

Guido Beck in Rio de Janeiro

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The letters that I exchanged with Guido Beck in the years 1946-1980 describe some of our scientific activities in that period.

In 1946, I returned from Princeton where I had worked with Wolfgang Pauli and Josef Maria Jauch, during the years 1944 and 1945. In Rio, I learnt from the Portuguese mathematician Antonio Aniceto Monteiro who was teaching at the Faculdade Nacional de Filosofia, from the German physicist Bernhard Gross who was at the National Institute of Technology and from Costa Ribeiro, Physics Professor at the National Faculty of Philosophy, that Guido Beck was in Argentina, at the Observatório Astronômico de Córdoba, with a position that had been offered him by the Argentine Physicist Enrique Gaviola. Now, while I was in Princeton I had studied three articles of Beck, namely: *Allgemeine Relativitäts Theorie*, published in the *Handbuch der Physik*, Bd. IV, Springer, Berlin, 1929, and then *Kernbau und Quanten mechanik*, in the *Handbuch der Radiologie*, Bd. VI/1, Akad. Verlags Gesellschaft, Leipzig, 1933. And a third article in a book entitled: *Die Differential und Integral-gleichungen der Physik*, edited by Richard von Mises and Philipp Frank.

These chapters, written in an elegant fashion, became basic texts in their respective fields, at that time.

I, therefore, once in Rio, wrote to Beck and the first letter of which I have a record is dated 25th August 1946. In it I give an account of my first months of activity at the Faculdade Nacional de Filosofia (National School of Philosophy, Sciences and Letters), where I occupied the chair of

Theoretical and Advanced Physics (Física Teórica e Física Superior). This chair had been vacant during three years, after Italian professors had left Rio in 1941 as a result of the state of war between Brazil and Italy. Costa Ribeiro, who was Professor of Experimental Physics, and San Tiago Dantas, the Director of the Faculdade Nacional de Filosofia, appointed me to the chair as I was about to come back from Princeton. Previously, during a visit of Gleb Wataghin and Marcello Damy de Souza Santos to Princeton University near the end of 1945 in connection with an accelerator they were planning to build for São Paulo University, I had the occasion to discuss with them about what I should do as I was concluding my thesis with Pauli. Two possibilities were open:

- 1) to accept the indication of my name to the chair in Rio;
- 2) to continue my research work in the United States for a few years more.

As I completed my Ph.D. work, Jauch had invited me to be Instructor at Princeton University or have a fellowship to continue working with Pauli at the Institute for Advanced Study in Princeton where Pauli was a Visiting Professor and had been invited to be a Permanent Member, to occupy the chair of Albert Einstein who was retiring from the Institute in 1946.

Wataghin told me that such a position like the chair at the Federal University in Rio was not easy to be found anywhere: I might accept it and then work hard in research and educate young people for physics research, get international collaboration

and go abroad frequently to exchange ideas with colleagues and accompany research done abroad.

I decided then to accept the position in Rio and came to the Faculdade Nacional de Filosofia in 1946. I looked for collaboration with my colleagues of the University of São Paulo, with Mario Schönberg, with whom I had worked in 1943, Gleb Wataghin, Abrahão de Moraes, Walter Schützer, Jayme Tiomno, and was interested in the work of the experimental physicists led by Marcello Damy de Souza Santos and Paulus Aulus Pompéia who had made a fundamental experiment in 1941, with Wataghin, which led to the discovery in São Paulo of the penetrating showers of cosmic radiation. Jayme Tiomno, who had been called for military service, had therefore not been able to leave and work abroad on a fellowship; he was, however, preparing himself to travel later on and was enthusiastically working in collaboration with Schönberg and Schützer in São Paulo and came frequently to the Seminars I organized in Rio.

With Cesar Lattes, who was at Bristol University in England in 1946 and who had been my colleague in São Paulo in 1943, I started a correspondence on our work and suggested that he come to Rio on his return to Brazil.

After my arrival, Jayme Tiomno, together with Elisa Frota Pessoa, an experimental physicist and a co-worker with Costa Ribeiro, came to the seminars I organized for the preparation in the shortest time possible of young physicists. Tiomno and I started working on meson theory of nuclear forces and concluded a paper on proton-proton collisions.

I found in Guido Beck an excellent resonance. Through Costa Ribeiro he sent me an invitation to go to Córdoba, Argentina, to give seminars for the group of young physicists he was working with. However, colleagues of mine, mainly Monteiro, thought it would not be good if I went away and left the work I was developing at the Faculdade Nacional de Filosofia, not even for a month. It is essential that the students we are forming feel that we take our job seriously, that the regularity of the courses and seminars and the continuity in our efforts must not be interrupted. Besides students of the Faculdade, there came to our courses and semi-

nars, students from the National School of Chemistry, from the Mathematics Department of the Faculdade Nacional de Filosofia and even young Navy Officers like Gabriel Fialho and J. Aratanha. So, instead of going to Córdoba I explained the situation in Rio to Beck and invited him to come to Rio with the promise of having students already in condition to work with him.

In his letter of 7 September 1946, Beck writes: "I have been very interested to learn from your letter about the situation in Rio de Janeiro. I trust that we will be able to establish a much closer contact with Brazilian universities and if we work together this will help a great deal, also for obtaining the necessary funds. Here we have been able to find much more support since we have succeeded to coordinate research work a little bit more and we feel already the consequences of it".

On September 24th 1946, Beck wrote me accepting the invitation to come to Rio and proposed to give a two hours-a-week course on Dirac's theory of the electron and a seminar "together with you, Dr. Costa Ribeiro and Dr. Gross + any amount of interested advanced students you may be able to mobilise".

As Beck arrived in Rio I had a student prepared to work with him, Paulo Sergio Macedo. On July 8, 1947 Beck sent a report to the Head of the Department of Physics, Costa Ribeiro, on his lectures, his seminars, and the impression he had of our activities.

I had of course written Beck about my work with Pauli and sent him my publications.

I spent sometime in São Paulo and wrote to Beck on my work on Schönberg's proposals to eliminate divergences in quantum field theory. It was also the time for studying articles inspired by Heisenberg's papers on the *S*-matrix.

In June 1947, missions of astronomers arrived in Brazil for observations on a solar eclipse. I had the occasion of meeting the Russian physicist Vitalie Ginsburg from Leningrad who was in the Soviet group with whom I talked for several hours. He told me about the work of the Landau group and asked me about Einstein, Pauli and other physicists in Princeton. He knew me through a ci-

tation by the Russian physicist I. Tamm of a paper of mine.

In a letter to Beck dated June 11, 1947 I described our Seminar activities with Tiomno, Hervasio de Carvalho, Elisa Frota-Pessoa, Paulo Sergio, Gabriel Fialho and others and sent him some results of calculations on n-p scattering.

1947 was the year of the discovery of the pions and of the pi-mu decay by Cesar Lattes, Giuseppe Occhialini and Cecil Powell.

That year, Lattes came from Bristol to the Laboratory of the Universidad Mayor de San Andrés in La Paz, Bolivia through Rio de Janeiro and exposed nuclear emulsions at the Chacaltaya mountain, at the height of 5000 meters. After that exposure, Lattes came to Rio de Janeiro and developed at the Physics Laboratory of the Faculdade Nacional de Filosofia a plate which showed the first pi-mu decay by using a microscope of Costa Ribeiro's Laboratory.

The first pi-mu decay was thus seen in Rio in 1947 and we were excited with this new reaction.

In my letter of October 1, 1947, I discussed with Beck the results which were sent me by Lattes. Theoretically, the picture of nuclear forces was dominated by a theory proposed by Chr. Moller and Leon Rosenfeld and modified by Julian Schwinger, which assumed the existence of two kinds of mesons, vector mesons and pseudoscalar mesons, with different masses (Schwinger). I tried to apply these ideas to the two mesons discovered in Bristol. Calculations were carried out on the reactions (J. Leite Lopes, *Nature* (London), **160**, 866 (1947)):

$$p + \mu^- \rightarrow n + \mu^0$$

$$p + \mu^- \rightarrow p + \mu^-_{ps}$$

as well as a discussion of the decay.

$$\pi \rightarrow \mu + \mu^0$$

μ^0 is a neutral vector meson, μ^-_{ps} a negative pseudoscalar meson. The decay of the pion π into a muon μ would be accompanied by a neutral particle μ^0 called at the time a neutretto (nowadays identified as a muonic neutrino).

