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U.S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS
WASHINGTON 25 DC

Aug 1, 1955

4.5

Sir K.S. Krishnan
Director, National Physical Laboratories
New Delhi, India

Dear Professor Krishnan:

You may remember that, at one time, I mentioned to you our plans for organizing an International Conference on Electron Physics. These plans have now matured to a point where we have reasonable expectation for having our Conference on the grounds of the University of Maryland in College Park, Maryland, April 23 - 25, 1956, the year of the 100th anniversary of the birth of J. J. Thomson. The title of the Conference will be "Quantum Interactions of the Free Electron" and will cover essentially: electron scattering, electron energy losses in solids, electron interference phenomena, electron polarization, and related fields.

The purpose of my letter today is to issue a cordial invitation on the part of the Steering Committee to attend this Conference. We are making every effort for this to be a good working Conference with a small but select number of participants. Unfortunately we cannot, at this time, offer you transportation or subsistence during your participation at the Conference, although every effort is being made to find financial means for this purpose. I sincerely hope that you can accept this invitation and that we will have the pleasure of having you with us next April. In the event that you find yourself able to attend, I should suggest/you apply for a United States visa at your earliest convenience.

With kindest regards

sincerely yours

sd/- L. Marton
for the Steering Committee

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22 APR 1957
U. S. DEPARTMENT OF COMMERCE

NATIONAL BUREAU OF STANDARDS

April 15, 1957

ADDRESS REPLY TO
NATIONAL BUREAU OF STANDARDS
WASHINGTON 25, D. C.

IN YOUR REPLY
REFER TO FILE NO.
4.5

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Sir K. S. Krishnan
Director, National Physical Laboratory
New Delhi, India

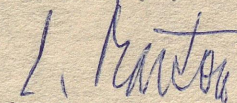
Dear Dr. Krishnan:

After a tour of Australia, we finally arrived home a few days ago and now we are taking stock of the many beautiful things we have seen. Needless to say that one of the highlights of the whole trip was our seeing Delhi. We enjoyed immensely visiting with you and your staff. Both you and your collaborators contributed enormously in making our stay in Delhi extremely fruitful and pleasant, and I don't know how to express our gratitude for it. We both hope that when you are coming next to this country in September, you will have time enough to stop over in Washington and that we will have a chance to entertain you at our home.

Incidentally, speaking of your coming to America, I would like to tell you quite briefly about some conversations I had, since I last saw you, on the subject of the proposed Commission on Electron Physics. I had a long chat with Prof. Brode in Berkeley and with Dr. Branscomb, at the National Bureau of Standards, who is a member of the Council of the Division of Electron Physics of the American Physical Society. The whole outlook is considerably brighter now. I think that we succeeded finally in overcoming some of the resistance encountered at the Division of Electron Physics and a letter of recommendations on the part of that organization is supposed to be forthcoming. On the basis of this, I hope that there will be good success in the General Assembly in Rome, and that the Commission on Electron Physics will be a reality by the end of September.

With kindest regards and best wishes from both of us.

Sincerely yours,



L. Marton
Chief, Electron Physics Section

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15 JUN 1957
U. S. DEPARTMENT OF COMMERCE

NATIONAL BUREAU OF STANDARDS

June 7, 1957

ADDRESS REPLY TO
NATIONAL BUREAU OF STANDARDS
WASHINGTON 25, D. C.

IN YOUR REPLY
REFER TO FILE NO.
4.5

Sir K. S. Krishnan
Director, National Physical Laboratories
New Delhi, India

Dear Prof. Krishnan:

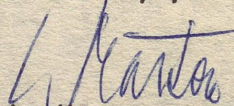
The attached copy of letter to Mott is self-explanatory. I am sending it to you as a member of the now defunct ad hoc committee. I hope that when you come to America, and will go to Europe you will see some electron physicists and take the opportunity to put in a good word in favor of the commission.

In the meantime I have received the collection of reprints which you were so kind to send me. Now that I have had more time to go through them, I am extremely impressed by the amount of work performed by your laboratories and by its quality.

I have not forgotten our conversation about wild rice and I started some inquiries about the availability of literature on the subject. Unfortunately, I have to report no success at all. It appears that nobody in the United States is working on wild rice and the Agriculture Department at Beltsville is not aware of any work in the past either. Let me know if I can be of any further help on this subject.

With kindest regards from both of us.

Sincerely yours,



L. Marton
Chief, Electron Physics Section

Enclosure

U. S. DEPARTMENT OF COMMERCE

NATIONAL BUREAU OF STANDARDS

June 6, 1957

ADDRESS REPLY TO
NATIONAL BUREAU OF STANDARDS
WASHINGTON 25, D. C.

