To Guido Beck
with my most sincere
thanks for the Rio-
time
Yours
Ingmar Bergstrom

Project number 5 for Argentine.

Post number: Non budgetary, Argentine.

Title of post: Expert in nuclear physics.

Final report to the UNESCO-Headquarters

by

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CONTENTS

INTRODUCTION.

The final report presented here, covers the time between October 5, 1958 until June 16, 1959. I left Sweden for briefing in Paris on October 5, 1958 and flew to Buenos Aires via New-York City, where I for five days discussed the Argentine problems in my field with Dr. Tor Ragnar Gerholm, who just left Argentine after a seven months' mission. My duty station was Buenos Aires where I spent all the time except for two and a half months from Jan. 1, 1959, when I was responsible for a summer school in nuclear physics in Bariloche.

During my Buenos Aires time I also regularly spent one day a week with the nuclear physics group in La Plata.

There was considerable confusion about my contract. Originally the so called Arges-5 project involved teaching and research only in Bariloche. The budget of the Argentine Atomic Energy Commission broke down and the financial responsibility of the Arges-5 project was taken over by the University of Buenos Aires (75 %) and the Argentine National Research Council (25 %). A new job description evidently did not arrive at UNESCO in due time. Later I was informed about the content of this job description in which the science faculty of the Buenos Aires university explained that "they were interested in any physicist who would be willing to help them to build up the physics department." What this meant I certainly soon was going to realize.

There was also some confusion about the contract time. I clearly stated to the Argentine authorities and the UNESCO during the time of negotiations that I could not stay longer than until June 1, 1959. The negotiations were delayed and I did not notice that the contract I signed covered the time until Aug. 1, 1959. However, this was never a problem between me and the Argentine authorities and was later straightened up in correspondence with the Headquarters

I would like to emphasize that the dean of the Faculty of Science Prof. Rolando Garcia gave me a completely free choise regarding my work. He was for obvious reasons my main counterpart but there was no pressure whatsoever from his side that I had to devote my entire time to the faculty of science. My final decision to do this was a result of my discussions with Dr. Gerholm in New York and after having made my own observations and con-

clusions in Argentine.

I will try to write this report as objectively as possible, but I would like to emphasize that in the short time I spent in Argentine especially and Latin-America in general I may have obtained a picture of the situation which may be too subjective. In addition things were changing so quickly that there is a possibility that my experiences do not any longer reflect the present situation. I also purposely spent on my way home 1 month in Brazil, 1 week in Venezuela and five days in Mexico and earlier a few days in Chile in order to be able to see how the Argentine problems fitted into the Latin-American picture in general. In the last part of my report I will try to make a comparison between the eductional and scientific problems in physics in those Latin-American countries, where this field of science at all is relevant for the moment.

It is not easy to know the best way of presenting my experiences. I could try to list some of the problems I met which I consider to be the main reason that the Physics Department of the Buenos Aires Department was barely working. Some of my Argentine colleaugues said that the Physics Department was sound asleep. This is perhaps an extreme exaggeration but no doubt it was not what should be expected by a physics department of the largest university in Argentine, a relatively modern country with 21 million people.

The problems I met are not at all so local as they might seem. They are in fact intimately associated with very serious problems on the whole Latin-American continent. My own experiences only refer to research and education in the narrow field of physics. I am convinced, however, that it is possible to extrapolate this easily to other activities of the university life. The problems go deeply back to the history and social structure of all Latin-American countries.

Perhaps a suitable introduction would be to summarize some of the difficulties which are more or less the same in most of the Latin-American universities:

1) The past influence of the church
2) The military influence
3) The political influence

→ meaning a tremendous bureaucrazy of Spanish origin from the 16th and 17th century.

4) A consequence of 1, 2 and 3 are inefficiently working universities and a

tendency to-day to break out new activities from the university organization (where these activities should belong) but where they are not supposed to work because of the extremely poor reputation of the possibility of the Latin-American universities to work efficiently in modern teaching and research.

5) The myth kept alive also by the Latin-Americans themselves, that things cannot be changed in Latin-America.

6) The shortage of internationally acknowledged scientists.

7) The lack of collective thinking.

8) The low academical salaries and the multijobsystem.

9) The passive teaching and the shortage of facilities for experimental teaching.

10) The political influence of the students.

11) The absence of entrance examinations.

12) The little appreciation for time schedules and long time planning.

The difficulties mentioned above do of course not constitute a complete list. Many of the Latin-American countries are fighting hard and successfully in order to eliminate some of the above mentioned problems. In many cases the difficulties are so large that they mean a prohibitive barrier for academical teaching and research in some fields of natural sciences. Those countries who have overcome this barrier to such an extent that research and teaching in physics at all is relevant are the following ones: Argentine, (Bolivia), Brazil, (Chile), Mexico and Venuzuela.

When discussing my mission to Argentine, there will be many reasons to come back to the list given above which, however, is based on my total picture of the whole of Latin-America.

A. Serious problems.

1. Lack of experienced teachers and scientists.

It is quite natural that my main counter part should have been the head of the physics department. When I arrived this position was vacant partly because of some serious personal problems and evidently it was extremely hard at that time to find a suitable person for this position. There might have been some good candidates but they were all in the ages 25-35, an age where they should devote most of their time to research. The missing ages

35-50 certainly, to a very great extent, reflects the neglection of research and teaching in natural sciences of the universities during the former regime. I could not help observing that some persons who no doubt were qualified from the point of view of teaching experience and research, were missing the most essential feature a man like a head of a department should have, namely training and ability to think and take care of collective efforts. To some extent I think this goes back to the education and teaching, where more emphasize has to be put on collective efforts like group and team work giving the students a chance to forget about their own carrier for some time, a period when they would realize that an essential part of modern teaching is a very intimate contact between students and between professors and also between students and professors. This is or was (with the exception of Bariloche) to a very great extent missing in Argentine.

Never before have I realized so drastically what a tremendous advantage and favour it is for a country to have internationally known scientists, who can influence the development of their field because of their authority. Argentine does not in the field of physics (like all the other countries in Latin-America) have a Cockroft, a Fermi, A Joliot-Curie, a Kapitza, a Bohr or a Siegbahn. In physiology, however, they have their Nobel prize winner Prof. B. Hussay and this field is in Argentine as far as I can understand very active with lots of exchange of foreign famous scientists. The result is that in Argentine (like in other Latin-American countries) very young people have been put in administrative positions; a job which they dislike because of their interest in research. A result of this is that they get discouraged after some years and go abroad on a fellowship just to escape and get a chance to go back to science. To get involved in administration is a serious problem for young scientists all over the world but it is a deadly danger in Latin-America where the amount of paper and red tape is orders of magnitude more than in many other parts of the world. Unfortunately Argentine is in this way loosing each year many good scientists. Of course when leaving they are convinced to go back but a few years in countries where the real value of salaries are up till 10 times more, changes very often their opinion.

I consider this vacuum of good scientists in the ages 35-50 years to be the most serious problem in Argentine science of to-day and accordingly

I strongly suggest UNESCO to emphasize their activities in Latin-American science on the expert programme. The equipment and fellowship question is serious but not at all comparable to the question mentioned above.

According to my own experience the main thing is perhaps not the field of the specialist. Of enormous importance is that Argentine and other Latin-American countries get foreign scientists who are willing to try to understand the specific Latin-American problems. Such men will serve as neutral nuclei around which many projects, which before were almost impossible to perform, may crystallize to realities in an amazingly short time. It is evident that all the drastic changes which are now appearing in the faculty of science at the Buenos Aires university and many other places in Argentine means rapid democratic decisions. This is as is well-known hard to do in this very much individualistic part of the world. The presence of neutral experts catalyzes to a very great extent the necessary negotiations and compromises.

Going back to the rapid changes UNESCO should be aware of something I did not realize immediately. What is happening or what I hope will happen is a transition from the old fashioned inefficient Latin university system to a more up to date educational system. If Argentine is going to make any future industrial development this is no doubt the main problem. If the people in the Faculty of Science and the Physics Department of the Buenos Aires University have the courage (which they evidently have) to be those ones turning around a key to a new future, they certainly should be assisted by institutions like UNESCO. It is going to take lots of effort because the door is heavy, the key is rosty and they are still trying to find the right key. There are not people missing who are willing to turn the key around. As a matter of fact sometimes they are litterary spoken stepping on each other's toes to make a trial. It is amazing to experience how relatively easy a neutral specialist, if he has the right attitude, can solve the cew problems. A good university in Buenos Aires would no doubt have tremendous feed back to all other universities in South-America.

2. Low Academical Salaries.

If Argentine will be able to solve all the problems associated with a rapid industrialization, she necessarily has to increase the academical salaries considerably. The salaries of many people in key positions are

ridiculously low. Even if I do not remember the exact figures, I know that for example in Buenos Aires a director of the Atomic Energy Commission has about US $150 a month and the decanus of the Faculty of Science even less. There is lately a tendency of salary increases. So for example had the first year assistents at the physics department slightly less than the decanus! However, all salaries, especially those ones of full time professors and associate professors, have at least to be increased by a factor of two if there is any finite probability to attract good teachers and scientists (who Argentine no doubt has) to devote their work to academical activities.

The result of the low salaries is among other things that most people have three, four or even more jobs. In this way good people's initiative is killed and valuable time spent on busses, trains and even aeroplanes. In one of my letters to the Headquarters I treated the problems of the La Plata group (nuclear physics group initiated by the UNESCO-specialist Tor Ragnar Gerholm now having 11 members) I found to my unpleasant surprise that only one of the members was employed full-time. Most of the others had three or four "Government"-jobs. In spite of this they spent about 75 % of their time in the physics department, who by far contributed least to their salaries.