Papers by Bob Finkelstein and by Hans Bethe and Robert Marshak were discussed with Beck by correspondence. Then in 1948 I sent a cable to Beck to announce the productions of the pion-meson by Lattes and Eugene Gardner in the 18-inch synchrocyclotron capable of accelerating protons at the energy of 330 MeV.

Beck immediately replied saying: "Congratulations to all of you. I feel as happy as you do. ...Here I used Lattes mesons immediately in order to make lots of noise."

In 1948 Tiomno had gone to Princeton and I maintained correspondence with him on π - and μ -mesons. John Wheeler and Tiomno had published in the *Reviews of Modern Physics* in 1949 two important papers in which they made an extensive study of the muon capture, with several different types of possible Fermi Couplings of the four spin 1/2 particles involved - spin 1/2 had just been assigned to the muon by Bruno Pontecorvo and by Tiomno and Wheeler. These papers had a great repercussion as they were among the first to point out the existence of a principle of the universal Fermi interaction.

As the work of Lattes and Gardner was well publicized by the Berkeley Radiation Laboratory we developed new efforts to bring Lattes to Rio de Janeiro. This was an old idea, since the time, in 1943, when we were colleagues in São Paulo. I wrote articles for newspapers on the significance of his work. Costa Ribeiro and I had previously proposed to the Rector of the University the creation of a chair of Nuclear Physics for Lattes at the Faculdade Nacional de Filosofia in Rio. In 1949, the idea arose of the creation of a new Center for Research in Physics, independent of the Government, since the Federal University was ruled by authorities who did not understand the importance of stimulating research in physics - this at a time when nuclear physics was living its glorious days in the industrialized countries - and after Lattes got his chair, it was difficult to obtain grants for equipment.

This movement was able to get the support of João Alberto Lins de Barros, a well known political leader and man of enterprise, brother of Nelson Lins de Barros, an intellectual who worked at the

Brazilian Consulate in Los Angeles and who became a good friend of Lattes and myself. Funds were obtained, starting in 1949, from some industrialists and bankers like Mario de Almeida, Guilherme Guinle and Euvaldo Lodi and we had by 1951 a nice small building for the new institute, called the Centro Brasileiro de Pesquisas Físicas, CBPF, at the Campus of the University at *Praia Vermelha*. The Rector gave us the status of University mandate and the CBPF took charge of the graduate courses in Physics of the University in Rio.

With the new building, the CBPF took the air of nice little institute of research. UNESCO sent us a mission constituted of Professor Gert Molière, from Germany, Dr. Hans Joos, his Assistant, Professor Guiseppe Occhialini one of the discoverers of the positron and of the pion, Dr. Ugo Camerini, a colleague of Lattes at Bristol and the technicians Dr. Gehrard Hepp, from Philips, Holland, and Dr. Helmut Schwartz, a specialist in high-vacuum. The library began to be built and UNESCO gave us bonuses for buying books and journals.

In 1951, we invited Beck to come to the CBPF. We also invited Richard Feynman who accepted to spend his sabbatical year 1951-1952 at the CBPF¹. In the same year two Argentine students came to our laboratory on a fellowship, Daniel Amati and Albert Sirlin and students came from Bolivia, like Oscar Troncoso, from Costa Rica like N. Clark and from other cities of Brazil. There was a healthy intellectual atmosphere and much enthusiasm - Feynman came to the CBPF in the North Summers for several years. The CBPF established relations with the International Union of Pure and Applied Physics, with research institutions in Brazil and in Latin America and particularly with the Universidad Mayor de San Andrés in La Paz in cooperation with Bolivian physicists: scientific research on cosmic rays in Chacaltaya continued.

In 1951, an important event in Brazil was the creation of the Brazilian National Research Coun-

cil - Conselho Nacional de Pesquisas, CNPq - which gave full support to the CBPF. Our institute was the host to a number of physicists from Europe and the United States as well as from Argentina, Bolivia and México who came to the *Symposium on New Research Techniques in Physics* which was organized by the Brazilian Academy of Sciences and the UNESCO Center of Scientific Research in Montevideo with the support of the CNPq.

As Beck came to the CBPF and decided to accept the post of professor he began an intense activity: he gave lectures and attracted students for initiating research work - his first student was Paulo Sergio de Magalhães Macedo who was my student at the Faculdade Nacional de Filosofia and he started working with Beck when he came to the Faculdade in 1947, in his first visit to Brazil.

Beck went several times to São Paulo, to the Physics Department of the University, where he stayed mainly with Gleb Wataghin, Mario Schönberg and H. Stammreich. He also directed seminars and established the routine of a weekly colloquium preceded by tea. He had several students who initiated work for a thesis, from Rio, S. Paulo, Bahia, Argentina.

During all the years in which Beck was at the CBPF he travelled several times to São Paulo, to Argentina and to Europa, always exchanging letters with me.

In 1957 he announced to me while I was at the California Institute of Technology that the most valuable thing that he found in São Paulo "is called H.M. Nussenzveig". "He is the most promising young man that I found since I began my career. Of course I took him along with me to the CBPF. I want him to solve yet the antenna problem after that he should go to Europe."

In 1959, Guido Beck succeeded Oliveira Castro as Scientific Director of the CBPF who in turn had succeeded Lattes. That was the year when a fire destroyed the Laboratory of Nuclear Emulsions and the Library of the Center, and we developed efforts to build a new library - Richard Feynman made a donation of books and journals and wrote to colleagues asking for help to our library - and the Ford Foundation contributed with

¹ See Jagdish Mehra, *The beat of a different drum. The life and science of Richard Feynman*, Chapter 16, Clarendon Press, Oxford 1994.

100.000 dollars to it. In the same year, in July I participated in the First Latin American School of Physics which was held in Mexico's Universidad Nacional by initiative of Marcos Moshinsky.

After I came back I accepted an invitation from J.J. Giambiagi to give some lectures in Buenos Aires where he was the chairman of the Theoretical Physics Group at the National University of Buenos Aires. After these two trips and after having seen the Latin American Center of Mathematics which UNESCO had established in Buenos Aires, I proposed to Guido Beck to submit to the Scientific Council of the CBPF that this institute ask UNESCO through our Ministry of Foreign Affairs the establishment of a Latin American Center of Physics in Rio de Janeiro. We developed efforts for its approval at the General Assembly of UNESCO. This was obtained mainly thanks to the work made by Paulo de Berredo Carneiro, who was the Ambassador of Brazil at UNESCO. This Latin-America Center of Physics (CLAF) is important for strengthening the cooperation among physicists in this continent by giving fellowships and promoting meetings and conferences.

In 1962-1963 I had the task of organising the Institute of Physics of the University of Brasilia; the fact that the new capital was built up from scratch meant that one had a chance to have there a university without the faults of traditional Brazilian universities. As one physicist alone could not accomplish such a task well I invited a group of physicists to work with me on this project and Guido Beck was appointed to this group together with Roberto Salmeron (who was in Europe at CERN), Jayme Tiomno, Gabriel Fialho and Ricardo Palmeira. Out of our discussions came a pro-

ject² which was materialised in 1964 thanks to the initiatives taken by the anthropologist and educator Darcy Ribeiro.

In 1964, after a succession of political and financial crises, there came a coup d'état in Brazil. Police and military inquiries were installed in almost all universities and research institutes and many scientists and university professors were dismissed or put in compulsory retirement. I was one of them. As I could not be appointed to any job in any institution which received money from the government I accepted invitations to work abroad. In 1964 I went to be a Visiting Professor at the Faculté des Sciences d'Orsay invited by Maurice Lévy and in 1969 I went first to Carnegie-Mellon University at the invitation of Sergio de Benedetti and Lincoln Wolfenstein; and in 1970 I accepted an invitation by M. Paty and G. Monsonogo to be a Visiting Professor at the Université Louis Pasteur in Strasbourg, France, of which I became in 1974 a Full Professor.

During all this time I had news from Beck either from CERN, Geneva, or from Vienna, Austria, from Paris, from Bariloche in Argentina, from CBPF or from the Federal University of Rio de Janeiro. He also came to Strasbourg at least twice to see me. And to Darmstadt, where he received the title of Doctor Honoris Causa. And finally the Federal University of Rio de Janeiro gave him a similar title.