IN YOUR REPLY
REFER TO FILE NO.

4.5

Prof. N. F. Mott, F.R.S.
President, International Union of Pure
and Applied Physics
Cavendish Laboratory
University of Cambridge
England

Dear Mott:

Although I have been home for a few weeks it is only now that I find the opportunity to write to you again. I enjoyed very much talking to you while I was in London and according to our agreement I pursued some conversations on the subject of my proposal to create a commission on electron physics.

As you know I have been expending a great deal of effort in an attempt to get a commission on electron physics established. Numerous important scientists have indicated to me a strong interest and I have been notified that three National Committees, United Kingdom, Germany, and Belgium are prepared to support a proposal. Curiously, the reception on the home front is, to me, discouraging and it seems that the best way to achieve a commission would be for one of these National Committees to propose it.

In view of this situation I feel that I have pushed things as far as it is appropriate for me to do and that the proper course of action is to let those who have expressed strong interest now take the initiative. Consequently, I do not plan to attend the Rome Assembly to press the matter further. This, of course, does not mean that my enthusiasm is any less, but rather that it is now time to let the expressed interest make itself evident. I still want very much to see a commission established and I hope that someone will generate the necessary action.

With best thanks for your interest in this matter and with kindest regards,

Sincerely yours,

Bill M.

L. Marton
Chief, Electron Physics Section

First Draft

81-NO(1)A

PROPOSAL FOR THE CREATION OF A COMMISSION ON ELECTRON
PHYSICS WITHIN THE FRAMEWORK OF THE INTERNATIONAL
UNION OF PURE AND APPLIED PHYSICS

It is proposed herewith that a Commission of the IUPAP be established called, "Commission on Electron Physics." This Commission will be a specialized Commission operating within the framework of the IUPAP and would have the task of coordinating efforts toward international cooperation in its chosen field. Electron Physics, as defined for the purpose of the program of this Commission, is the physics of the free electron. It includes the study of the nature and properties of free electrons, as well as the study of the interactions of electrons with fields of forces. This definition does not place any limitation on either the energy of the electron nor on the nature and dimensions of the fields of forces with which it is interacting. This means that electrons from the lowest possible velocities up to the highest observed ones are included in this field of activity and that fields of forces from the galactic dimensions down to the sub-atomic ones constitute its domain of inquiry. Equally, both time-invariant and time-variable fields of forces belong in the categories here listed. This definition, however, excludes from consideration the bound electron as well as the conduction electron, which belong properly within the realm of solid state physics. There exist boundary phenomena, which constitute legitimate subject of inquiry for both solid state and of the electron physics commission such as, for instance, electron emission phenomena or what is commonly called physical electronics. Whenever a need may arise, such phenomena can be assigned, depending upon the circumstances, to either of the commissions.

Keeping in mind the above definition, the following tentative classification of branches of electron physics can be suggested:

- I. Nature of the electron --
 - (a) Charge
 - (b) Mass
 - (c) Wavelength
 - (d) Length of the wavepacket
 - (e) Spin
 - (f) Magnetic moment

- II. Interaction with macroscopic fields of forces --
 - (a) Electrostatic fields
 - 1. Low energies
 - 2. High energies

- (b) Magnetic fields
 1. Low energies
 2. High energies
- (c) Combination of (a) and (b)
 1. Low energies
 2. High energies
- (d) Any other type of fields
 1. Low energies
 2. High energies

III. Interaction with microscopic or sub-microscopic fields of forces --

- (a) Electrostatic fields
 1. Low energies
 2. High energies
- (b) Magnetic fields
 1. Low energies
 2. High energies
- (c) Combination of (a) and (b)
 1. Low energies
 2. High energies
- (d) Nuclear fields
 1. Low energies
 2. High energies
- (e) Any other type of fields
 1. Low energies
 2. High energies

IV. Application of the foregoing to other fields of physics --

Suggested frame of activity of the CEP. The focus of activity is to be on the international scale, the CEP to foster practical international cooperation on all matters pertaining to electron physics. Such subjects of international cooperation include: To sponsor and to organize symposia, to facilitate in any other manner the exchange of ideas, to counteract restrictive legislation in different countries, to promote international services such as tables, laboratories, advice to administrators of fellowships, the establishment of symbols and nomenclature, and to promote agreement on internationally accepted values of fundamental constants.

To give an example of occasions at which an international gathering in commemoration of a great event in electron physics could take place, it is suggested that some kind of symposium or other international meeting be set up to commemorate the centennial of the birth of H. Hertz (1957).

