of the next three years. It should be used to carry out investigations which fit in well with our present work, but which have a more direct bearing on possible practical applications. There are three main ways in which such a fund could be used for the present:

- a) For hiring radium and providing certain laboratories which are badly off in this respect with steady

sources of neutrons (radium properly mixed with beryllium).

- b) For salaries of young physicists who could carry out certain systematic measurements in one of the laboratories in which such work is already in progress.
- c) For enabling any of us to move from one laboratory to another if this is justified from the point of view of apparatus which is present in one laboratory, lacking in the other and needed for the particular experiments which now appear to be of interest.

when you see him in Rome

Please ask Fermi/to let me know if he would care to share the responsibility for the decisions which may now be required until we either withdraw the patents or find some definite form for their administration.

The question of the patents for which you are no longer free is hardly of primary importance. We ought, however, to bear in mind that it must be awkward for any scientist to have a personal income from such patents, while other scientists, who also could have taken out such patents, refrain from doing so. It is not customary to take out patents on scientific discoveries and it is hardly desirable to act against such an unwritten law unless one has reason to think that a departure is justified by unique circumstances.

Naturally, customs are different in different countries and you have at any rate really discovered something, while I have mostly taken out patents on subsequent discoveries of other people. Our cases are different, and I ~~am very sure~~ ^{however} do not think it right for me to have any financial advantages or any other privileges through patents which are connected with nuclear physics.

Please give my kind regards to all and thank your wife for her excellent German typing.

Yours sincerely,

(LEO SZILARD)

c/o Clarendon Laboratory
Parks Road
O x f o r d

30th January 1937

Dear Segrè,

I have not heard from you for a long time. How are you, and how is your work? Enclosed I am sending you a M.S. which will appear in "Nature". I also wanted to tell you that I have been approached about the patent which we discussed some time ago, and that I **have** signed an agreement but have reserved the right to give the right to manufacture in cases in which Fermi or ~~and~~ certain other physicists who work in the field of nuclear physics are of the opinion that such rights ought to be granted; the chemical separation of the radioactive elements from their irradiated isotopes is however for the present excepted from this reservation. Perhaps you could inform Fermi and Giannini if you think that they ought to be informed. I saw Giannini last year in April, I believe, but I have not heard from him for a long time and I do not seem to have his address.

With kindest regards,

Yours,



ISTITUTO FISICO

F 53 x
Palermo, 5/3/36
Via Archirafi

Mein lieber Szil~~ard~~,

ich schreibe Ihnen auf Antrag des
Herrn Dr. G. M. Giannini.

Er hat mit mir und Amaldi in Rom stu-
diert und er interessiert sich fuer Neu-
tronen, nicht vom wissenschaftlichen Stand-
punkt aus sondern fuer deren praktische
Anwendung. Da er Sie wahrscheinlich be-
suchen wird, wollte er nicht als ein ganz
Unbekannter vor Sie treten.

Von hier aus habe ich nichts Beson-
deres von physikalischer Bedeutung zu
berichten, gruesse Sie aber herzlichst.

Ihr
Enrico Segre.

Letter by Segre recommending
Giannini who is interested
in discussing patents
with L. S.

E. SEGRÈ
36 CREST ROAD
LAFAYETTE, CALIFORNIA

8 II 60

Dear Izolard:

I was distressed in learning of your illness and I want to send you my best wishes.

I have not seen you for some time, but I have never forgotten our interesting conversations over the years.

Yours ever
Enrico Segre

DUDA

E. BERRY
21 WEST ROAD
LAUREL, CALIFORNIA

IBM

Dear Leonard:

I was disturbed in learning of
your illness and I want to
send you my best wishes.

I have not seen you for some
time, but I have never forgot-
ten our interesting conversations
over the years.

Yours ever
E. Berry

UNIVERSITY OF CALIFORNIA

DEPARTMENT OF PHYSICS
BERKELEY 4, CALIFORNIA

May 10, 1961

Dr. Leo Szilard
Hotel Dupont Plaza
Washington 6, D.C.