A direct result of the Argentine academical salary policy is that the Argentine Universities to a great extent are evening schools. During my "briefing" with Dr. Gerholm in New York he told me that he could do something in the C.N.E.A. and in La Plata, because he at least had counter parts. Several times he visited the "physics department" in Buenos Aires but in no case he found anybody around. He strongly encouraged me to try to understand this paradox. One of the reasons is simply that between 9 and 5, normal working time, the faculty was empty, with the exception of a few brave people. I still remember this peculiar desertlike quiteness in the mornings during my first time in Buenos Aires. Where were the students and the professors? Many of them working in other places in order to live! That teaching and learning by exhausted professors and students between 6 and 12 in the night is inefficient is needless to emphasize. The same cathegory of people (including myself) thus came home just before midnight, which of course means almost no family life, naturally creating lots of private problems.

I had the interesting experience to be one of the four members of a jury supposed to suggest five new professors in physics. I could not help noticing that many of the candidates were just those ones seeking a third or fourth job. Because of the low salaries many of the most competent people did not make any applications especially those ones working for the moment abroad.

I was happy to experience a fast change of the "evening school" to at least partly "a day school" during my stay at the Physics Department. I do not mean that this all was due only to my efforts. As well as it was possible I tried to back up brave people who had the courage to try to change. My own contribution was the normal working time schedule for myself and those students and assistents for which I was responsible. The feature of the university being an evening school was also so traditionally rooted that it even was defended by otherwise very broadminded people. However, I am happy to inform UNESCO that there is now a general tendency all over the country to employ only fulltime working professors. So for example agreed the "concurso"-juries of physics, chemistry and mathematics departments independently to suggest with preference those candidates who were willing to devote their whole time to the university. At the time I left, the Buenos Aires University for the first time had about 15 fulltime professors and by now this figure is probably multiplied.

It seems extremely important that the Argentine Government is made aware of the present inefficiency of the Argentine university organization and the tremendous waste of Government money the multijob system means for the country. There is only one way out of it; to increase the academical salaries drastically, which simply means that they get their govermental salaries from one source instead of many. In addition it certainly also requires hard work and a good portion of idealism from the people involved. A salary increase, however, would among other things probably result in the returning of the many clever Argentine scientists "studying" abroad. If there will not be any considerable change regarding salaries the export of the best Argentine scientists will continue. I predict a considerable immigration of scientists to Venuzuela which country is also changing very quickly, but which offers salaries of the order of 10 times more than in Argentine. Even if the living cost is much higher in Venuzuela the savings

which can be made in the latter country is probably much more than ten times the possible Argentine savings if such at all are possible.

3. Teaching and research problems.

Education in physics which lead to a degree is given for the moment in La Plata, Buenos Aires, x Bariloche, Cordoba, San Luis and Tucuman. The places which will be able to stand the pressure of future difficulties so that they can work efficiently are especially the first three ones. As an example of these difficulties I can mention that the director of the Cordoba Observatory professor Gratton was about emigrating to the US because of the low salaries in Cordoba. Professor Plazeck also from Cordoba, one of the best experimentalists in Argentine, has already gone back to Bariloche where he worked before. Tucuman also has difficulties to attract teachers because of its northern position.

The university of the province of Cuyo has problems which in a way are typical Argentine. The main part of the university is situated in the beautiful town of Mendoza, which really has many attractive features of the kind which should be considered, when choosing the position of a university town. However, due to provincial politics the engeneering school was placed in San Juan some 300 kms to the north and the department of physics and a few other departments 300 kms to the east in the little town of San Luis on the middle of "la pampa". For obvious reasons a town like San Luis does not attract teachers very much and for the moment the scarcity of teachers is anyhow very serious. In March I was invited to take part in a discussion in Mendoza with the rector of the university and the head of the physics department about future plans for the physics department in San Luis. This was one of the few times in Argentine that I did not respond immediately and afterwards I know that it was due to an intuitive feeling that before efforts are spread to all parts of the country they should be emphasized in places which in a reasonably short time can produce considerably more people with degrees. In about five years when Buenos Aires, La Plata and Bariloche are producing altogether 70-100 physicists a year (my own estimate) it would be more realistic to use the new generation of physicists in order to increase the level of all the universities.

x Bahia Blanca

I have already mentioned the problems associated with the fact that the Buenos Aires University to a great extent is an evening school. It is natural that professors who have a whole day's work behind themselves are not able to give their best teaching. Furthermore in these late evenings it is perhaps natural that most of the teaching is restricted to blackboard activities. This means of course that theoretically minded students can get along well but those ones with experimental talents will not be discovered and are often lost. I had the pleasure to see how some of these "lost" students very rapidly prooved to be able to work as first class experimental physicists. It is also evident that with all this blackboard activities (a rather passive way of teaching) the contact between students and teachers was not the informal one, which is almost indespensable in order to reach results with modern youth anywhere in the world.

It is often claimed that the lack of experimental teaching in the university of Buenos Aires as well as in other Latin-American countries can be derived back to the influence of the catholid church in the past time. The catholic church has for reasons which are historically well-known put the emphasis in their teaching not only on religion but on humaniora in general. I do not mean that there is no change in this attitude. It is for example very interesting to see how in Rio the catholic university seems to be involved in a period of building up experimental facilities (see IV) similar to that one now appearing in Buenos Aires.

The most serious lack of the physics department at the time I arrived was the almost complete absence of research. Very few people realized that research is the most essential part of modern graduate teaching. The lack of research equipment was of course one of the reasons, but I think it also was associated with tradition. This means that so far to a great extent, at least in the field of experimental physics, the graduate phase has been missing in Argentine, and it means that many Argentines had to go abroad and pay expensively for elementary learning, which they should have been able to get at home. In the field of nuclear physics this problem is rapidly changing, for example because of the good research facilities of the Argentine Atomic Energy Commission. This institution, however, has the apparent drawback of not being formerly associated with the universities and its geographical position of about 15 km from the Buenos Aires University makes for the moment efficient graduate research complicated. In

a relatively short time these difficulties may be overcome to a great extent. First of all the physics departments in La Plata, Buenos Aires and Bariloche are now obtaining nuclear research and teaching equipment. A very important thing in Buenos Aires is also the transfer of the Faculty of Sciences to a riverside lot only about one kilometer from the Argentine Atomic Energy Commission, and it is supposed to be finished within 2 years.

4. The University and the Argentine Atomic Energy Commission.

One of the many sensitive problems I hit in Argentine (often without knowing it immediately) was the relations between the Faculty of Sciences and the Argentine[x] Energy Commission. The historical background of this problem has partly been treated in the reports by Dr. Devons and Dr. Gerholm. To make a long story short, let me just mention the fact that during the Peron-regime, research and even teaching was almost impossible in the universities and many good professors and students were personas non gratas because of political reasons. When the Atomic Energy Commission was created, it also adopted purely academical research, which in other countries frequently exclusively belong to the universities. The research activities thus concern not only nuclear technological problems like prospecting and uranium metallurgy and reactor technology but purely academical research in physics, chemistry, biology and medicine. After the revolution the situation was such that the Atomic Energy Commission had a large budget, lots of good research equipment and more than 1000 people employed. In all these respects the Faculty of Sciences represented an almost perfect vacuum. Many of the people in leading positions in the Faculty were those ones who in principle refused any cooperation with Peron and in many cases went abroad. It is quite natural that when these people were asked to try to get the Faculty running, they hit the most apparent feature of Argentine science to-day, the high potential possibilities at the C.N.E.A. and the vacuum at the universities.

It is not justified that a foreigner takes one side or another in this very complicated and delicate matter. What a temporary visitor sees, however, is what could be done if the past time is forgotten about and if the universities and the C.N.E.A. cooperates. In both places there are people who are pathologically against the other place. Many C.N.E.A.-people are still accepting the mythology that the Buenos Aires University cannot

[x] Atomic

be changed (and they are wrong). In the universities on the other hand there are people who cannot forget about the events during the Peron-regime and who do not want to have any connections whatsoever with the C.N.E.A. Thus living only in the past, these people are "contributing" to the future of their country only through passive and I would say even destructive thinking and talking.

However, fortunately in both places there are also many broad minded people, who realize that what matters is the future of Argentine and not only personal and historical prestige. I was a kind of exchange particle between these cathegories of people. A typical event of this kind was the situation which was associated with my taking part in the physics professor "concurso". In my report to the Consejo Directivo of the Science Faculty I came to the conclusion that many of the difficulties our jury had would not exist at all if the academical activities of the C.N.E.A. were centralized in a National Laboratory supported by the C.N.E.A., the universities and the Argentine National Research Council. This would also give the C.N.E.A. better possibilities to emphasize the technological aspects of nuclear power.

In many of the Latin-American countries, schools and institutes properly working are not directly associated with the universities. The reputation of the universities is traditionally so poor that all kinds of excuses are invented in order to break out these activities from the university organization. It is needless to say that in this way lots of irritation is created between people working for and believing only in one of these possibilities. I am quite convinced that foreign specialists in the Latin-American universities will be of a great importance in order to create respect for the universities and contribute to necessary intergrating activities, which after some years in many cases are absolutely indespensible.