JAN 1 1955

Report on the General Assembly of the
International Union of Pure and Applied PhysicsJuly 6 - 10, 1954

SI-NO(110)

I attended the General Assembly of the IUPAP as a delegate of the National Academy - Research Council. The main activities of the assembly have already been reported on by the Chairman of the delegation, Professor Slater. My report will be restricted to the activities with which I was most directly concerned, that is: the possible creation of a Commission on Electron Physics and the possible sponsoring of an international conference on Electron Physics by IUPAP.

About a year ago I circulated a proposal for the establishment of such a commission, including the first draft of a definition of electron physics and a description of a suggested sphere of action of a commission devoted to this subject. This proposal, a copy of which is attached, was sent to some 40 representatives of electronphysics as well as to several officials of the IUPAP. At the time of the assembly 35 answers were on hand. Out of these 35, three persons were very definitely against the creation of a new commission, five could not decide, and the remainder were in favor of such a commission. Those in favor can be divided into two categories: Some accepted the principle without comment, and quite a number criticized the definition as set forth in the preliminary proposal. One criticism said, in essence, that the proposition goes too far on the direction of high-energy electron physics. It has been pointed out, and quite rightly, that the region of very high energies is a proper domain of nuclear physics. On the other hand, criticism was voiced that the proposal contains too little physical electronics. Several comments were quite emphatic about the necessity of including emission phenomena in electron physics instead of leaving these aspects to solid-state physics.

The proposal and an analysis of the comments received were presented at a session of the Executive Committee of IUPAP, and following that, the matter was presented for discussion in the General Assembly. At that time the following objections were raised against the creation of an Electron Physics Commission: (1) that a Joint Commission of Electron Microscopy exists (this being a joint commission between IUPAP, the International Union of Crystallography, the International Union of Biological Sciences, and the International Union of Pure and Applied Chemistry), (2) that the URSI has a Committee entitled Electronics, (3) that the field is too loosely defined, and (4) that the proposition is based on the physics of an elementary particle and, if such a principle is admitted, other commissions might logically be created on the basis of the physics of protons, mesons, etc.

In my answer to these objections I emphasized, (1) that the Joint Commission on Electron Microscopy is not a physics commission but a gathering of biologists, chemists, metallurgists, and some physicists, having an instrument as a base of common interest but otherwise directed toward fields quite remote from physics; (2) that the activities of the Electronic Commission of URSI have also a different orientation from the proposal contained in my first draft; and (3) that electron physics is a relatively new and growing field which is based on a particle which is indeed elementary but which is the only one having very wide-spread scientific and industrial applications.

After some further debate, the president, Professor N. F. Mott, announced that no immediate action would be taken on the creation of the commission, but that its usefulness should be investigated; and if it turns out to be really worth while, the next general assembly in 1957 could take the necessary steps. In order to decide at that time whether or not the commission is needed, Sir K. S. Krishnan has been appointed by the president to investigate a possible overlapping of the functions of the URSI electronic commission and of the proposed electron physics commission. Professor Krishnan was also asked by the president to look into the desirability of the creation of a Joint Commission on Electron Physics between UIPAP and URSI. It was also recommended that the experience of an international conference on electron physics (planned by Professor J. W. Beams and myself for April 1956 at the University of Virginia) be considered in determining the necessity of such a commission. In addition, the president advised that an informal group investigate the need for such a commission and prepare, if necessary, a new definition of electron physics and of the scope of the proposed commission. Such an informal group was constituted right away in London, during the time of the General Assembly, and consists of the following persons: Professor H. S. W. Massey (United Kingdom), Professor G. Dupuoy (France), Professor E. Persico (Italy), Sir K. S. Krishnan (India), Dr. K. K. Darrow and Dr. L. Marton (United States).

Private conversations after the debate indicated that my arguments were well received. Several delegates conveyed a very favorable attitude and members of the German delegation told me of a decision of their group to support my proposal.

Since the time of the General Assembly I have corresponded with Professor Krishnan who attended the General Assembly of URSI in The Hague, in the last days of August. The following is an excerpt from Professor Krishnan's letter dated August 28, 1954: "Commission VII of URSI decided (1) to change its name from "Electronics" to "Radio Electronics" so as to describe precisely the limited scope of its work on electronics that would normally

come under its purview, though it is emphasized in the resolution that this should not in any way restrict their freedom to include also other branches of electronics, (2) to recommend the formation of a Joint Commission on Electron Physics in which both URSI and IUPAP will be represented. The Executive Committee of the URSI and its Board will definitely accept (1) as far as I could guess, and it will most probably accept (2), also."

In his second letter dated September 3, Professor Krishnan wrote: "The consideration of the formation of the new Commission on "Free Electron Physics" did not come up before the Executive Committee, and hence it was not considered by the General Assembly. The Bureau has decided to postpone. They feel that it is premature to consider the formation of a joint commission on free Electron Physics when our Commission VII on Radio Electronics is just starting its new activities under the chairmanship of Dr. Woonton."

