

INDO-AMERICAN RELATION WITH REFERENCE TO BERNARD PETERS*

Bernard Peters (1910-1993) was an American expert on the cosmic rays research. The results of the analysis of Peters' private correspondence and newspaper clips are presented.

INTRODUCTION

America's official relation with India started when General George Washington commissioned a Consul to Calcutta. Benjamin Joy of Newburyport, Boston, Massachusetts, who was nominated as the Consul on 19 November 1792 arrived in April, 1794 to assume his duty.¹ India being a part of the British Empire, English decisions and treaties had a direct effect on American relations until India's independence in 1947.²

So far the education is concerned, we find a few names of American scholars (mostly from the field of religion and philosophy) who visited India in the first half of the twentieth century.³ A few Indian scholars like Sudhindra Nath Bose⁴, Lala Har Dayal were also known for teaching assignments in America.⁵ As far as the history of modern science in particular physics is concerned, the exchange of ideas began in the third decade of the 20th century, when famous American Physicists like Arthur Holly Compton (1892-1962) and Robert A. Millikan (1868-1953) came to India (detail later). Their visits were related to the cosmic rays research. Bernard Peters, an American National, came in contact with Bhabha and other Indian scientists, and worked for the Tata Institute of Fundamental Research (TIFR) Bombay for 7 years from 1951 to 1958.

BERNARD PETERS - A SHORT BIOGRAPHY

Bernard Pietrkowski alias Bernard Peters⁶ was born in Posen (Poznan) in Poland on December 19, 1910. Later his family moved to Freiburg (Germany), where he did schooling. During 1931 and 1932 he studied at the "Technische Fachhochschule" in Munchen. Due to his anti-Nazi demonstration

* Contributed by **Rajinder Singh**, Fakultat V – Institut für Physik (EHF), AG Hochschuldidaktik und Geschichte der Physik, PF 2503; D-26111 Oldenburg, Germany: E-mails: rajinder.singh@mail.uni-oldenburg.de or rajinder_singh_dr@yahoo.de

he was arrested and sent to a working camp at Dachau. From there he escaped and went to Italy. Here he met a medicine student Hannah Lilien – later became his wife. In 1934 after a short stay in England they obtained a visa to the US. From this time onward for the following four years he worked as a clerk in a firm.

At a social occasion Bernard met the American physicist Julius Robert



Fig. 1. Bernard Peters (Courtesy Niels Bohr Archive, Copenhagen)

Oppenheimer (1904-1967), who encouraged the former to start study at the University of California, Berkeley. In 1942 Peters earned PhD degree. Between 1942 and 1945 at Berkeley at the Radiation Laboratory, he worked in the Manhattan project – known for the development of the first atomic bomb. In 1946 he became Assistant Professor of Physics at the University of Rochester, NY. In collaboration with his colleagues he started experiments to look at interactions in matter of the primary cosmic rays near the top of the atmosphere. To explore an opportunity for collaboration between TIFR and the University of Rochester, in 1949, Bhabha met Peters in the US. On August 31st, 1949, Peters arrived in Bombay.

After his first visit Peters was fascinated by India and later decided to stay for long time.⁷ From 1951 to 1958 he was Professor of Experimental Physics at the TIFR. After leaving India, on Niels Bohr's invitation, he moved to Denmark with his family. There he worked at the Institute of Theoretical Physics, Copenhagen. Later he established the Danish Space Research Institute. In 1966-1967 he became Director of the Danish Space

Research Institute. He retired in December 1978, however, continued as part-time adviser to the new director for some time. He breathed his last in 1993.

To appreciate the involvements of Peters let us first note the history of the cosmic rays and the initiation of its research in India.

COSMIC RAYS RESEARCH IN INDIA

Early history: Cosmic rays are high-speed particles with very high energy, which cannot easily be produced under normal laboratory conditions. The all-particle energy spectrum of primary cosmic rays (that is the rays incident on the earth's atmosphere from outer space) extends from 1 Giga [i.e. 10^9] electron volts to above 10^{20} eV or 100 Exa eV. These are the highest energies of known individual particles in the universe.⁸ As they come from outside the earth's atmosphere, by studying them, the scientists believe to solve the puzzle of universe's genesis. Still their process of production and the mechanism how they are accelerated to such a high speed are unknown. Though their exact origin is unknown, it is believed that most of them with energy below about 10^{16} electron volts originate in Supernova.⁹

About the discovery of the rays, the story goes as follows. In England, during the years 1895 and 1900, Charles Thomas Rees Wilson (1869-1859), who wanted to understand the formation of clouds under laboratory conditions, studied the behaviour of ions as condensation nuclei. In 1901 he considered the possibility of radiation outside our atmosphere with enormous penetrating power.¹⁰ But the Austrian Victor F. Hess (1883-1964) gave the first definite proof of the existence of this radiation. On August 7, 1912 he sent a balloon carrying several electrometers to measure it. He observed that with increase of altitude the radiation increases in a dramatic way.¹¹ In the 1920s the American Nobel Laureate Robert A. Millikan (1868-1953) did not believe in the existence of such rays and was one of the biggest critics.¹² Later he was also the one to coin the term the cosmic rays.¹³

By the mid-1930s cosmic rays were recognized as providing a useful source of highly accelerated particles. In those days they were the only high-energy source. The first generation high-energy instruments were the devices like the Cockroft-Walton generator, the Van de Graaff generator and the cyclotron.¹⁴ The study of cosmic rays played an important role in the elementary particle physics until the advent of accelerators in the mid-1950s.