A problem in Argentine science which was discussed very much during my time in Argentine was the future status of the Bariloche school. The Bariloche school of physics is financed by the C.N.E.A. and belongs only formerly to the University of Cuyo. Though things are changing very rapidly in Buenos Aires the Bariloche school of physics is still outstanding in Latin-America. This is not appreciated by many people, the arguments are many and among them the following ones:

1) It is supposed to have been created in a nondemocratic way
2) Its budget is "astronomical"
3) It is too far away from Buenos Aires (1700 kms) meaning that
   a) Research impossible because of separation from the big industries
   b) The students culturally isolated
   c) The studentspolitically isolated
4) The Bariloche staff has economical advantages that the professors in the universities cannot get.

Regarding point 1 I do not think that such an objection is relevant in Latin-America of to-day where everything, which is usable has to be used and where stopping anything which is running properly is a deadly danger.

Objection 2 may still seem justified from the university point of view. I do not think, however, that the solution is to cut the Bariloche budget but to increase to budget of the natural science departments considerably. Very recently the administration in Bariloche was in the hands of bureaucrats, but some brave men had the courage to try to change this. Since then the administration and bureaucrazy has been cut considerably, 50 students should, however, not need a total staff of about 200 people. By cutting down the administration still more the saved money could be used for teaching and research. The present Bariloche staff is aware of this problem and are doing their best in order to reduce the total number of employees. The students in Bariloche are on a full schoolarship plan. For many teachers in the Faculty it is naturally a kind of irritation to see that after 2 years some of their best students leave in order to continue their studies in Bariloche. I hope that in the future it may be possible to increase very much the schoolarship possibilities in the universities.

The distance from the big Argentine industries is undead large. However, I believe that the rapid development of Patagonia, which probably will be the result of the oil rush will soon change the center of gravity of Argentine more to the south, though this probably will take some time. On the other hand it is a fact that in many countries the best research work is done in very isolated places, so personally I do not at all consider this point prohibitive.

Regarding point 3b I simply state that in a way it is completely

wrong. What I experienced during 3 months in Bariloche did not have any correspondence during my Buenos Aires time. Just because of the fact that the students were far away from the cultural possibilities of B.A. they forced themselves to take the most remarkable iniative in order to compensate for this. In my first report to the Headquarters I reported about experiences of this kind. I have also prepared tape recordings for the UNESCO-radio, which will illustrate the cultural activities of the students.

Arguments 3c may not be taken seriously by a foreign teacher for whom the political activities of the students may be one of his main difficulties to get something done. I must admit that in the beginning I was rather chocked about the "political" influence of the students on the university life. However, they should perhaps not be blamed too much and I shall try to analyze this question in the next chapter. However, the "political" activities are especially justified in places which for some reasons are not running. Bariloche is running reasonably well and because of this there is not such and urgent need for political activities as was the case in Buenos Aires.

Point 4 is intimately associated with the general academical salary situation in Argentine. A few years ago a professor salary in Bariloche was twice that of a university professor or more. In addition the Bariloche professors practically have free houses making their real salaries three times higher than those ones of university professors. This drastic salary difference created irritation among the university professors because of obvious reasons. Through the recent increase of the salaries of university professors the difference is not so large but an increase of the university salaries at least by a factor of two seems to be necessary in order to remove this difference. As was pointed out in A2 this is also necessary for other reasons.

In a way Bariloche is run like an English college. It is amazing to see the result. The sincere friendship among students which is created in Bariloche will be of very great importance in a few years when these students will have key positions here and there in the country. These students have what I was missing among people of my own generation; collective thinking and this is absolutely indespensable for the future of development of Argentine science.

I am also impressed by the experiment of having other Latin-American students in Bariloche. Their studies are financed by the Atomic Energy Commission and UNESCO. Typical for the confusing situation in this matter is a suggestion to have a Latin-American school of physics not in Bariloche (which I think would be the proper place) but in Santa Fé. This illustrates a typical Argentine desease of creating new things without using already existing possibilities, because the past of these possibilities are believed to have violated fundamental democratic principles. I sincerely hope that the brave and clever men now in responsible positions are able to handle this sensitive question properly. The extreme solution for which many people are making propaganda, to close Bariloche, would be nothing but a national catastrophy in Argentine science. Argentine is not the only country having institutes formally independent of the universities. A somewhat similar institute in my own country is the Nobel Institute. For the moment there is a committee investigating the most efficient way of cooperation between this institute and the university of Stockholm and the Royal Institute of Technology. I think something similar ought to be done about Bariloche. This would be much more creative than all these destructive corridor discussions. After all it is not a question of Bariloche or the Faculty to survive or not. Argentine needs badly both of them and there should only be one question; the future of Argentine.

5. The political activities of the students.

Since the political activities of the students occupy a considerable part of their time, I had to try to understand this very complicated question. In the beginning I only considered it as a nuissance, but later I understood that some of these activities were an intergrating part of the transfer to a new university system. Once this is realized I am quite sure that these political activities can and should be diminished to a level where they do not interfere with efficient teaching as they are doing now. The activities in question as I met them were of three kinds:

1) Foreign politics
2) National politics
3) University politics

Certainly 1) and 2) occupies more time of the students than in coun-

tries where the political systems are more stable than in Latin-America. However, what was completely new for me was point 3). Let me just as an example mention that the students are represented in most of the university boards and that they also in many cases have 33 % voting power. This means that in cases where some professors are ill or if some of them fear the students for some reasons the decisions will be made in favour of the interest of the students. In the meetings of the jury for selecting or suggesting five new professors there was always a student present. The students succeeded to get rid of one of the candidates to the new professorships even before his case was treated by our jury who was going to investigate the scientific and teaching merits of the candidates. The present rules that full time employed university professors are only selected for a few year period is said to be due to the pressure of the student associations, and this is indeed a very dangerous regulation. Everybody who has been working in science knows that it takes about five years to build up an efficiently working group. The possibility to leave everything just when things are starting to work is indeed not very attractive.

The real political power of the students on the university organization is relatively new as far as I can understand (only a few years). However, already in 1920 the Argentine students reacted against the old Latin university system and argued that teaching was also an affair between students and professors and not only between professors. The famous movement "La Reforma" was born. Gradually the students at least had some inside information of what happened but not until after the last revolution they got the power they have now. One of the most common arguments I met from the students was that they had to protect themselves from arbitrariness from the professors. In the beginning it was of course hard for me to understand this tremendous mistrust in the honesty of professors. But after having made my own experiences I just had to conclude that the students had the same troubles as myself. It was hard to find the so called professors and many of them just showed up to give a lecture a week and had their main job somewhere else. That this cathegory of people who had university teaching only as a biproduct would be able to have any deeper interest for the students is quite natural. I am positively sure that, when the Argentine university system has reached the point, where it is possible to speak

about staffs of departments there will be no justification for all this control and mistrust form the students, which for the moment is something which in many cases is rather serious. The most urgent point in Argentine university life to-day is to create such staffs, a question which should have the highest priority. It is encouraging that the students are critical and want something better but it is also a danger. Because of their youth they do of course not have the experience necessary in order to make decisions, which may be of deciding importance for the future of Argentine. One of the main justifications for having foreign specialists around in the Latin-American universities is just that they should help to realize staffs of professors devoting all their time to the universities and to help them to create respect from the students and from other people outside the universities.

6. Space problems.

The Faculty of Sciences of the Buenos Aires University is housed in a historically interesting building with the main entrance from the narrow street Perú two blocks from the famous Plaza Mayo. Not only is the narrow street Perú a nuissance making loading and unloading of cars and trucks and the going in and out of students and teachers a real problem. More serious was the fact that the Faculty was situated in the heart of all the political activities such as the frequent strikes and demonstrations. Many evenings I was not able to break through the chain of policemen or army people on my way home, but had to stay until midnight waiting for the streets to be cleared. During my first period the train strike made life a real problem for me and living in one of the suburbs I had to spend almost four hours a day going home in different mikrobusses. This was not any longer a problem after coming back from Bariloche when the Atomic Energy Commission kindly put a car and a driver at my full disposal and this driver was a specialist to break through police chains.

One of the most serious problems the Faculty has for the next two years is the space problems. Being orders om magnitudes too small and surrounded by business blocks it has no other way to expand than discovering before unknown corners. In a way it is of course a pity to see this historical building vandalized by adding boxes here and there on roofs and walls

giving an impression of a collective bird nest. But there is unfortunately no other way out of it.

When I arrived and saw the available space I did not believe my eyes. The physics department, if this word at all was justified, was at least 20 times too small making the coexistence of students and professors a problem of almost avoiding to step on each others toes. That such a physical closeness to neighbours creates irritation is needless to say.

During the short time I spent in Argentine I had the pleasure to see the area of the Physics Department increasing almost by a factor 3.

However, all these problems of fighting for space will only be an unpleasant memory in about two years when the Faculty will be moved out to the riverbanks of Rio de la Plata. When I left, the poling for the foundations were rather far advanced and they hoped to be able to move in within 2 years. The Physics and Mathematics Departments have highest priority.

7. The continuity question.

It is well-known that many times it is relatively easy to start projects in Latin-America. The difficulties come when trying to have something running over a longer period. Already at the time when I believed that I was going to work exclusively in Bariloche I came into contact with the continuity problem. I could not stay longer than for 10 months and Bariloche wanted a specialist for two years. I suggested than to Bariloche a three year contract covered by three different scientists from the same research group as the second best alternative. The first specialist would then be able to brief the other ones per correspondence and the later specialists would also have a chance to bring with them equipment according to the plans made by the first specialist. Later I had the wonderful experience to see how this worked in practice in the case of Dr. Gerholm and myself. Because of his pioneer work and his extensive and continous information I could start right away from the first day I arrived. Now, afterwards, I am even willing to consider this arrangement much more efficient than a longer stay of a single specialist. At a very early stage I discussed in Stockholm these plans with the UNESCO representative Mr. Vinden, who was very much enthusiastic about this suggestion.