Dear Szilard,

I have received "The Voice of the Dolphins" and I have read the whole book from beginning to end with very great interest and amusement. I had finished reading it yesterday and, on driving home in my car, I heard your voice over the radio commenting on it. This gave me additional pleasure.

I hope "The Voice of the Dolphins" will be extensively read because it seems to me that it contains a good amount of wisdom under its funny cover.

I hope your health is holding up. With my very best wishes,

Sincerely yours,


Emilio Segrè

ES:rs

V-64

UNIVERSITY OF CALIFORNIA

DEPARTMENT OF PHYSICS
BERKELEY 4, CALIFORNIA

June 22, 1961

Dr. Leo Szilard
Dupont Plaza Hotel
Washington, D.C.

Dear Leo,

As you probably know the Accademia dei Lincei and Chicago University Press are publishing the COLLECTED PAPERS OF FERMI. The work will be comprised of two volumes, one referring to the Italian period and one to the American period. Volume I is an advanced state of printing and I hope that it will soon be available.

I am chairman of the Editorial Committee.

It has been decided to have a short historical introduction to each paper, setting forth the circumstances under which it was written and the history of the particular investigation. We want these introductions written by the best qualified people, i.e., by the co-authors of the papers.

I would appreciate it very much if you would write the introduction to "Neutron Production and Absorption in Uranium", Phys. Rev. 56, 284 (1939).

The deadline for this work is August 15, 1961. Please let me know whether you are willing to do this work and meet the deadline.

Sincerely yours,


Emilio Segrè

ES:rs

*arrangement
negotiated.*

Emilio Segre to L.S. March 21, 1936

Replies to Letter from L.S. re: proposed funds for scientific exploration of slow Neutrons by a group of scientists, - Wants L.S. to explore opportunities for him in Columbia



Palermo, 21/3/36
Via Archirafi

ISTITUTO FISICO

Mein lieber Szilard,

ich schreibe Ihnen deutsch,
weil meine Sekretärin = Frau
besser deutsch als englisch schreibt.
Ich habe mit grossem Interesse
Ihren Brief gelesen. Natürlich
kann ich Ihnen nicht fuer alle
antworten, da ich mit den anderen
noch nicht gesprochen habe. Zu
Ostern bin ich in Rom und wir wer=
den dann ueber Ihren Brief spre=
chen. Ich bin im grossen und ganzen
mit vielen Ihrer Ideen einverstan=
den, besonders damit, einen Fond zu
suchen, um die Untersuchung ueber
die langsamen Neutronen fortzu=
setzen. Auch die Hoehe der von
Ihnen vorgeschlagenen Summe scheint
mir richtig zu sein. Allerdings
kann sicher bei der jetzigen Lage

kein Pfennig dazu aus Italien beschafft werden.

Unsere Patente sind jetzt nicht mehr in unseren Haenden, sodass wir nicht mehr darueber verfuegen koennen.

Ich glaube auch nicht, dass wir damit sehr viel Geld verdienen werden. Sollte das sein, so waere das eine sehr willkommene Unterstuetzung fuer mehrere der ~~Exkursionisten~~ Patentanmeldenden (die gleichen der zweiten Arbeit der Proceedings + Trabacchi), die sehr arm sind. Das wuerde uebrigens auch indirekt die Wissenschaft foerdern !

Die wissenschaftliche Lage hier in Palermo ist noch immer sehr schlecht. Praktisch werde ich hier zu wissenschaftlichen Arbeiten in diesem Jahr nicht mehr kommen.

Zu Ostern hoffe ich in Rom zu arbeiten, und fuer den Sommer denke ich an Columbia. Ich bitte Sie mir zu schreiben, falls Sie etwas hoeren sollten, was fuer mich von Interesse sein koennte.

Mit besten Gruessen

Ihr
Luigi Segre.

enjoyment

E. SEGRÈ
36 CREST ROAD
LAFAYETTE, CALIFORNIA

January 1, 1962

Dear Szilard:

I see that you are soon coming to Berkeley.

I hope to see you then. We would be happy to have you and your wife for dinner at our house on the 8th or the 9th. or any other day for that matter.

I do not know your detailed plans for the visit here and I would appreciate it if you would let me know.

Happy New Year and best regards

Cordially yours

Enrico Segre.