It was a privilege for me to have worked at the side of Guido Beck, who always had transmitted enthusiasm for research work, who enjoyed to have young students working with him, a loyal friend, a man of culture, sensitivity and a fine sense of humor.

² J. Leite Lopes, *Ciência e Libertação, Paz e Terra*, 2ª Ed. Cap. 14, Rio de Janeiro, 1978.

Córdoba, August 1st 1947

My dear Leite Lopes,

It is only now, that I can thank you for all your kindness and for the beautiful stay in Rio. I trust that you will let me know soon, how things are developping and how the boys are working. Tell my regards to all of them and to Elisa too. I am, in particular, anxious to know how the matter stands with Paulo Sergio's fellowship to Córdoba. Is there anything I can do or push?

I sent you a few separate copies, but only two copies of the "espacio fisico" (there are no more left). On my way back, it occured to me, that Paulo Sergio's paper may give useful indications about the way of writing hypercomplex solutions in an external field in the case of Dirac's theory. Could he already try to do this by himself?

As far as I am concerned, I have series of letters and reports to write, but I trust that I will be back to work within a few weeks. Tell my regards to Montseir. I am going to write to him, as soon as my report to the Soc. Prot. f. Sc. and Learning will be ready.

The best I can report from here is the dry and cool climate (in this moment), the quality of the food and the cordial reception by the manifold $L = L' + L''$ where L' means the ladies from B.A. and L'' those from Córdoba. The rest is pretty dark, much darker then I expected!

In La Plata R. Gans has arrived and has, at least unconsciously, been received as the salvation. In reality, his possibilities, however, are very limited. For the moment, he can hardly do more than make the boys do the "advanced practice" instead of research work and he has no access to basic teaching. Still, already this means some progress. - In B.A. F. Ishardi has accumulated momentum, as a reaction of Sao Paulo, but this will rather lead, according to my opinion, to disappointment, since he does not know how and, in addition, wants to run everything by himself. - Here in Córdoba I found "a mess". Instead of the new situations promised, Gaviola got trouble with the ministry and made, once more, one of his "resignations". This can lead, eventually, to very serious trouble and even to the loss of all what has been done here during the last 10 years.

In B.A. I have been able to settle Stone's (very easy) problem and, if one can believe what people say here, the (slightly more difficult) one of Albert. Nothing more. I made noise, that they did not profit of Lettas stay in South America (it costs them, probably, a series of promising work they could have done with mutual profit) and because of the dropped AFA-meeting in Rio. Still, the worst is, that nothing is done with respect to Heisenberg and Sitte, after they have taken serious responsibilities.

Letter from Guido Beck to Leite Lopes.

- 2 -

I am, now, quite alone to fight this matter through, since everybody is afraid of doing it. Gaviola, after having written his, fruitless, open letter, refuses to do anything. He and the other fellows here react very much to what I can tell about physics in Brasil, instead of taking it as an encouragement and as a proof that positive work can be done. This is, psychologically, about the worst what can happen and I regret to have to tell the many boys who felt lately attracted by physics (not less than 50), that, in spite of all their enthusiasm, they may have to face, once more, complete failure. Personally I feel very grateful towards you and towards the Sao Paulo people for the possibility of escaping, eventually, to Brasil, but I feel very much that this is no solution and that I cannot abandon the boys unless the situation is quite hopeless.

I should like to ask you to keep me informed about an eventual possibility to get K. Sitte to Rio, e.g. under similar conditions as Monteiro. This could, eventually, influence things favourably. Still, I feel very much, that you have, first of all to settle your own position and the one of Lattes.

How are Dona Carminha and José Sergio?

Best wishes e um grande abraço to all of you,

cordially yours

Wick Beck.

Faculdade Mac. de Filosofia
Rio, 11. Junho. 47.

(1)

My dear Beck:

I was very happy in having news from you and hope that you are well now. Last Friday I was with Ginsburg at the Pax Hotel and talked a lot with him. He promised to send me his and Tamm's reprints and wants to receive our papers and suggestions. Unfortunately he was a little tired and preferred not to make a Seminar. He left last Saturday.

Costa Ribeiro had given our Seminar's room and hour (5 to 7 on Thursdays) to be Grand for him to make a new course on "Optique de la mer". As soon as I knew it (after I left Ginsburg) I protested firmly: I told him, among other things, that we were responsible before the students and assistants for maintaining the Department on a decent level of work, that work has to be made into a tradition and not as a "season show" and that the Seminar shall continue at any cost at the same place and hour. He told me that he did not know (!) the which were the days of our Seminar and changed he Grand's hours.

I still do not think that Rio's problems will be solved favourably by the fact that Costa Ribeiro will have money from the Fundação Getúlio Vargas. This is, of course, quite a help but is not the fundamental one for the following reasons: 1) the essential first step is to create a full-time position for Hatties and get the full-time for us and assistants; 2) the money of the Vargas Foundation has to be employed in apparatus and not in people; 3) consequently, if Costa does not try to change the mind of the Fundação's people, we shall simply have more apparatus and gadgets to be put in Costa Ribeiro's museum. It is obvious that the right people, like Hatties, have priority for the solution of our problems. Therefore, Costa Ribeiro has to: 1) either convince the Fundação that the grant may be used for getting the right people also; 2) or to get the conditions for having the right people, from the University.

I went to Moses and he told me that he had talked with the Rector about our problems. The Rector said that in his opinion full-time would hardly be put into practice because the majority of the University's professors were not

worth it. Moses asked me to find out how São Paulo gives the full-time (what is the criterion followed by the Rector there, if there is any commission for ~~ad~~ judging and granting or not the full-time, etc) so that he can work out a plan and suggest it to our Rector. I would appreciate it very much if you could find that out from Mario, Marcelo or Wataghin. Moses, as you remarked to me, is a good man and is proving to be so again.

The situation of Paulo Sergio's fellowship is this: the Rector told Paulo Sergio's father that there exists one difficulty, namely: the University has money for inviting students from other Universities to study here and not to send students abroad (1). But he did not say no and we hope to get the thing.

At present our activities are the following:

- 1) I continue with my little Seminar on meson theory;
- 2) Tiomus goes on with his little Seminar (from now on quoted as Li-Seminar or Baby-Seminar) on Heitler's book;
- 3) Kervasio has started an Li-Seminar on Matthauch-Flügge's book;
- 4) Paulo Sergio makes an Li-Seminar on some chapters of Mott and Massey, Theory of collisions;
- 5) Elisa will start a Baby-Seminar on Weisenberg's book on cosmic rays.

To-morrow we shall have Kervasio talking in the Main Seminar on the capture of mesons (paper of the Italians + one of Yamakawa and Siegmundsson + Weisskopf-Teller-Fermi-Wheeler). Last Thursday was a holiday and the Faculdade was closed.

Next Thursday Elisa will talk in the Main Seminar on π -p scattering (papers by Bartsch, R. Simoes (old one) and Kamenetz (old one) and B. H. French (new one)).

I am still calculating π -p and π -p scattering cross sections. The following weeks are...

Inelastic scattering (π -p)

(3)

E_i (isobar energy)	E_o (incid. neutrons energy)	$\sigma_{in}^{M.R.}$
100 Mev	250 Mev	1.05×10^{-27}
150	350	0.40×10^{-27}
200	450	0.24×10^{-27}
250	550	0.84×10^{-28}
300	650	0.58×10^{-28}
350	750	0.33×10^{-28}
400	850	0.15×10^{-28}

(There was an error in the result that I showed you at the Airport; σ is not $\sim 10^{-25}$ but $\sim 10^{-27}$ as you see).

Elastic scattering (π -p)

E_o	$\sigma_{el}^{M.R.}$ (weak coupling)
250 Mev	1.44×10^{-25}
other results in the making	

(calculated) \rightarrow 13.5 Mev 2.97×10^{-24} (Born's approx.)

experim. of Amaldi, Agnoli, etc. } \rightarrow 13.5 Mev 0.694×10^{-24}
Jan. 1947

However for $E_o = 13.5$ Mev Born's approximation is not good.