At a very early stage in Buenos Aires I was asked by the dean of the

science faculty to make up plans for specialists in experimental physics covering a longer period. As I already emphasized in my correspondence with the UNESCO, during this building up period the main policy should not only be "to give Argentine the widest international experience in certain research fields". It is a question of getting people who are willing to help the Argentines to build up a new type on university and one has to take those ones who are willing to do this kind of work. In this stage it may even be dangerous with a sequence of specialists with different approaches. In addition it is very difficult to get highly qualified scientists who are able to leave with a short notice. I contacted physicists from about ten different nationalities other than Swedish and did not get a single positive answer. These are the main reasons for the sequence of Swedes at the Buenos Aires University. My Swedish colleagues were able to accept an prompt offer because they know Dr. Gerholm's and my own work due to our intimate contact with these people. I am aware of my responsibility in this question, but it is better to try and fail than not to try at all and in about two years it will be possible to judge if this approach has paid, though already now it looks very promising. For the sake of completeness I present below a list of the Swedish experts who have worked in connection with this project or who are going to do it.

1) Dr. Tor Ragnar Gerholm, University of Uppsala.
   Speciality: Nuclear physics.
   Main work at: C.N.E.A. and the Physics Department, University of La Plata.
   Mission period: October 22, 1957 - May 21, 1958.

2) Ingmar Bergström: Royal Institute of Technology, Stockholm.
   Speciality: Nuclear physics.
   Main work at: The Physics Departments of the Buenos Aires and La Plata universities and the Institute of Physics in Bariloche.
   Mission period: October 5, 1958 - July 3, 1959.

3) Gunnar Erlandsson, University of Stockholm
   Speciality: Mikrowave physics.
   Main work at: The Physics Department of the Buenos Aires University.
   Mission period: May - November 1959.

4) Torsten Lindquist, University of Uppsala.
Speciality: Nuclear physics.
Main work at: The Physics Department of the Buenos Aires University.
Mission time: November 1959 - May 1960.

5) Åke Nilsson, University of Uppsala.
Speciality: X-ray and electron physics, nuclear magnetic resonance, laboratory organization and planning.
Main work at: The Physics Department of the Buenos Aires University.
Mission period: Not fixed yet, probably May 1960 - May 1961.

As far as can be foreseen now, this list of specialists covers the critical period before the physics department has moved into their new buildings.

8. Other difficulties and problems.

In the Argentine temperament there are many pleasant features which I never will forget as a human being. As a physicist, however, I had lots of problems with a feature which was a source of much confusion. Time schedules are not relevant. Not only were the students delayed by hours but many times we had to wait for prominentprofessors. Some of this is intimately associated with the crowded communication means of Buenos Aires but lots of it is just no appreciation of the necessity to follow schedules and plans in general. This is also seen in long time planning or in the absence of long time planning. My students helped me very much in trying to change this attitude of people, just by putting themselves on a normal time schedule, in addition to their night work.

A striking serious problem in building up a new Faculty of Science is the shortage of good skilled workers and technicians and the appreciation by the academically trained people that a good modern science department to a great extent rests on the availibility and presence of this cathegory of people. This is of course a typical Latin-American problem like many I have discussed so far. It is striking that many of the best people of this cathegory are not Argentines but refugees from the Baltic states or similar countries. In order to meet a new industrialized and technical time much work has also to be put into the education of workers and to teach other

people to appreciate skilled manual work. Partly this problem goes back to elementary education in Argentine where children are usually not tought to use their hands. There was a so called entrance "workshop course" in the physics department when I arrived. The students started by cutting a piece of wood with a saw and continued making more "advanced" work. The work they did (and according to many teachers they had not done this before) is the kind of work one can see all boys at the age of ten or so do as a routine play in northern Europe.

I hope that the Argentine Government will realize that not only have the universities to be improved but the whole school system.

There are many other problems I had to try to understand, but which perhaps should be peripheric from my point of view but burning from the Argentine point of view. All these efforts in rizing the level of academical training should be an integrated part of the industrialization and finally after some time show up results which should be an essential part of the economical stabilization. It is an amazing paradox to experience how little the Argentine industry seems to be interested in the present events at the university. Furthermore, academically trained people with scientific background are used very little by the Argentine industry. This is partly due to the fact that many industries are foreign daughter companies and the "foreigners" have a tendency to put their own people in responsible positions or to do all the research at home. Many times it is claimed with justification that no competent Argentine people are available. To some extent this problem is also associated with tradition, a tradition which will be hard to break, even when good Argentine specialist will become available.

Another problem of inefficiency which costs Argentine lots of money is the absence of entrance examinations (exception Bariloche). It is especially emphasized by the student organizations that entrance examinations, where the number of students accepted is adjusted to the academical facilities, violate basic principles of democrazy. Partly due to this the Argentine universities have an abnormally low transmission factor. Only a few years ago less than 10 % of the physics students obtained their degrees. To a great extent the first years were used to sort out all the impossible cases. The most drastic example is the medical school where the

number of first year students was supposed to be larger than in the U.S. and where perhaps the transmission coefficient is only of the order of a few per cent.

B. Encouraging features.

Summary of my activities and extraordinarily good cooperation of counterparts.

Below I will try to summarize my activities during my relatively short time in Argentine. The reader of this report may get an impression that I am going to overemphasize my own work and the future value of it. However, I would like to point out strongly that the unexpectedly high output of my stay in Argentine to the greatest extent is due to the immediate respons and understanding of my counterparts. What I saw happening in Argentine during the short time of less than nine months has convinced me for ever that nothing is impossible in Argentine and Latin-America, and I am sure that this part of the world is going to change very rapidly. In order to illustrate the extraordinarily good cooperation with my counterparts I will present below something like a time schedule for my work and simultaneously try to illustrate how suggestions were followed by immediate counteractions in practically all cases.

October 16, 1958: Arriving to Buenos Aires.

End of October: After having seen the physics department in Buenos Aires, La Plata, the laboratories of the C.N.E.A. and the Institute of Physics in Bariloche I was aware of the problem of coinciding projects and asked the dean of the faculty of sciences in Buenos Aires if there was any kind of coordination in Argentine research in physics. The answer was no and I suggest a round table conference for these problems.

November 13 and 14: The Consejo Nacional de Investigaciones Cientificas y Tecnicas calls for a round table conference in Buenos Aires with participants from all the Argentine universities with the aim to discuss the coordination of future and present research in physics. Committees in different fields in physics were elected and supposed to give reports about the situation in their country in their own field. I should not overemphasize the future importance of this meeting but according to my own judgement it did clean up the air. Reports of this meeting have been

sent to the Headquarters previously.

Beginning of November: The planning of the radiofrequency physics group starts. The only nucleus for future research work in the physics department when I arrived was a project in mikrowave physics guided by a senior physicist, Dr. Jose Westerkamp, having only one student. I knew this work from my briefing in Paris where I saw that the physics department had asked UNESCO for aid. In addition there was a request for nuclear magnetic resonance equipment. Being asked for as a nuclear physicist I found myself soon in the peculiar situation of fighting day and night for a field of physics where I did not have any experience before. I did this because I felt absolutely convinced that group work had to be introduced as soon as possible in the department for "moral" reasons, and it is natural that I tried to push something the physics department itself officially had asked for. I admit now that before I decided this was a critical time when I considered leaving, but after some extensive discussions with the dean we decided to shoot very high or not to shoot at all. I am glad that I stayed in spite of the fact that I was going to meet the hardest working period in my life.

End of November: I ask the dean for 3 rooms each of 25 m^2 for the future radiofrequency group. He took me down in the basement and showed me some empty space and asked me if it was suitable and when it should be ready. I told him that three weeks would be a proper time, because we also had to convince the doubting people that something could be done quickly even at the Faculty of Sciences in Buenos Aires. I admit that I never believed that the laboratory would be finished in the short time asked for. It was finished in exactly two weeks.

Beginning of December: I suggest that one of the members of the staff Dr. Kowaleski be sent to Uppsala in order to be trained in nuclear magnetic resonance physics. He leaves for Sweden in the beginning of January 1959.

Beginning of December: The UNESCO-specialist Jim Daniels from Vancouver arrives and starts making a proposal for a more detailed programme in nuclear magnetic resonance physics. In March 1959 the physics department obtains US dollars 60000 for the purchase of equipment. I suggest that another member of the staff Dr. Farach joins Dr. Daniels and work with him for a year in Canada. Dr. Farach obtains a schoolarship from the

"Consejo" and leaves for Canada in February 1959.

Beginning of December: I suggest that Dr. Westerkamp should postpone his planned trip to the Columbia University where he was supposed to work for a year in mikrowave physics and that a foreign specialist is asked for so that he can take over the responsibility during the year Westerkamp is away. Westerkamp stays until the end of January when it is definite that Dr. Gunnar Erlandsson from the University of Stockholm will arrive to Buenos Aires for half a year as a UNESCO specialist on a funds in trust programme. Dr. Erlandsson arrives in May 1959.

Beginning of December: The physics department has a terrible lack of experimentalists, especially those ones with training in electronics. Already now I am aware of the poor multijobsystem. I convince one of the students who just got his degree in Bariloche to work full time for the physics department. After three days he agrees and also the C.N.E.A. agrees which was very important for me, because the student was also employed there. The student becomes the personal assistent of Dr. Daniels and starts a project in nuclear quadrupole resonance physics. He built all the equipment himself and this was about completed when I left in June.