A few days after the General Assembly of IUPAP, I attended in London an International Conference on Electron Microscopy, which was organized by the Joint Commission on Electron Microscopy. During the time of the International Conference, there was also a meeting of the Joint Commission. I did not attend meetings of the Joint Commission, but I learned through persons participating in it that it was proposed to change the title of that Commission to "Joint Commission on Microstructure." It was also proposed that the modified commission should have a subcommittee under the chairmanship of Professor B. v. Borries, grouping those who have an interest in the development of the electron microscope. Such a move, in principle, would have been quite favorable to our plans because of one of the objections raised in the General Assembly. The modified title clearly distinguishes the aims of the Joint Commission from the Commission on Electron Physics.

Quite recently I learned that the proposal of modifying the title and the aims of the Joint Commission on Electron Microscopy was rejected by ICSU, and thus, the Joint Commission on Electron Microscopy is dissolved, or is going to be dissolved. I understand, also, that certain efforts are being made to create an international federation of groups interested in microstructure, independent of ICSU, and replacing the defunct Joint Commission. Needless to say, any such move cannot interfere with the aims described in my proposal. If there is any effect on the proposal, it would be a strengthening one.


L. MARTON

APPENDIX C

College Park, Md.
April 25, 1956

The undersigned, assembled at the University of Maryland in College Park, Maryland, have participated in an international conference entitled "Quantum Interactions of the Free Electron".

This conference was found to be extremely fruitful because of the opportunity to engage in personal discussions with specialists in the same and adjacent fields, to exchange views, and to learn directly about activities in the several institutions studying the basic physics of the electron. The state of our knowledge has profited considerably from the combined discussions of many authorities made possible at this meeting. There have been several previous conferences dealing with special topics in electron physics which attracted wide attention. For example, one was held in 1951 in the United States under sponsorship of the National Bureau of Standards, a second in Tübingen, Germany in 1954, and a third organized by the Centre Nationale de la Recherche Scientifique, in Toulouse, France, 1955. We felt that the present conference, the first to be sponsored by the International Union of Pure and Applied Physics on this topic, has proved so successful as to warrant repetition and to make the organization of similar conferences on a regular basis desirable.

We wish, therefore, to express our desire to see such meetings organized, and to have a body created for the organization of such meetings as one of its main tasks. The International Union of Pure and Applied Physics has the power to create within its framework a commission charged with this task and with other tasks necessary for the advancement of international relations and communications between workers engaged in electron physics. "Electron Physics" for the purpose of the program of such a commission, is defined as the physics of the free electron, including the study of the nature and properties of free electrons as well as the study of the interactions of electrons with fields of forces.

A motion to create a Commission on Electron Physics was introduced in 1954 at the General Assembly of The Union. At that time the motion was tabled with a view to make the necessity of creating a Commission partially dependent on the success of the present conference. It is felt that by now there is sufficient evidence of widespread interest in this subject.

We therefore, have asked the Chairman of the Steering Committee of this present conference, assembled at the University of Maryland, to transmit this petition to the President of the International Union of Pure and Applied Physics.

| | | | | |
|------------------|---------------------|----------------|-------------------|-----------------|
| G. Dupouy | Wm. P. Allis | S. Berko | J. A. Suddeth | J. W. M. DuMond |
| H. S. W. Massey | A. Septier | J. S. Plaskett | S. R. Mielczarek | P. A. Sturrock |
| G. P. Thomson | J. M. Blum | M. Dresden | S. G. Ellis | E. Bleuler |
| Rudolf Hutter | A. R. Lang | M. Chanson | E. N. Lassette | F. Seitz |
| F. B. Riggs, Jr. | Karl K. Darrow | A. Ore | J. A. Simpson | H. J. Quinn |
| R. Castaing | C. Fert | H. Salecker | D. C. Schubert | M. D. Wagner |
| P. Grivet | P. Budini | W. Brandt | P. Kisliuk | H. Mendlowitz |
| R. Bernard | John S. Toll | V. L. Telegdi | F. E. Myers | L. B. Leder |
| E. J. Sternglass | F. G. Brickwedde | E. S. Dayhoff | H. E. Hinteregger | |
| J. E. Holliday | W. Grattidge | P. Stehle | G. Weissenberg | |
| David Pines | U. Fano | R. D. Myers | Paul Mazur | |
| Richard Ferrell | D. Gabor | John C. Slater | A. Klein | |
| | G. Mollenstedt | L. Marton | Vernon Hughes | |
| | F. L. Hereford, Jr. | | Lorne Page | |
| | | | M. Heinberg | |
| | | | S. B. Gunst | |