I am making a thorough calculation from 20 Mev up to 800 Mev with M.R., pseudoscalar and Schwinger's theories.

I shall also see the variation of σ with the meson mass.

P-P scattering is also being calculated and I want to compare with Wilson's recent experiments. I am sending a note to the Phys. Rev. and will have another one a little later on p-p scattering.

I sent you four letters up to now: one from England (Sittler, I think), another from Florida, Argent. and two others from Cordoba. These went air mail and registered so I hope you

Leite Lopes to Guido Beck.

UNIVERSIDADE DO BRASIL
FACULDADE NACIONAL DE FILOSOFIA
DEPARTAMENTO DE FÍSICA
Av. Thales Antonio Carlos, 40.

Rio, 18 August, 1947.

My dear Beck:

We all were very happy in having received your news. And it is we who should thank you for the magnificent job that you have done during your stay among us. We only regret that we were not able to offer you more comfort but I do hope that our University will progress in the correct direction. Many thanks for the reprints and for the excellent article on full-time which I already received. I told Paulo Sergio the problem that you suggested; he was only waiting for a copy of your "Espacios físicos" and so I hope he already started investigating it. I will do my best to push him forward. As to his fellowship, the situation is now as follows: the Argentine Government offered two fellowships to our Government. Our Rector then indicated officially Paulo Sergio's name as one of the two candidates. The indication must be by now in our Ministry of Foreign Affairs and Paulo Sergio is keeping the track of it. The name of the Argentine department which offers the fellowships is Comisión Nacional de Cultura. The fellowships are offered for 1948. But if you and Dr. Gaviola show interest in having Paulo Sergio now to the Comisión, they may anticipate the fellowships. I suppose that the above Comisión is a department of the Argentine Ministry of Foreign Affairs. Perhaps it would be helpful if you wrote to the Comisión about Paulo Sergio if after the indication reaches Buenos Aires. I will write you as soon as I know that it was sent to B.A.

My "concurso" was opened and I should have my Thesis ready and printed by January 15. So I do not know whether I would be able to spend October or November in Cordoba. However, an invitation was sent by Dr. Almeida to Costa

Ribeiro for the next La Plata meeting of the A.P.A. (September 16, I think). Costa Ribeiro wants to send me to this meeting. In this case it would be o. k. because it would not be so near the date of closing of inscriptions to the "concurso" and I would have October, November and December for writing the final manuscript and printing it. And this as long as I do not stay for more than 20 days in Argentina. I am already working on the thesis. Hope to write it by October and send to print by November so that everything be finished at the end of December. I intend to make a thorough re-examination of $n-p$ and $p-p$ scattering with special attention to high energies.

I finished the calculation of the $n-p$ scattering at 14.5 Mev (Wilson's experiment, Phys. Rev. April 15, 1947). Timmons investigated the problem in the Schwinger, pseudoscalar and vector meson theories. I investigated Møller-Rosenfeld and Hulthén's non-symmetrical theories, the latter reducing to the scalar case in the g^2 -approximation for $p-p$ scattering. I thought it would be good for Timmons to become familiar with this kind of calculations and he worked very well. The result is: all theories investigated give bad results except M. R. and Schwinger theories. Møller-Rosenfeld gives the best curve for a meson mass $\sim 250 m$ assuming the same coupling constants as in the deuteron problem (symmetrical theory). The best result seems to be given by Schwinger mixed potential although Timmons did not yet finish the numerical computations. The M. R. curve and the experimental points are as follows (fig. 4). The others are in worse discrepancy, except perhaps Schwinger's. We are going to send a note to the Phys. Rev. I am investigating other aspects of the problem.

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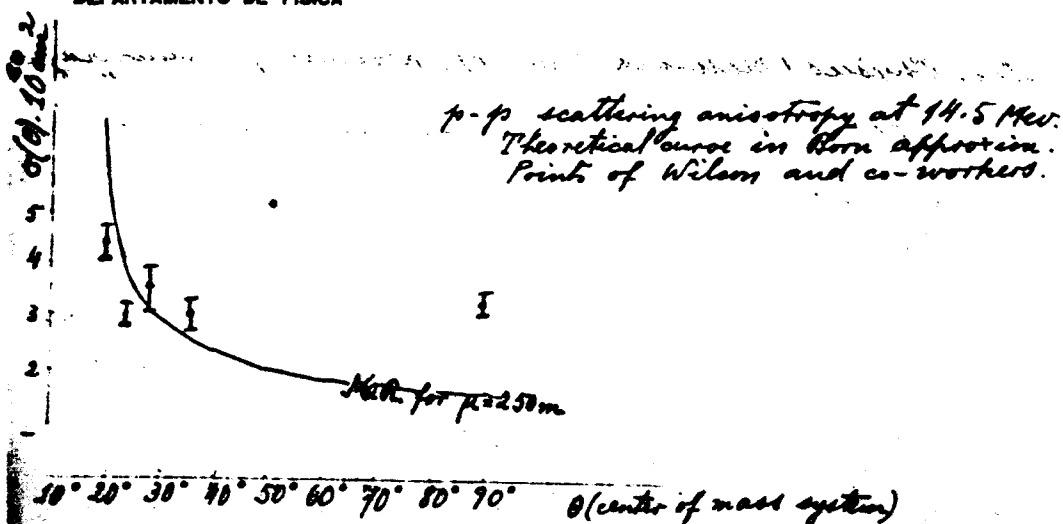


fig. 1

including the effect of assuming neutral mesons mass of charged mesons mass in $n-p$ scattering. You see that the 90° degree-point is very far from the curve. It seems that it is better in Schwinger's case.

Tiommo left for São Paulo two days ago. He took a rest from the calculations you had suggested him and so I proposed the above problem in Schwinger's theory. He did it well and we hope to have all concluded in these days. Tiommo hopes to finish the problem you proposed to him in São Paulo.

I proposed a problem to Paulo Sergio (you were still here) namely to calculate $n-p$ scattering at 14 Mev with a potential well with tail (Richard and Bohm) and also the effect of it in $p-p$ scattering. He did not do a thing so far. He did not even give the manuscript of his paper on spin for publication. Last month while Tiommo and I and the other fellows were working hard, Paulo Sergio was in Teresopolis. But I am patient with him and hope that he will go on all right.

Last week we started our Seminars again. Gross is all right and comes regularly

and is very interested in them. I like him. The following Baby Seminars are running: Nuclear Physics (Mattauch-Flügge), Herwasi, Cosmic Rays (Heisenberg), Elisa; Introduction to Quantum mechanics and then Theory of nuclear reactions, I give them. The last two I am offering to people from our Faculdade, from the Navy, from the School of Chemistry and from Engineering. I am having about 20 people in Quantum mechanics and I am giving it from Planck's theory so that they can follow everything O.K. We have announced all seminars in the press and in the schools and I think that things are going pretty well. Paulo Sergio exposes Dirac's chapter on collisions and hopes to finish afterwards the second part of Mott-Massey's book.

Our Seminar of Thursdays continues O.K. Fialho and Elisa work on counter circuits. My room at the Faculdade is getting material. And so our momentum has increased.

I made the report on full-time, to be signed by Chagas Costa Ribeiro and myself, since the former two did not do it. I gave it to Chagas who should give me back to-morrow. Moses is a grand fellow and wants to get full-time for me at least.

As to Herwasi's fellowship to France for him to work with Rosenblum, I thought it safer to ask it to Mme. Mineur. I am not sure about Guggenheim since what happened with Gross. Herwasi has already filled the application and given it to Mme. Mineur together with a letter of recommendation of mine. She said that it was a bit late but that she would ask Rosenblum that he get a fellowship for Herwasi from the Centre National de la Recherche

5

UNIVERSIDADE DO BRASIL
FACULDADE NACIONAL DE FILOSOFIA
DEPARTAMENTO DE FÍSICA

Scientifique. Hervasio indicated your name for recommendation. I think that a letter from you to Rosenblum about him would be a great help to our goal. Hervasio's complete name is: Hervasio Guimarães de Carvalho, he is a Chemist from the School of Engineering of Pernambuco and is at present Head of the Section of Spectrography of the Department of Mineral Production of our Ministry of Agriculture. He wants to work in nuclear physics and here he does what he can about it. He is about thirty years old. It is probable that Rattes also write to Rosenblum about him.