Middle of December: At this time the radiofrequency physics group has only three students and at least ten would be needed. I suggest to the dean of the faculty and to the head of the Institute of Physics in Bariloche to change my elementary course in nuclear physics in Bariloche to a summer school with participants from the whole country. The Bariloche Institute agrees to pay the expenses in Bariloche and the university pays the travelling expenses for students from Buenos Aires. The interest is at first not very great among the students and I am forced to take part in the social life of the students in order to secure the recruitment. I will never forget the turning point after which we had to send a cable to Bariloche almost each day announcing the arrival of new students. Since the Latin-American cosmic ray symposium (sponsored by UNESCO) coincided with the summer school during two weeks in Bariloche it is evident that Bariloche did have problems. The total number of participants in the summer school was finally 35 of which 12 came from the Buenos Aires university, 3 from La Plata, 2 from San Luis, 2 from the C.N.E.A. and the rest from the Bariloche school.

There was not sufficient equipment in Bariloche for such a summer school. I had to walk around in the Buenos Aires region and "confiscate" sufficient amount of instruments and finally we unloaded more than two tons of equipment from the Buenos Aires train in Bariloche. The summer school started on January 7 and lasted until March 7, 1959. More about the summer school in another section of this report.

End of January: The students work so well that I write an enthusiastic report to the dean of the faculty in Buenos Aires, which was successfully used in order to push many projects in Buenos Aires. Among other tings I am asking for two small rooms for research in nuclear physics. I knew that there were no rooms at all available. There is no answer from Buenos Aires because the dean of the faculty is working hard in order to avoid strikes at the university, because of the 29 article which is just going to be passed in the congress. This article legalizes private universities and many people fear that so called conservative catholics are going to dominate the academical life. Being a foreigner I cannot of course take any side in this matter. I only try to convince the students how meaningless a tool strikes in general are and that hard work is always a better answer whatever their opinion in this matter is. I also tell them how meaningless it is for Argentine to make long time educational planning and invite foreign expensive specialists, when their work may be paralyzed by students in strike. The strike is avoided and when we returned to Buenos Aires 5 rooms were waiting for the new group in nuclear physics born in Bariloche. During the same period a new training laboratory for the students and a seminary room were completed; altogether the new space was about 200 m^2, which may not seem very much, but which for the physics department is going to be very important. Because of the fact that there are now students working and space available for nuclear physics about 700 000 pesos were given the nuclear physics group for the purchase of equipment for a modern training laboratory in nuclear physics. Recent reports from Buenos Aires have informed me that this work, which is guided by lic. Peyre from the C.N.E.A. is going very fine.

Middle of March: Back again in Buenos Aires. Negotiations with the C.N.E.A. and the university of La Plata about the fulfillment of the projects which were started by Dr. Gerholm. Now Argentine has only one official currency.

Only after a few weeks these problems were straightened up and money deposited in Sweden according to the contract for instruments to be built there by Argentine students. In August the first one of these students arrives to the physics department in Uppsala.

Middle of March: Already in Bariloche I started some research work with with some of the students. I planned to finish this in Buenos Aires for many reasons, the most important one being that I wanted to prove that things could be done even with very little equipment and by relatively unexperienced people. In order to realize this I suggested to the head of the Institute of Physics in Bariloche to borrow as my assistent one of his students in the last year and some equipment, to which suggestion he immediately agreed. Before I left Buenos Aires this little group in nuclear physics finished their investigation in a very satisfying way and the work is going to be published in a short time.

Middle of April: The mikrowave group obtains about 1500 US dollars for bying equipment, which does even arrive before Dr. Erlandsson comes.

Beginning of May: I suggest five new positions for the technical part of the staff, mainly electronics and fine mechanics. This is immediately agreed to, but difficulties arise when employing this cathegory of people partly because of the lack of skilled people of this kind in Argentine and partly also because people are suspicious about the possibility of a permanent job in the faculty of science.

May and June: I belong to a jury supposed to make suggestion for five new professors in physics. The jury agrees to suggest with preference those candidates who can devote themselves full time to the physics department. Again I hit some unsettled questions between the faculty and the C.N.E.A. and suggest to the faculty of sciences that they immediately takes up negotiations with the C.N.E.A. to straighten up these problems. This was done only two days after my suggestion.

Middle of September: Arrives to Sweden lic. Pedro Thieberger from Bariloche. I am responsible for the experimental part of a Ph.d. work in nuclear physics for Mr. Thieberger and another student lic. Bonacalza, who is expected to arrive in September 1960. In addition I hope it will be possible to arrange from Swedish funds schoolarships for a few more of the best students in the summer school.

2. The educational programme.

In spite of her enormous economical difficulties, Argentine now has an educational programme for physicists, which is rather outstanding in Latin-America. Especially interesting is the expected rapid increase of graduated students, which will be realized in a few years if the university situation will continue stabilizing. The table below is perhaps somewhat approximative but I think it mainly reflects the prognose.

Year	1959					1961
Year of studies	1	2	3	4	5	5
University of Buenos Aires	120	80	50	10	10	35
The Bariloche school	0	0	19	15	13	18
University of La Plata	20	?	?	?	5	5-10
					28	60

The table refers to the situation at the beginning of June, 1959. Looking at the first row one might believe that this reflects the low transmission factor discussed before. To some extent this is also the case, but it must also be remembered that the sudden change between the number of students in the third and fourth year in a very intimate way is associated with the time of the revolution. I predict that of the fifty students now in the third year, about 35, will have their degrees in two years because of the sincere efforts of the people in the physics departments to make teaching more efficient. This will mean that in 1961 Argentine for the first time will graduate about sixty physicists. The corrsponding figure for Sweden (three times less population) is larger than 200. In no other Latin-American country there will be such a drastic change in such a short time.

Going back to the table above it is evident that the Faculty in Buenos Aires is going to have real problems the next three years, because of the sudden increase of the number of students. It is needless to say that during this period the help from UNESCO in the form of specialists and equipment is of a very great value. What makes me optimistic about the future of the physics department is the fact that the faculty is giving the building up of the physics department a very high priority and

that many non-physicists in the faculty are aware of the fact that the whole faculty of science would profit from a good physics department. The students especially and also several teachers are working with enthusiasm in order to be able to meet the difficulties.

3. The extensive exchange and fellowship programme.

In a special report to UNESCO I presented a table of the Argentine fellowship - programme in physics and related fields. I came to the surprising answer that about one year ago there were (or were just leaving) about forty Argentine Physicists studying abroad. This very great number is also associated with the revolution. It may seem very encouraging, and it is, but it also involves some very great dangers in Argentine science. First of all most of these people would be needed for the building up period at home. I also noticed that many of the schoolars used the fellowship as a possibility to reach other countries where the salaries and facilities for the moment are better than in Argentine. Many schcolars also choose the subject and the place where they are going to work rather randomly. This means that the schoolars in many cases are going to stay abroad for ever and in the cases where they do go back they will often not find any corresponding activities going on. The Argentine National Research Council, who now is responsible for the main part of the fellowship programme, is aware of this danger and have sharpened the fellowship requirements considerably. As far as I can understand they are giving priority to cases which fit into the future Argentine programmes of research. Thus there is now a sound tendency of sending students from already existing groups or groups just being established.

In this connection I must mention the great importance of the initiative taken by the UNESCO-expert Dr. Tor Ragnar Gerholm. He has for the moment three students from Argentine working with him in Uppsala and he is waiting for a fourth one to arrive. Two of these students are building instruments which they will bring back home to Argentine. Dr. Gerholm's experience of the work of these students is very encouraging and in this way there is of course a 100 % guarantee that the students will return back and contribute to the work of the groups waiting for them in Argentine. It is of course of a very great importance that these students are

guided by somebody having been in Argentine and knowing her problems. It should also be mentioned that a girl from the Physics Department in Buenos Aires is just returning from England where she has studied for two years with Dr. Devons, the first UNESCO specialist in physics in Argentine.

As I have mentioned before my first job in Buenos Aires was to try to start a radio frequency group in Buenos Aires. This is not at all my field and I could only bring it to the stage when a real specialist had to take over. The appearence of the UNESCO-expert Daniels from the University of Vancouver came in the right moment. One of the many problems which had to be solved was the education of faculty people for this job. It was decided very quickly to send lic. Farach to Vancouver for a year and Dr. Kowaleski to Uppsala. Lic. Farach did not have very much experience when he left, but according to reports from Vancouver this experiment has been successful. Dr. Kowaleski on the other hand was no doubt one of the best experimentalists I met in Argentine, who, however, had not concentrated in a certain field of physics. He was sent to Uppsala for two reasons. Firstly I knew that this place had the right scientific climate for a case like this. Secondly in Uppsala was working Dr. Gerholm with lots of Argentine experience. In addition Kowaleski would there also have a chance to know Dr. Åke Nilsson, who was scheduled to work on a UNESCO-contract at the physics department in Buenos Aires.

The Uppsala-people are very much satisfied with the work of Dr. Kowaleski and his wife.

Dr. Daniels also visited Bariloche. It was agreed that from September 1960 Daniels would work for one year in Bariloche. In order to save time it was suggested that two Bariloche students (lic. J. Cotignola and lic. M.E. Porta) who graduated this year would work with him in Vancouver and there construct low temperature equipment and other research tools. In this way Daniels would not only have equipment but also trained students so that he could start his activities right away on his returning to Argentine. Later it was decided that a third student (lic. O. Vilches) would also work in Vancouver for a year. In the first two cases the students were paid by the International Atomic Energy Agency in Wienna. In the last case it was agreed that the salary was to be paid by the university of Vancouver and the travelling expences by Argentine fonds.

In Bariloche I was given the responsibility for suggesting plans for the training laboratory in nuclear physics and for nuclear research. I also got the responsibility for the experimental part of the doctors degree of two very bright students. We already succeeded to do some research in Bariloche and it was agreed that these two students if possible would join me in Sweden. The first one lic. Pedro Thieberger arrived in our laboratory on Sept. 15 ago paid by the Argentine National Research Council. In one year the second one lic. Enrique Bonacalza is expected. At about January 1, 1960 I also expect Dr. Sametband from the Argentine Atomic Energy Commission. Sametband has the responsibility of the magnetic isotope separator in Buenos Aires and wishes to study the special technique of lowintensity - high efficiency isotope separation which has been developed in the Scandinavian countries. His coming is somewhat depending on the present economical crisis of C.N.E.A. There are at least four other outstanding students from La Plata and Buenos Aires who should be trained abroad. I am together with Dr. Gerholm investigating the possibilities of Swedish schoolarships.

One of the difficulties in my field in Argentine only two years ago was that the number of people with a degree in nuclear physics was very small. The extensive fellowship programme discussed above will very rapidly change this, which certainly will mean a more efficient use of their facilities. It will also mean a more sound balance of nuclear research and many of the problems which now are burning in Argentine will disappear.

I hope that the information given above will convince UNESCO that their specialist efforts in Argentine not only were worth while but are still worth while. The fact that the specialists have agreed to educate Argentine students in their respective laboratories means of course a prolongation of the efficient time of the specialists which is perhaps not immediately apparent.

4. The spirit of the students.

There were many reasons in the physics department to give young students a much greater responsibility than they had so far, the main one being of course the lack of people. Because of these requirements I changed

my Bariloche activities to a summer school, where I would get a chance to check especially the Buenos Aires students. The students were put on an extraordinarily hard time schedule. We started at 08.30 and had seminar activities until 11.00. Then followed laboratory work which in most cases lasted until midnight. It is quite evident that I could not give all the seminars myself. Each participant in the summer school was responsible for a seminar in such a way that we covered a large region of nuclear physics. In the laboratory each student made 8 different whole day experiments which were superwised by two other students. They were simply given a certain equipment and asked to construct a certain experiment after some very rough instructions from me. It was very stimulating to see how the students used their energy and latent capacity. Two of the Bariloche students were even able to extend one of the routine experiments to a little piece of research work.

Many people objected that in Bariloche it was of course possible to do something but would the students work as well when they came back to routine work in Buenos Aires? It was a great pleasure for me to see that even cases which were almost before considered to be impossible changed very much and I believe that the students themselves showed many doubting people that things are not at all impossible if the students are given responsibility and a chance to work. Comparing these students with my experiences in the US and in my own country I arrive at the conclusion that they are as good if not better. I doubt whether I will be able to have any more such an inspiring work as I had with the Argentine students. I think that the Argentine Government should be made aware of this very promising human material. In order to use this good material efficiently, however, many things have to be improved at the Argentine Universities some of which I have discussed i IIA.

III: Experiences of other Latin-American countries.

1. Chile.

In Chile there is no specialization of physicists at all. At the engeneering school in Santiago there is a 1 Mev Cockroft-Walton machine which was bought from Philips in Holland. This group is guided by a Dutch physicist, van Loef, who together with a few coworkers is working

on neutron physics problems. Unfortunately van Loef was on vacation in Holland when I visited Santiago on my way back to Buenos Aires from the summer school in Bariloche. I was told by a few Dutchmen I met in Sweden this summer that van Loefs experiences with the Chilean students are very much alike my own in Argentine. If they are taken care of they show up a working capacity and an interest which promises much. Some Chilean students get their training in Bariloche, which by the way is closer to Santiago than to Buenos Aires. One of them Mr. Lopez-Silva impressed me very much and I think he will go very far.

2. Brazil.

I was invited by the Brazilian National Research Council to spend one month in Brazil. The Council paid the living cost for me and my family during this time. I spent three weeks at the Centro Brazileiro de Pesquisas Fisicas in Rio de Janeiro and one week in Sao Paulo. One month is of course a very short time and for this reason my impressions in this case may be still more diffuse than in Argentine. However, I am confused about the contraversary problems I met.

I asked one of my Brazilian colleagues to summarize the physics situation in Brazil and he did this in a very concentrated way: "The money is in Belo Horizonte, the instruments in Sao Paulo and the physicists in Rio". Even if this is an oversimplification I think that this man hit some of the most burning problems in the field of physics in Brazil.

Before going into details about the different institutes I should perhaps say a few words about the educational problems, because these seem so different from those in Argentine. No foreigner can avoid being extremely impressed by the tremendous industrial boom in the Sao Paulo district. The experimental facilities in nuclear physics is perhaps even better than in Argentine. Having this in mind it is almost unbelievable that in Brazil less than 10 physicists get their first academical degree per year. Even more serious is that I could not see any sign of rapid change. Already next year the Brazilian Government is going to ask for an offer for a 150000 KW power reactor to be placed between Rio and Sao Paulo. Belo Horizonte has recently ordered a new research reactor from the US. There is already a beautiful swimming pool reactor working in Sao Paulo in addition to a very

good van de Graaff generator and a 20 Mev betatron. With these facilities Brazil ought to be able to have an output of physicists which is at least ten times more than for the present. Many people claimed that there was no understanding of the Brazilian Government to give the young people positions after the end of their studies and that there was even less understanding from people in the Brazilian industry to use physicists in the production. This is, maybe, also true but I also noticed that very few scientists seemed to have the courage to try to make a change. There were people who were proud of the fact that they were able to make research without any duties towards the universities.

It is often claimed thatmany of the problems now existing in the Latin-American universities can be directly derived back to the historical influence of the catholic church, which for obvious reasons in the past put the emphasis on other subjects than experimental sciences. I think it is significant for the situation in Brazil that the catholic university in Rio in a way is now trying to do the same pioneer work in experimental sciences as is done at the faculty of sciences in Buenos Aires. In a meeting of the Brazilian Academy of Science, where I gave a talk I was introduced to five foreign guest scientists, all working at the catholic university. Among them was a German UNESCO specialist in measurements of fall out products. He had the same experiences in Brazil as I had in Argentine. The students were working wonderfully if they were taken care of, but he was also worried about the relatively small efforts made in order to get science and research directly associated with university teaching also from the geographical point of view. I also met Prof. Buchner from MIT in Cambridge, USA, who was invited by the catholic university in order to investigate the possibility of having there a four Mev van de Graaff generator.

Much of the teaching at the physics department of the Rio university is taken care of by scientists employed at the "Centro". In a way the problems in Rio and Buenos Aires are or were similar. In Buenos Aires many teachers came from the C.N.E.A. This has the evident draw back that a real staff at the Physics Departments is missing. In Buenos Aires they are trying to change this by employing a larger amount of full time professors, admittedly with difficulties, but I am not aware of similar efforts in Rio,

though I sincerely hope they will come.

The physics department of the Sao Paulo University.

Modern physics in Brazil was born in Sao Paulo, where in 1934 thanks to Armando Soller de Oliviera, who succeeded to push through his idea of inviting several foreign physicists especially Italians. Most of these people are now back in Europe again but they left a new generation of young Brazilian physicists.

The Faculty of Sciences of the Sao Paulo university has also many similarities with that one in Buenos Aires. It is housed in the more central parts of the town with few possibilities to expand. It was as far as I could judge just a place for blackboard teaching and administration. When I gave a seminar there we could not even find a projector available. Like in Buenos Aires the department of Natural Sciences is going to be completely moved out to a new wonderful campus outside the town though this project is by far more advanced in Sao Paulo. Thus all the research facilities in nuclear physics are already on the new campus in addition to the training laboratories in physics. I was extremely impressed by the research facilities concentrated on the new campus. With this wonderful equipment the physics department of the Sao Paulo University should be one of the very best ones in the world. In sharp contrast to these possibilities are the small number of students and people employed in research. The lack of coordination between the main laboratories having the reactor, the van de Graaff generator the betatron and the ultracentrifuges was also so apparent that it even has to be discovered by temporary visitors like myself. With coordination, with a much more emphasize on educational problems and with understanding from the Brazilian industry the physics department of the Sao Paulo university ought to have a great future.

Instituto Technologico Aeronaautico.

From what I have said above it is evident that Brazil has to emphasize and consider the teaching problems much more than has been the case before. Like many of the Latin-American countries Brazil does, however, have a teaching institute of international standard working independently of the university system; the CTA = Centro Technologico de Aeronautica. This

institute is so outstanding that it to be mentioned though the emphasis is not on physics.

Before 1950 education in the field of electronics and aeronautics was completely missing at the Brazilian engeneering schools. The Brazilian air force employed the dean of the college of engeneering at MIT in USA in order to investigate the possibility of introducing education in aeronautics in the air force school. Smith soon discovered that he had to start from the beginning because of the absence of efficient teaching in already existing engeneering schools. Thus this project which from the beginning was purely a military one soon developed to a semicivil institute. The project was thus divided in two parts:

1) ITA more or less an engeneering school of civil character.
2) IPA a research institute mainly working with material testing problems especially those ones of military interest.

The organization of the school is clear from below:

year	type of training	subject	attendence
1-2	fundamental		
3-5	specialization	Electronics	50 %
		Aeronautics	50 %
		(Mechanical engeneering	planned)

About 100 students per year are accepted out of about 1200 applicants. The students are on a full schoolarship covering all their expenses.