Mario wrote me and offered for me to spend from 10 to 15 days each month in São Paulo. I found it more advisable not to go now, because of my thesis and also because of the Seminars which started again. If I leave now I feel that things might fall off. It is better that the new people first get the habit of serious and continuous work. After they are confident and sure of the seriousness of our purposes then I may leave for some days.

I was sorry in knowing the new difficulties that you found there. Although I would be and am very much interested in getting little I feel, as you know, not only that I have to settle Rattes' position but also to settle the question of full-time and more guarantees for a foreign professor. Once Rattes is captured by us then we will be stronger to make pressure for getting other physicists and other conditions.

Proca wrote to Monteiro saying that he had written me but I did not receive the letter. He says that he would appreciate coming although he has to settle his position in Paris.

DEPARTAMENTO DE FÍSICA
INSTITUTO NACIONAL DE FÍSICA
RUA DO MAR, 93 - JARDIM BOTÂNICO
RIO DE JANEIRO, 22451-900

I already made an official report to Costa Ribeiro saying that in view of the good results obtained with your visit, Proca and Teller should be invited to come to Rio next year. I will continue working to get them.

By the way, Dean Carneiro has read your report in a meeting of the University Council. And I quoted a part of it in the report I made for full time.

Could you get a reprint (or some of them) of Sittler's article in *Ciencia e Investigação* on the meson? It would be nice to distribute it to the boys here.

I am anxious in knowing your news and the development of the situation in Argentina, so do not forget to write me from time to time.

Best regards to Sahade, Estrella and Kowalewski.

Carmita and José Sergio join me in sending ^{you} grande abraço.

Best wishes and saudades from the boys and from your friend
Reite Lopes

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REPUBLICA ARGENTINA
COMUNICACIONES DE LA NACIÓN
MINISTERIO DEL INTERIOR

EL PROFESOR BECK OBSERVATORIO ASTRONÓMICO CORDOBA

Observatorio _____
Domicilio _____
Destino _____

RIO JANEIRO 450/1421-16-16.35 = DIFERIDO =

FOR *L. Leite* *17/1* *12-2-18* RECHO

LATTES GOT THE MESSONS WE ARE MADLY HAPPY

LEITE LOPEZ

DE LA TRANSACCION EN B 17X

Telegram from Leite Lopes to Guido Beck.

M. de J. e I. P.
OBSERVATORIO DE CORDOBA
Córdoba - Argentina

B.A. 14. 3. 1948

My dear Leite,

Lots of thanks for your cable.

CONGRATULATIONS TO ALL OF YOU. I feel as happy as you do. Physics is becoming thrilling. I'll be in São Paulo Sunday next and I trust to get more details there. And I trust to stay soon with you, either in Rio or in São Paulo.

Here I used Lattes' mesons immediately in order to make lots of noise. And I feel sure, that you will succeed in using them, among other things, in order to make Rio safe for physics.

Até breve. Abraços e saudades.

Guido Beck

Guido Beck to Leite Lopes.

Al^{te} Alexandrino 882 / apt. 203
 5^{ta} Thereza
 Rio de Janeiro.

Rio, July 18, 1948

My dear Beck:

I finished my concursos yesterday. I was very lucky in my exams and so I got the highest degree from everybody in everything. And now I am permanent professor. Now, forward!

Wataghin was here for a few days and told me the story with you in S. Paulo. In my opinion, the situation there is serious and one has to do everything to fix it. But I think that it will not be fixed as long as they do not offer Lattes a convenient position as a Professor of Nuclear Physics and as long as they do not turn their attention to the young elements and to the formation of good students. (In my opinion, the Direction of the Department should be given either to Wataghin or to Lattes!). Let us wait and see. In the meantime our efforts in Rio go on steadily. Many seminars and new boys with enthusiasm and interest. Lattes is preoccupied with his possibilities in returning. And we continue working hard to capture him to Rio. We are going to propose to the Rector the creation of a new chair, Nuclear Physics, for Lattes. This has a good chance to be done. On the other hand Chagas, of the Biophysics Institute, is going to buy a Van de Graff, to be runned by both his Institute and our Department. So I wrote him an official letter giving our support and saying that the Nuclear physics research connected with the machine should be headed

by a man like Rattes; and so the University must offer him good position, with full-time, and invite him to come down. Chagas has sent this letter of mine to the Rector. And now we only have to convince the Rector that he will be a double here if he buys both the generator and Rattes and so gives Brazil a good chance in both Biophysics (radio-isotopes) and Nuclear Physics.

No answer so far from Guggenheim. I know some people who got a negative answer more than a month ago. Would the letter addressed to me have been lost in our Post Office? I wrote Dr. Mac yesterday asking what is cooking the decision on my Fellowship. On the other hand, Tiomno wrote me the following: someone of the Guggenheim told Wheeler that he was well impressed with me but that, in view of the present situation of physics in Brazil, it would perhaps be better that I did not leave Rio now but one year later. This is also, by the way, the opinion of Rockefeller's Miller. This is, of course, reasonable and I am willing to hold myself here longer if I get some help later (in a year or so). I want to stay together with Rattes, if possible, and with Tiomno. We have been working in collaboration and exchanging ideas quite well lately and if we can work together with enthusiasm I am sure we can do a lot. Let us see. In the meantime, work and noise, noise and work.

By the way, I would like to have you here for next year. I am going to propose Costa Ribeiro that you be invited on a full-time basis (the full-time barrier has to be penetrated!).

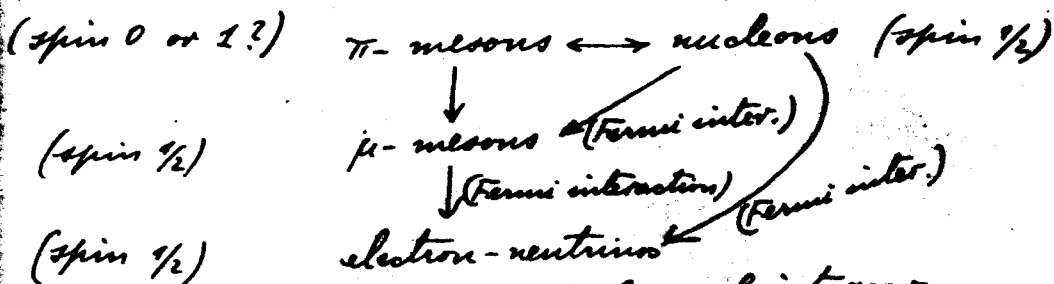
There are great hopes that our salary will be increased from 4.500 cruzeiro to 8.500 cruzeiro a month (without full-time). This is under discussion at the Parliament (a general law increasing all salaries). Tell me whether you would accept coming and which are your conditions (this time we may go directly to the Rector to ensure that there will be no delays or quarrels between the Rector and the Faculdade). (And I can do more noise, if anything happens...). My plans are that you be here for the whole year.

x

Tiomno and Wheeler have done nice calculations lately. They found that if one assumes spin $\frac{1}{2}$ for μ -mesons (μ^\pm, μ^0) and if their interaction with {electrons, neutrons, nucleons} is of the Fermi type, then they can account quite well for { β -decay of μ -mesons, capture experiments (Conversi et al.)}

I have then assumed spin 0 (or $\frac{1}{2}$) for π -mesons and calculated the formula for the decay: $\pi \rightarrow \mu + \mu^0$.

If the lifetime τ_π of this decay is between 10^{-8} sec and 10^{-11} sec, then the coupling constant of the π - μ interaction will be between 10^{-7} and 10^{-5} (in $\hbar c$ units). I proposed Wheeler, Tiomno and Lattes the following scheme of interactions which seems to me satisfactory:



I also sent my thesis (for concurso)
 "Sobre a teoria das forcas nucleares"
 to Gonzalez Dominguez for publication
 as a monografia at the University of
 B. A., as he and B. A. boys asked me.
 Did he receive it? I am sending a
 copy of this thesis for you. Please write
 Gonzalez Dominguez asking whether he
 received my manuscript. I wrote him
 then asking to inform me whether he
 received it.

I am writing now Hirschmann,
 Jonardi, Alina and the boys. I was
 late in doing so because of the exams
 of the students (1st partial exams) and
 because of my concursos.