The Institute is situated in a flat region about two hours drive in the direction to Rio. The most striking feature of the Institute are the enormous distances. The necessity of separating the school from the restaurant, the laboratories and the housing aerea almost by miles gives the impression of a play by architects. Significant was that the school supplied the students with bicycles without which they would loose much time when moving from one place to another inside the institute. The teaching facilities, however, were outstanding and the methods very much modern. It is also an acknowledged fact by foreigners having their activities in Brazil that these students are very much useful. I must admit that I returned from my visit to this institute full of enthusiasm but also very much confused

because of the sharp contrast with the situation at the universities. It should perhaps be added that the budget of the school indirectly can be derived back to the budget of Brazilian air force and that the president of the institute is Prof. Steinberg from Maryland, USA.

Centro Brasileiro de Pesquisas Fisicas.

One of the great problems in Rio is the expensive lots in the more central parts of the town. Also the "Centro" is suffering from this, squeezed in as it is, between some university buildings at the Avenida Wencesclau. There was a fire a few weeks before I came destroying almost completely the best physics library in Latin-America and making a considerable damage to the rest of the building. At the very evening I arrived there was a ceremony at the "Centro" in order to celebrate a Government decision to make a new 5 floor building, which would take about 2 years. The budget of the "Centro" was also increased from 30 million to 50 million cruzeiros, certainly a considerable amount of money.

One of the more internationally known scientists in the Centro is Cesar Lattes, who belonged to the teams in England and USA who observed the π-meson for the first time in cosmic rays and artificially produced. This meant of course a considerable goodwill for Brazilian science and Cesar Lattes obtained lots of responsibility when returning to Brazil. The first idea was to build up experimental physics around a big synchrocyclotron to be situated at the peninsula Nitteroi opposite Rio. The building up of this laboratory at Nitteroi was in fact started. Well equipped workshops and buildings were made and even a model of the synchrocyclotron. But later the projects was dropped for reasons I do not know about. Some people claimed that it was to far from Rio and that the climate was even worse, but there must be deeper reasons. Left remains in Rio an extraordinarily well equipped workshop, which, however, does not reflect the present experimental activities.

The activities in the Centro is divided in about five sections with the following distribution of full professors and students.

1) Nuclear emulsion group 1: Cesar Lattes + 5 assistents and students + 10 scanners.
2) Nuclear emulsion group 2: Hervacio de Carvalho + 2 assistents and students + 10 scanners.

3) Nuclear Chemistry and pulseheight nuclear spectroscopy: Luis Marquel + 4 assistents and students.
4) Theoretical Physics: Gideo Beck (pioneer in theoretical physics), Leite Lopez + another 3 full professors + 2 associate professors + 12 assistens and students.
5) Mathematics: 3 full professors + about five assistents.

This Institute ought to be very active and it is. In addition it has the advantage of having experimentalists and theoreticians working in the same place. Being an experimental physicists I am perhaps missing more experimental activities. The nuclear emulsion physics does not give the students sufficient experimental training and has a tendency all over the world to be more and more theoretical. And Brazil needs much more people with experimental background in order to be able to stand the pressure of tremendous industrial development.

3. Venuzuela.

Physics in Venuzuela is very new. I think it is just starting but it is starting up very quickly and in a very encouraging way. I am happy that I did not skip a visit to this country which I first planned. What a few people have been able to do in a short time is really admirable. Venuzuela has of course the advantage of having a good economy but it is always an art to use this money in a creative way.

The Physics Department of the Caracas university.

As is well-known there are few universities in the world which from the architectional point of view can compete with the University of Caracas and Mexico. The head of the mathematics and physics departments is Prof. Bemporad from La Plata in Argentine, where he worked with the famous (in Argentine) Richard Gans. Bemporad had to start absolutely from scratch and now they have for the first time six students in the first year studying for a degree in physics. Already next year 20-30 students are expected mainly through the propaganda of the students themselves. As far as I could understand there was really no propaganda needed; the students were indeed happy and there are really not very many places in Latin-America where they

are.

It is quite natural that it is not possible to build up a good physics department in such a short time without importanting foreigners which is illustrated from the staff list below.

Ghiglione from Buenos Aires working with analogy methods and calculating machines.

Gintel from Poland and Sweden; speciality ferrodielectrics.

Bourgeal and Velayos from Spain working with the magnetic properties of thin foils. Resistance measurements of thin foils (200 Å). The work related to memory of computers.

In addition there were several foreign technicians.

The laboratories and teaching facilities were modern and of first class. It was especially encouraging to see how the experimental teaching was emphasized because this is mostly missing or very poor in many Latin-American countries.

There were no plans to start any research in nuclear physics. This is going to be centralized in the institute called IVIC, again a research institute broken out from the university organization. However, in Venuzuela this does not any longer seems to be a serious problem as it was only two years ago. As far as I could see there was a very fine and efficient cooperation between the head of the physics department and the director of IVIC.

IVIC (Instituto Venezolano de Investigaciones Cientificas).

This institute was initiated by Dr. Fernandez Moran who had the idea to create in Venezuela an institute for neurophysiology which is also reflected in its first name: "El Instituto Venezolano de Neurologia e Investigaciones Cerebrales". The change of the name is much more significant than might immediately be understood. Like the famous Richter in the Argentine Moran was intimately associated with the dictator of his country. In the last part of this report I am coming back to this problem. Let me just now state that IVIC now seems to be in good hands and I was extremely impressed of what I saw on these beautiful hills 15 kms from and almost 1000 meters above Caracas. I lived in IVIC for almost a week and had a good opportunity to talk to many of the scientists and technicians. The research activities are divided in the following main fields:

1) Physiology
2) Biology
3) Medicine
4) Chemistry
5) Physics

The first three sections are already working and in few places I have seen such extraordinarily good equipment and even satisfied people. Many of the staff scientistsas well as technicians are from abroad. When the revolution came there were 200 people on the hill but no scientist. The present chief Dr. Roche has succeeded in calling back almost all the foreigners and even got new ones. Even if very high salaries (professor salary 1300 - 1500 US dollars a month, tax a few per cent) are offered this is indeed remarkable. What makes me optimistic about the future of physics in Venezuela is the fact that the chiefs both in IVIC and the physics departments both are Latin-Americans and that they are able to cowork.

The chemistry and physics departments of IVIC will mainly be concentrated around the swimmingpool reactor, which is becoming critical in the beginning of 1960. In addition to radiochemistry, nuclear spectroscopy and neutron physics emphasize will also be put on solid state physics. They already now have equipment for nuclear resonance and low temperature physics. In other words in physics and chemistry they have in IVIC almost everything even a good spirit and atmosphere but people are missing and quite definitely they have to import people and here comes Argentine into the picture.

I had the most wonderful experiences of mixing of all kinds of scientists in a place like this. So for example I listened to a lecture by Dr. Roche about an expedition to the inner parts of Venezuela in which some members of the institute took part. It was a question of field investigations on indians who never had been in contact with the white civilization. Things like measurements of scull dimensions, lung X-ray photography, response of the thyroid to I^{131}, were made.

Considering that the revolution took place in January 1958 I think that the two places discussed above have made an impressing progress and if the future development continues like this it will not take many years

before Venezuelan science is of international class. The only problem in Venezuela which at the same time is their strength is the great number of foreigners. However, these seem to be willing to stay and are in general very interested to create a new generation of Venezuelan scientists.

4. Mexico.

The Physics Department of the Mexico University is situated in a little skyscraper on the famous university campus with the accelerator laboratory very close to it. Many of the problems which are very difficult ones in other Latin-American countries do not seem to be so serious here. This is certainly due to the facilities offered in the new campus. If any problems are to be mentioned they are associated with the great number of students in the first years and the low transmission factor depending on the absence of strict entrance requirements. The distribution of students show up the same interesting features as in Buenos Aires.

	B.A.	Mexico
1)	120	150
2)	75	75
3)	50	37
4)	12	18
5)	10	-

As can be seen from this table the two departments of physics in Buenos Aires and Mexico have about the same number of students, though I think that the professors in Buenos Aires were happier with the quality than they were in Mexico. In addition physicists are now also eductaed in the northern part of the country in the town of Monterey where the number of students in the first and second years are 25 and 11 respectively.

Another problem which also exists in Caracas is associated with the space question. For the moment the available space is enough but there is put down such an enormous amount of architectional consideration in these two beautiful campuses that it will be extremely hard to expand without seriously violating the primary ideas of estetical balance etc. What does a physics department in the 5, 6 and 7 floor of a skyscraper do when it

wants to expand?

The research in nuclear physics and related fields is divided in three fields. One group is working with carbon dating problems and another one with fall out problems. The most internationally known experimental group is, however, the van de Graaff-generator group, which has benefitted very much of the intimate contact with the group guided by Prof. Buchner at MIT in USA. There is also a very active theoretical group guided by Dr. Moshinsky.

In addition to a 2 Mev van de Graaff generator there is also a smaller machine (0.5 Mev) of the same type intended for neutron cross section work. It will be used in connection with a subcritical reactor. The physics department also has serious plans of having a 12 Mev tandem generator.

Lots of very good measurements have been made with the 2 Mev generator mainly because of the very good analyzing magnets. As far as I can understand it is one of the best (if not the best) in the world. It is of the broad range type and has a resolution of 0.1%. For the moment the group is remeasuring all masses up to sulfur which is part of a program to be presented at the international mass conference in Canada next summer.