Did you see Klein's paper, Nature,
 June 5? P. Sergio (here for some weeks to
 get his passport to go to you) is making
 a seminar with me on Tomonaga's and
 Schwinger's papers.

Hope to hear from you soon.
 Tell Pibe and Alina that I had no
 time to give you the cigarettes they gave
 me for you. So I am smoking them.

May I? Best, best regards to Sakade,
 Platteck, Pibe and Alina. I remember
 them with saudades. How is Pibe's
 experiment with the plates? Make him to
 write Lattes.

Best wishes e um grande
 abraço do amigo de
 sempre
 Leite Lopes

Córdoba, July 26th 1948

M. de J. e I. P.

OBSERVATORIO DE CORDOBA

Córdoba - Argentina

My dear Leite,

Lots of thanks for your thrilling letter of July 18th. And congratulations to your concurso: this is, indeed, one of the most fortunate steps towards the consolidation of physics in South America. Let's hope that others will follow in other places. And lots of good luck for the output of one of the few stable cátedras there are here.

As far as São Paulo is concerned, I agree with you that things do not look well. What is lacking there, first of all, is the understanding of the young people that, if they want stable institutions to work in, they have to fight for that and conquer them. Spirit among them is pretty poor. I do not think that things can be changed there from above. One has to work there from below. - I do not agree with the way, Wataghin wants to settle "my" affair there. I have very much the impression that he is reasoning in terms of a few contos. There is no affair "of mine" there, nor are there any contos to bother about. There is one of the usual South American political rectors who sees "political" strongholds instead of working Institutes, who is in personal trouble with one of the professors and who is unaware of the strength that any well working Institute represents and has to represent. Nothing more. And one has to teach him, that, whether he likes it or not, he cannot do with an Institute just what he pleases, and he has to be taught in the only language he understands. That's why I cannot accept that the so-called "affair" be either dropped, or turned into a request for a few contos. Because this would mean implicitly, surrender to the spirit of these people. - I do not think that there is real danger for the existence of the São Paulo Institute. The Institute may run, for a time, into serious difficulties. But if the young ones react and their spirit improves, the price to be paid may be worth while.

I got a letter from Ciencia e Investigación that a contribution of yours has been received and that they appreciate it very much. Further I heard, indirectly, that a monography of yours has been received by the University of B.A. and is already under press. This may be the manuscript you have sent to Gonzalez Dominguez. I have asked, that more reliable direct confirmation be sent directly to you. But don't wait ever for a letter from Gonzalez Dominguez. He is a nice fellow and may even smile politely if you kill him. He may even admit that you are quite right to kill him. Still he won't answer.

The situation I found here is better than I had expected. Our observatory looks pretty safe now. And the universities become more quiet. I am trying to explain to the boys that we are going to have a quiet period for a limited time and that this period has to be, very urgently, used in order to get as much work done as possible. And that they have to expect, afterwards, not to be paid by glory and comfortable life, but by new trouble and danger and that they will have to be prepared to fight to death in order to protect what they can build up.

Guido Beck to Leite Lopes.

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M. de J. S. P.

OBSERVATORIO DE CORDOBA

Córdoba - Argentina

In Tucumán I found, that there is fair hope to get Sitte there. In this case I have committed myself to go there too. You have seen Tucumán. It is not too attractive. But we need urgently modern experimental work and a laboratory where it can be done. Sitte would mean that we get it and that we can form a small group of young people. Tucumán is the only place where we can get that. It is true, that, after five years here, they would accept me in B.A. and La Plata. They might even be ready not to wait any more until I come to ask the favour but to send me a nice letter. But they would be far from accepting conditions for work and nothing could come out. In five years from now it may be different. I just got an invitation from the B.A. University to lecture there for six weeks. My answer is that I will come, but in an informal way and without being paid, because I cannot accept any official invitation before they have settled the question with Heisenberg and Sitte. Simultaneously I got an invitation to give a public lecture on "artificial production of mesons" in the Sociedad Científica Argentina. This is the first time I come in contact with a greater public in B.A. And September 19-20th we have to be ready for the 12th meeting of the APA, here in Córdoba. You see, it's a lot of work.

In Tucumán I told them, that I have never seen, here, an institute working for more than one generation and that it was not worth while and did not justify the expenses and the work, to build for so short a time. And that a chain of institutes has a better chance to survive than a single institute which can become captured by individual interests. Alsina and Battig are at work now, both with questions related to the Cherenkov effect. I was not satisfied with Alsina's spontaneous approach to research work (general stuff concerning fundaments of relativity). Alsina passes through a depression but he is a good fellow and willing to do work. Now he calculates the Cherenkov radiation of a Dirac electron with second quantisation. This should give the old TAMM & FRANK formula, but with extremely small additional terms, corresponding to the recoil of the electron and to the magnetostatic field of the electron spin.

Balseiro cannot go to Ann Arbor this year, because Uhlenbeck goes to Holland and will not be back before 1949. Bloch has cabled me that he is willing to accept Balseiro in Stanford. Thus, Lattes will have him just next door.

The Pibe does not get yet any money. He feels so depressed about, that he forced 4000.- pesos, obliging Sabade to sign a guarantee, in order to pay cash a microscope for measuring his plates and for being independent of Gans! That's the type of boys we need. For the moment Platzek has here another boy of the same type from La Plata.

I trust that we will have Paulo Sergio here soon. Tell him, please, if you see him, that he shall write to me at time, because I will have to travel quite a bit in these days. If he comes a few days before September 1st, I can put him to work before going to B.A. for a fournight. If he wants to come a few days after the 1st, I can meet him in B.A. At any time, he will be welcome and things will be arranged for him, but he shall write at time.

LL7-2 TIF

- 3 -

M. de J. G. P.
OBSERVATORIO DE CORDOBA
Córdoba - Argentina

I have seen Klein's paper in Nature. It looks strange to me. Do you believe that a nucleon consists of 17 mesons?

Thanks for your informations concerning the scheme with π and μ mesons. It looks very interesting to me and will now permit to be checked.

I have learned, lately, a little bit about nuclear forces, but I feel still too weak to try to do something in this sense. While I was in Tucumán, I tried a new trick with the Dirac electron, which seems quite funny. I want to write the classical equations of motion with spinors, instead of using four-vectors. This should be equivalent, but should give directly the classical form of Dirac's equations, or, better, the Dirac form of classical equations. I should like to have that, in order to see whether this can give new arguments for the "interaction ansatz" with the e.m. field. But it will take a while, until I find time to work it through.

I agree that you smoke my Columbia, but I think that it would be fair, in this case, if Paulo Sergio would bring me just one package of 17.

And, finally: I shall try to do my best to bring Monteiro here, but, please, let me know how things are in your faculty: is there any hope to get Monteiro's contract through there?

Thanks a lot for your kind offer to do something for my eventual coming to Rio in 1949. If I can spare a few months here, I would be delighted to stay with you, but if Sitte comes, you will understand that I have to do everything here to keep work running. Therefore: if you can get somebody for the whole year, don't hesitate to drop me. In the contrary case, I shall be glad to come for a few months without considering the money question as very important.

Compliments to Mrs. Carminha e um grande abraço do seu amigo.

Severo Berk

PS: Letter will certainly need considerable time to get from the cyclotron but what can be got, but you are quite right to start already now the necessary preparation of the spirits. But is, in this case, the rector the right person to be considered (or made) the highest deciding authority? Could it you or others touch government people and deputies to press the rector from above?

Rio, February 2, 1949

My dear Beck:

Many thanks for your letter from Pampa de Achala. I miss such a quiet and nice gathering for work; for nearly two months I have been engaged in organization problems, making pressure and trying to find out, together with Lattes and others, a way for physics working seriously and smoothly in this country. Lattes is back in Berkeley and we have been trying to keep the momentum here. Here is how things are now:

- 1) we are in agreement that both Rio and São Paulo Universities have to develop locally, as they can, their physics departments; 2) our universities are however, nearly always, ruled by men who care only about their political interests; 3) the problem of research, as something of national importance, cannot therefore be solved within such universities - which are narrowly minded and do not think in national terms -; 4) but the country is poor and does not admit that all universities in each state have a cyclotron just because another one has it and it is nice to have one; 5) what to do then?
- 6) let us try to organize a kind of Brookhaven, a national laboratory, which would cooperate with the existing universities, would stimulate them, but would receive donations from everywhere to have the most expensive things etc.;
- 7) the idea is bright but the problem is now to get everybody working for it and working really, energetically, seriously, above any vanity feeling etc.;
- 8) this is where we are and plans are now under study. Let us pray for them. I have faith. But things are still confidential!

to avoid passive resistance and what not. Lattes is expected in early March; he will stay here for at least one year (partly in São Paulo and partly in Rio). And I should leave before the 25th of this month. Proca's contract was approved and we wait only for his word saying when he will arrive (we suggested the period from April to December). Auger was here for a week; he will talk with Proca about it. Besides Proca, we got 4 other contracts for our Department including Paulo Sergio and Nachbin (the Math. Department is in a terrible crisis; they ejected Monteiro and did not renew Nachbin's contract, who is in Chicago, and this is a treachery). São Paulo is without Wataghin until June - he is in Italy now - and we have no news from Mario. Paulo Sergio was contracted to be an assistant to Proca and to work under him. Your information was very good for our guidance and attention.

I hope the permit for my going abroad will be given in a few days. Please tell Gonzalez Dominguez or someone else in B.A. that if my monography was not yet sent me, that they would better wait until I am in Princeton and send my copies to me there. I will write you from Princeton giving my address. I need a new commutation on research again in a nice quiet place and this is what I am going to do, I hope. Things are on their way here and Lattes will lead them more efficiently still. His prestige is pretty great here and he has a name for doing good things for our physics.

Monteiro is waiting for answers from U.S., Mexico, England and San Juan. He also waits for a letter from you.

I will drop you a card saying when I shall leave.

Best regards to all of our friends.
Best wishes and um grande abraço from all of us. Seu dedicado amigo
Lattes

P.S. May be Rio will see you in the middle of the year. Wait and see. (I mean Rio de Janeiro city).

THE INSTITUTE FOR ADVANCED STUDY
SCHOOL OF MATHEMATICS
PRINCETON, NEW JERSEY

March 26, 1949

My dear Beak:

Your letter of February 14 reached me after some delay. It was sent by Monteiro to Recife - where I went to leave my boy with my family - and from Recife it came to me here. I arrived about a month ago. Many are here: Yukawa, Uhlenberg, Placzek, Pais, Dyson and about 20 young theoretical physicists. A few days ago Lattes was here and we had dinner together with Oppenheimer, Møller and Aage Bohr. The other day I talked about you with Bartlett, who is also here. Møller and Mrs. Møller told us about your love life and your Danish weddings.

I am now studying the Tomonaga-Schwinger formalism and trying hard to extend it so as to include strong interactions. I talked with Oppie, Pais and Yukawa about it and they find the problem very important. It looks, however, difficult; let us see. Wentzel, Teller and Rossi were here giving seminars. Wentzel made some calculations pointing out that if π -mesons have spin one they should come out in the cyclotron strongly polarized. Teller is working on a theory of Fermi's on the origin of cosmic rays (still unpublished, as lots of other important works are). And Rossi has some results which, although not yet conclusive, seem to point out that π -mesons have a weak interaction with matter for absorption (et voilà! la mess).

Pauli, Tomonaga and Klein are expected at the Institute next September. Vallarta is also here. Pauli wrote a letter to Schwinger pointing out that the latter's calculation of the self-energy of photon and of electron is ambiguous because of the occurrence of singular functions. One needs to introduce a regularization process - which Pauli does - and then everything is all right (see Schwinger's II paper). Dyson showed that a theory of Feynman (unpublished) is simpler than Schwinger's (see Dyson, Phys. Rev. February 1).

Another result I would like to mention you is one of Bargmann: he shows that two different potentials can give rise

to the same phase shift in scattering - hence to the same S-matrix. He and a mathematician from Harvard, Levine, I guess, found conditions for this not to happen. Write him if you want to find out more about it.

Lattes is back in Brazil and will stay there for about 4 months. Many people here are willing to go there, e.g., C. Morette, Feynmann, Yukawa, et al.

I received no news from Proca and I only hope that Costa Ribeiro will get him.

As for Paulo Sergio, he was proposed for a contract in Rio and duly notified of it. You tell me you asked Marcello for him to stay in Cordoba some time more. It is all right but he must make up his mind whether he is willing to stay and write people. And tell him I please that such a contract does not mean he is indispensable anywhere. It is only for his good. If he wants to have a future life in physics, as in anything else he should treat people decently. Otherwise, beat it! and go to hell.

I met Santalo' (he is leaving for B.A. in one or two weeks). He is going to look for Montem in Rio. I heard from Nachbin (now in Chicago) that Purdue Univ. should have made an offer to Montem.

Please tell Gonzalez Dominguez (Madame Levisque' is a good nick-name for him since he hates writing letters) to send my thesis for my present address.

I shall look forward to hear from you soon. Best regards to our good friends, Placzek, Sahade, Balslev, Pibe, Cecilia, Estrella, Alaina.

Our best wishes for you.

Um abraço do amigo sempre seu
Reite hopes

Rio de Janeiro, 26.2.57
Av. Atlântica 896 - Apt. 704

Caro Leite, cara Maria Laura,

Muito obrigado pelo seu cartao do ano novo e melhores votos para Vooes. Tenho vergonha de responder tao tarde, mas...

Estou de volta na Capital Federal depois de 15 meses no "interior". Nao gostei nada de Sao Paulo. A faculdade nao é ma e a cadeira de Wataghin e de Bohm é um instrumento de valor. Mas a administracao é muito argentina e uma pessoa sem reservas grandes nao pode viver com suficiente tranquilidade para poder fazer com êxito tudo o trabalho que faz falta. Tratei de reestruturar os cursos da cadeira para ter pelo menos um minimo de garantias que os estudantes possam ver o minimo indispensavel do que é agora a fisica teórica. Havia passado que turmas inteiras sairam da universidade sem haver visto o segundo principio e as equacoes de Maxwell. E ainda numa universidade que tem mais pessoal capaz para fazer um ensino brilhante que qualquer outra neste continente.

Quando sai de Sao Paulo explodiu o Instituto de Fisica Teórica (Leal Ferreira) e o Mario comprou os fragmentos. O Molizé ocupa atualmente a cadeira, mas quer voltar para Genebra (CERN). Temos dificuldades para arranjar o dinheiro para a sua viagem com a familia. O Jeon e o Güttinger estao com o Mario, com bolsas do Conselho. O Departamento é logo bastante forte e trata de trabalhar.

A coisa de mais valor que achei em São Paulo se chama H. M. Nussenzweig. O fiz calcular um problema de difragão, depois de haver simplificado o problema da antena que quiz resolver em Paris. O Nussenzweig, dentro de 15 meses de trabalho resolveu o problema rigurosamente e esta solucao da tudo o que ficou depois do trabalho de Sommerfeld em 1897. Da a transição entre fenda larga e fenda estreita, a conexao com as correntes quaziestacionarias, permite controlar as formulas de Kirchhoff e ver donde falham e como falham, da pela primeira vez a influencia dos bordes para um problema de ótica e abre a porta para a solucao rigurosa do problema da antena. Ja tem 80 páginas de manuscrito, faltam 40 páginas mais. O Nussenzweig é o rapaz mais prometedor que achei desde que comeci a minha carreira. Naturalmente levei a ele ao C.B. P.F. comigo. Quer que resolva ainda o problema da antena e depois deve ir a Europa.

Aquí no C.B.P.F. o clima de trabalho é favoravel, mas devemos fazer tudo para impedir que seja outra vez arruinado por brigas pessoais. Sem eso nao ha esperanza alguma que algo de bom possa sair de aqui. Combinei com o Tioanno que vou fazer este ano o curso de mecânica quantica e que o Nussenzweig vai fazer um curso de electrodinamica II, principalmente ótica. Ja fiz em São Paulo um curso esplendido.

Eu estive com um problema de condutividade que ainda devo proseguir. Mas vem o Zocher com a dona Clara, chorando que nao se ocupam das consideracoes de simetria do Zocher. Tratei de mirar porque é achamos coisas

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bastante sorprendentes na inversão do tempo nas equações da física. Terminamos um primeiro trabalho pequeno que será pronto publicado. Mas ficam ainda muitas coisas para ser aclaradas.