What impressed me most about this group was that they were not shooting towards too exclusive problems and in this way they kept there graduate students busy. Many times in Latin-America people are so ambitious in their plans that they never get started. Of all the physics departments I saw in Latin-America that one in Mexico seemed to be the most stabilized one.

IV. Latin-American problems summarized and compared.

Through my visits in other Latin-American countries I have got additional information, so that it might be possible to understand which problems in Argentine really are Latin-American and which ones are specific Argentine ones. I shall try below to take up a few points discussed in the introduction and show how they have been solved in some countries and what still is serious in other countries.

The breaking out of research and teaching from the universities.

There are for the moment two efficiently working schools in the technique and science in Latin-America. One is the Bariloche school in Argentine

and the other is El Instituto Aeronautico in Brazil. Both these places are now also starting up research. In order to make the Latin-American picture complete the IVIC-institute in Venuzuela should be added though it is not associated with elementary teaching. Significant is that all these institutes get their money from more safe fonds than the university organization, which no doubt is one of the reasons that these places work better than the universities. In the three different cases the economical sources are the Argentine Atomic Energy Commission, the Brasilian Air Force and the Ministerio de Sanidad.

Regarding the Richter-project in Bariloche (which has nothing to do with the present activities except the position) and the IVIC institute there are very many parallels. In both cases the projects were initiated by scientists who got their degrees abroad (Richter in Checoslovacia and Moran in Sweden) and who were intimately associated with the former dictators. They both chose very isolated places, involving lots of constructional costs. Richter chose the slopes of an island in the famous lake of Nahuel Huapi and Moran the slopes of a systems of hills outside Caracas. In both cases they surrounded themselves by gendarmes. In both cases orders of magnitudes too many copies of the same instrument was bought. In both cases there were no more scientists around when they had to leave but hundreds of people with very little background. They were both finally very impopular. Nevertheless it is a fact that their rather fantastic projects initiated activities in their countries that probably would not exist today without their peculiar ideas.

In Mexico I was not aware about the existence of teaching and research institutes competing with the universities and much of the experimental activities are indeed done at the university. In Venuzuela the problems are solved by a very good cooperation between the university and the IVIC- institute. In Rio, Sao Paulo and Buenos Aires the problems do still exist. I cannot say anything about the future of strengthing the position of the Brazilian universities from this point of view. Perhaps the moving out of all activities to the new university campus in Sao Paulo will change the situation very quickly. In Rio and Buenos Aires lots of work still remain to do in order to create respect for the university organization and especially in Buenos Aires people are working very hard in this respect in

spite of all the difficulties.

My general impression is that in all the Latin-American countries there still remains much to be done in order to gain respect by the Governments and individuals for the possibilities to have efficiently working universities. Why should otherwise a university exist at all? I look upon my Buenos Aires activities as an important phase in these lines. I admit that I see this much clearer now when Latin-America is somewhat distant. Any universities in Latin-America who asks for aid which can be realted to the above discussed very important question should be encouraged by the UNESCO.

The importance of space.

It was quite interesting to see how many of the problems in Buenos Aires, Sao Paulo and Rio did not at all exist in Caracas and Mexico because these universities had the advantage of a new very modern campus. This is of course not only due to the fact that abstract art and gay colours make you happy but especially to the fact that there was sufficient space available for a decent planning of teaching and research. This is one of the reasons that I have advised UNESCO to emphasis their activities to the Natural Science Department in Buenos Aires especially during the next two years preceeding the moving out to the new Rio de La Plata campus. These years are very critical an absolutely deciding for the future of Argentine science.

The so called Latin-American inefficiency.

Almost all people even the Latin-Americans themselves were very sceptical about the possibility to realize anything during my short stay and if anything was done it would fall into pieces immediately after I left. I have talked to many foreign specialists in different Latin-American countries and we all agree that the material is very good if it is treated in the right way. What mostly is hard is not to get individuals to work well but to have large projects running for a longer time. The bottle neck is the bureuacrazy and the lack of leaders. Much emphasis has to be put into the education of leaders who can treat things in a democratic way. It is also encouraging to see how in many places they even dare to try to get rid of the inefficiency of the horrible bureaucrazy. I decided to forget

that I was in Latin-America with the most amazing positive results, which was due to the reponse of people I met. In Buenos Aires the students were just hungry to get somebody taking care of them and they were willing to do anything regarding hard work and sacrificies.

In Sao Paulo I talked to the director of a foreign factory now making transformers. During the constructional period they did not have any skilled workers at all for future production. The foreman of the workers making the building seemed to be a reliable man and he was asked to select about thirty of the most reliable people. Most of these people could not even write but had to use fingerprints when obtaining their salaries. They were tought how to read and count and how to treat lathes and so on, after only a few years the production per capita of this factory is as high as in the European mother factory and the quality of the products is as good.

My definite impression of the Latin-American people is that there is nothing inherently impossible in the human material. It is a question to exploate this in the right way and this means lots of work and patience by the exploaters.

Entrance examinations and limitations.

In many of the Latin-American countries the students claim that entrance limitations is not in accordance with democracy. I think that lots of efforts should be made in order to give the students more information about these problems in other parts of the world. In natural sciences where the studies are depending on laboratory facilities there is no other way out of the dilemma than accepting a certain number of students per year which corresponds to the facilities of the university. There are several reasons that the students are justified to think according to their present lines. One is that previously experimental teaching really has not been very much experimental and then of course there does not arise any conflict between the number of students and the facilities available.

In Argentine the students claim that the main justification of not having entrance examinations is that in the way the Argentine universities have been organized before there were no competent people who could be responsible for fair entrance control. Because of the absence of departments the students were afraid that the famous "cuña"-problem might dominate also

the selection of students. It is interesting to see that at the physics departments of the Mexico university which does have a staff and is running reasonably well, there is still no entrance examinations.

Another reason is that very few students put their studies in connection to the need of the country and since the industries in the Latin-American countries so far has not been very much interested in having scientifically schooled people the studying of science has been something exclusive, which is done to satisfy only the interest of students. As soon as the interest of a country comes into the picture one has to put educational efficiency in the first lines and than there is no justification for unlimited acception of students. It may be possible to do this in countries like the US where the economy allows it, but in the Latin-American countries where the economical problems in most cases are very grave I do not see any future justification in this system. In all North-European countries, Russia included, there are very strict entrance selections adjusted to the teaching facilities.

In Bariloche and in The Instituto Aerinautico in Brazil where entrance selection is very strict the transmission factor of students is comparable to that one in northern Europe while at the university of Buenos Aires and perhaps still more in Mexico there is a very small fraction of the students finally getting their degrees.

Output of physicists, salaries and research facilities.

I have tried to summarize in a table some of the most predominant features of Latin-American Physics. I am aware of the fact that the table is incomplete and approximate but it contains some of the most interesting features of this field of science in Latin-America. I also think that it can be easily extrapolate to other fields.

Looking upon the problems from the Argentine point of view an obvious danger is immediately apparent. The high output of Argentine scientists compared to the other countries and the ridiculously low salaries certainly is going to mean a flux of people to Venuzuela where the need of people is high and the salaries are very good. It will probably take at least six years before Venezuela is producing sufficiently many people. In addition Venezuela has the advantage of having a university intimately cooperating

with the research institute IVIC. This calls for much higher salaries in Argentine and in addition to emphasis much more than has been done before the coordination and cooperation between the universities C.N.E.A. and the Bariloche Institute. Very important is especially to try to understand the best way of the future organization of all the academical activities which now is taken care of by C.N.E.A., one of the solutions being centralization in some kind of a national institute like IVIC in Venezuela.

I do not think there will be a flux of people from Argentine to Brazil, which might be suspected. This is not only due to slight language differences but for the moment in Brazil there is not a sound balance between research facilities and available positions. If Brazil continues producing this low number of physicists it very probably is going to face a very sudden unpleasant wake up at the time the rapidly growing Brazilian industry becomes aware of the necessity to use this kind of educated manpower in the production.

I spent too little time in Mexico in order to have a clear idea about the situation but also there the low salaries, the multijob system has to be considered because of the geographically short distance to the US, where considerably better facilities are offered even for very young people.

Acknowledgements.

My mission was to be a specialist in nuclear physics. Most of my time in Argentine I spent in problems which have very little to do with nuclear physics. This report has perhaps been too extensive and I do not at all claim that I am a specialist in the Latin-American problems in science and education. However, because of the continued specialist activities in Latin-America it might be useful for UNESCO to have my impressions available even if they may be personally coloured. I also hope that this report may be of some use for the people in the above discussed Latin-American countries who now are devoting so much of their energy in order to try to get efficiently working universities.

My wife and myself lost our hearts to the Latin-American continent in a way that we never thought was possible. It is a great pleasure to thank all the people who helped me with all kinds of problems both those ones connected with my work and problems of private nature.

First I would like to thank my predecessor Dr. Tor Ragnar Gerholm who gave me the most efficient briefing that I can think of and who also succeeded to share his enthusiasm about Latin-America already before I started my mission.

In Argentine there are especially three scientists whoose help and cooperation at all made my work possible. My most sincere thanks go to Prof. Rolando Garcia, chief of the Faculty of Sciences in Buenos Aires, Prof. Fidel Alsina, one of the directors of the Argentine Atom Energy Commission and Prof. Jose Balseiro, head of the Institute of Physics in Bariloche. My thanks go especially to all my Argentine students through whom I have learnt that nothing is in principle impossible in Latin-America. I also thank all those who helped me to convince other people the primary and most important problem in Argentine science to-day is to realize coordination, understanding and cooperation and to create efficiently working universities.