O Hussensweig terminou também um pequeno trabalho com o José Goldenberg sobre a difração no tempo (de Machinsky) que será publicado no México. É uma consequência das discussões no México neste verão.

Estou bastante satisfeito com os resultados sobre a paridade. Não compreendi nada quando o Wigner me quis explicar que não se podem misturar estados $s_{1/2}$ e $p_{1/2}$ por razões a priori, sem verificação experimental. Agora estou mais alegre.

Que fazem Vocês? Passavelmente, na física e na matemática?

Diga muitas lembranças ao Feynmann e recebam um cordial abraço de

Guido Beck.

Guido Beck to Leite Lopes in Pasadena.



Der Präsident der Technischen Hochschule Darmstadt

PROFESSOR DR. HELMUT RÖHME

Darmstadt, den 17. Januar 1977

Sehr geehrter Herr Lopez,

die akademische Feier anlässlich der Ernennung von Herrn

Professor Dr. Guido B e c k

zum Ehrendoktor (Dr.rer.nat. h.c.) unserer Hochschule, findet am

Freitag, 4. Februar 1977, 17 Uhr c.t.,

im Senatssaal (Zimmer 771) 7. Stock

des Hauptverwaltungsgebäudes

statt. Namens der Technischen Hochschule Darmstadt erlaube ich mir,
Sie zu dieser akademischen Feier herzlich einzuladen.

Mit freundlichen Grüßen



61 Darmstadt, Buchschr./ph. Telefon (06151) 161, Durchwahl 162220

The President of the Darmstadt Technischen Hochschule to Leite Lopes in Strasbourg.

MINISTRE DE L'EDUCATION NATIONALE
UNIVERSITE LOUIS PASTEUR

ulp

CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE
INSTITUT NATIONAL DE PHYSIQUE
NUCLEAIRE ET DE PHYSIQUE DES PARTICULES
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CENTRE DE RECHERCHES NUCLEAIRES
DIVISION DES HAUTES ENERGIES
67037 STRASBOURG-CEDEX
(France)

L. (85) 29.90.33
LEX 880032

31 January, 1977

Professor Dr. Helmut BÖHME
Der Präsident
der Technischen Hochschule Darmstadt
61 DARMSTADT, Büchnerplatz
RFA

Dear Mr. President,

Thank you for your kind invitation to attend the ceremony
of the granting of the diploma of Dr. rer. nat. honoris causa to
Professor Guido Beck on 4th February.

Unfortunately, your letter, dated January 17, reached me only
today. I am therefore, in view of previous engagements, unable to accept
your invitation.

I pray you however, to please convey Professor Beck my
homage.

I know quite well of Guido Beck's high value and dedication
to scientific research. For many years we have been colleagues in Rio de
Janeiro and it was I, as head of the Department of Theoretical Physics
of the Brazilian Center for Research in Physics, who invited him to join
our group and become Professor in our institution. This was more than
twenty-five years ago just after I had the occasion to contribute, together
with some colleagues, to found the Brazilian Center for Research in
Physics in Rio de Janeiro.

.../...

From Leite Lopes to the President of the Technische Hochschule Darmstadt.

As a Professor of Theoretical Physics at the Federal University in Rio, just appointed after my doctoral work in Princeton, in 1944-1945, it was painful to find out the existence of a lack of support of scientific research in my University and of great difficulties opposed to the formation of dynamical groups of scientists.

At the same time that my colleagues and I continued to fight, as we could, for the development of the new Centre, and of Physics in our country, I enjoyed working at the side of Guido Beck.

After all these years, when difficulties of almost all kinds were raised against our efforts -and I think as well of the difficult life imposed to many colleagues from other countries in South America- it is gratifying to know that Guido Beck is still able to go on working in Brazil and, moreover, that the merits of this work are generally recognised.

If I regret not to be able to be with Guido Beck and my other colleagues in my country, in the present circumstances, it is good to learn that the efforts and achievements of a colleague and friend are finally acknowledged. I never cease looking forward to the day when the peoples of South America will conquer freedom. Only then will those young men and women who learnt from Guido Beck and his peers be able to contribute fully to a better life for their people and the human fraternity.

With best wishes,

Yours sincerely

J. LEITE LOPES

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TELEX CNRS CRO 890032 F
23, Rue du Loess
STRASBOURG-CRONENBOURG

TÉL POSTE :

Strasbourg, le 26 November 1982

Professor Guido Beck
R. Inhangá 40 Ap. 702
22020-Rio de Janeiro
Brasil

Querido Beck,

Fiquei contente ao receber convite da Universidade Federal do Rio de Janeiro para a sessão solene em que o Reitor lhe conferirá o título de Professor Honoris Causa da mesma Universidade.

Envio-lhe meu grande abraço de felicitações e lamento não poder estar no Rio para participar da reunião, que será uma reunião de festa e alegria para os físicos do Brasil.

Évoa os tempos idos, quando você veio ao Rio pela primeira vez a convite de Costa Ribeiro e de mim mesmo, para dar cursos e orientar pesquisas na Faculdade Nacional de Filosofia. Ali, estivamos nós a tentar estimular a física nessa Universidade, Costa Ribeiro como pioneiro de física de estado sólido no Brasil (com Bernhard Gross), e eu dando aulas e seminários em mecânica quântica e teoria dos campos.

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STRASBOURG-CRONENBOURG

TÉL. POSTE :

Strasbourg, 10

para que jovens pudessem se preparar para a pesquisa. Ali você teve o Paulo Sergio de Magalhães Macedo como estudante, talvez o seu primeiro estudante graduado no Brasil. E depois, ao fundarmos o CBPF, não podíamos deixar de ~~estabelecer~~ ~~desenvolver~~ no Brasil, com o seu entusiasmo sempre jovem, com a sua cultura, com o seu saber em física e em pesquisas, com o seu amor à formação dos jovens. E assim ao longo dos anos, em meio às dificuldades que apareciam quase a toda hora, vários físicos brasileiros tiveram a chance de trabalhar e aprender com você.

Quantos obstáculos mas também quantas realizações, quantas divergências pessoais entre vários de nós, mas quantas convergências para o desenvolvimento da Física em nosso país e na América Latina! A fundação do CBPF em 1949, do CNPq em 1951, a crise de 1954, o incêndio da biblioteca do CBPF no fim da década de 50, mas o prosseguimento tenaz da luta pela física, a fundação do CLAF, a realização das Escolas Latino-Americanas de Física, as visitas de jovens como Amati, Sirkin e Giambriagi e de físicos consagrados como Feynman,

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TÉL. (88) 29.80.33
TELEX CHRS CNO 890082 F
23, Rue de Lorraine
STRASBOURG-CRONENBOURG

TÉL. POSTE :

Strasbourg, 10

Viguer, Yang e tantos outros. Ao mesmo tempo, continuei a fazer o trabalho do ensino na Faculdade Nacional de Física, onde você se juntou a nós, na cadeira de Física Teórica e Física Superior que eu comparei à época e para a qual procurava atrair, malgrado as dificuldades da burocracia, os jovens de talento no Rio de Janeiro. Nessas atividades, na FNF, como no CBPF, você era o amigo leal, o físico que todos homenageavam, o homem de cultura, sensibilidade e fino senso de humor.

Depois das atividades na Europa, do seu convívio com físicos como Heisenberg, Max Born, Pauli, quiz o destino que você para a Argentina se deslocasse; lá onde você também formou discípulos como Josi Balseiro. E de lá foi nossa sorte atraí-lo para o Brasil.

A Universidade Federal do Rio de Janeiro está de parabéns por saber reconhecer o seu mérito e a sua contribuição à física no Brasil.

Quiz também o destino que, contra a minha vontade, me afastasse do Brasil para poder prosseguir no meu trabalho, impediu de-me o convívio,

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TÉL. POSTE :

Strasbourg, la

com os meus colegas e com os amigos estudantes. Mas, cada dia, está presente em meu pensamento a imagem da nossa experiência passada, o profundo interesse pelo que lá ocorre, a preocupação e a esperança pelo seu futuro.

Um abraço do coração
Leite Lopes

Leite Lopes to Guido Beck, Professor Honoris Causa of the UFRJ (Federal University of Rio de Janeiro).