Today for particle physics researchers the situation is far better as at present they have proton and electron colliders with energies about 10^3 and 10^2 GeV respectively.¹⁵ In spite of development in the instrumentation, even today, information on fundamental interactions continues to emerge from cosmic-rays studies. For instance the total cross sections for particle interactions appear to rise with increasing energies beyond the limits of terrestrial accelerators.¹⁶

Bhabha's Interest in Cosmic Rays

Within India H.J. Bhabha was one of the initiators of cosmic rays studies. His interest in particle physics was not by chance. His stay in Europe coincides with the period when great discoveries in his field took place. In 1927 Bhabha joined Caius College Cambridge. As a young scholar, he visited and worked with renowned physicists like Wolfgang Pauli (1900-1958) in Zurich, Enrico Fermi (1901-1954) in Rome and Hendrik A. Kramers (1894-1952) in Utrecht, Niels Bohr (1885-1962) in Copenhagen.¹⁷ In 1933 during his stay in Zurich he wrote his first scientific paper for a German journal *Zeitschrift fur Physik*.¹⁸

Between 1933 and 1938 he published 15 articles.¹⁹ The most important of them were the calculation of cross section for electron-positron scattering, i.e., the probability of the scattering of positrons by electrons,²⁰ on the theory of cosmic rays showers by the cascade production of gamma rays and positive and negative electron pairs²¹, 'vector meson theory.'²² In a short letter to *Nature*²³, he pointed out that the lifetimes of fast, unstable cosmic rays particles would be increased because of the time-dilatation effect that follows as a consequence of Einstein's special theory of relativity. The verification of this effect by means of cosmic rays experiments gave the most straightforward experimental evidence supporting special relativity.^{24,25}

In 1940 at the Indian Institute of Sciences (IIS), Bangalore, Bhabha accepted the post of Reader and became an in-charge of cosmic rays unit, specially set up for him. In 1944 he proposed the establishment of an institution that would be devoted to advanced research and teaching in physics, particularly Cosmic Rays, Nuclear Physics and Mathematics. The Institute founded at the IIS and later relocated in Bombay. As due to financial and technical reasons the purchase of a betatron was not possible, Bhabha concentrated his experimental efforts in the Institute upon the cosmic ray studies with balloons. The first balloon flights were started in Delhi in 1948.²⁶

However, the story of cosmic rays research in India is older than this as we shall see below.

INDO-AMERICAN CO-OPERATION IN COSMIC RAYS RESEARCH

Colonial period: India, cosmic rays research and American physicists

At the occasion of British Association for the Advancement of Science in Canada, the Indian physicist CV Raman (1888-1970) met AH Compton and RA Millikan. Due to an invitation from Millikan, he went to the US.²⁷

In 1926-1927 AH Compton came to India. The reasons for the visit were private as well as scientific. In an interview, Compton's wife recalled that her husband became Guggenheim Fellow. The family decided for India, because Compton's sister (who was a missionary) was living in India. Apart from that "Arthur had always thought that Kashmir would be a very valuable area of altitude and latitude for cosmic rays."²⁸ During the expedition he was helped by the Indian chemist SS Bhatnagar (1894-1955), CV Raman and other scientists. We have no definite information about the outcome of the cosmic rays expedition, but what we know exactly is that Compton stayed in India for a year and lectured at different Universities.²⁹

Already during the 1930s a world-wide survey of the intensity of cosmic rays as a function of latitude was carried out, and Madras was one of the stations. From these experiments it was established that the earth's magnetic field deflects the primary rays, which must therefore carry electric charge.³⁰

In 1940 Millikan along with H.V. Neher (1904-1999) and W.H. Pickering (1910-) came to Bangalore to perform experiments on cosmic rays. Also they delivered lectures.³¹

The fore-going discussion will show that a cooperation between the two nations had existed before India's independence.

Post colonial period: India, cosmic rays research and American physicists

In the end of the 1940s Bangalore was selected for the study of cosmic rays. Because the experiments on the primary cosmic radiation near the geomagnetic equator had to be performed to measure the East-West

effect i.e. the asymmetry in the flux of atmospheric neutrinos. The effect comes into play because the earth shadows certain trajectories of the cosmic rays, as a result of it the low energy cosmic rays from the East are suppressed compared to those from the West. Peters wrote to E.U. Condon, the Director of the National Bureau of standards Washington DC that in order to understand the effect, it is necessary to study the energy spectrum of the heavier nuclear components from helium to iron, which comprises about 30% of the number of incident particles.³²

Bhabha-Peters contacts

Peters' letter to Bhabha of date December 13, 1948 reads:

If your plans for 1949 include a visit to this country, I hope I will have the opportunity of seeing you again. I was interested in rather fragmentary accounts of your far-reaching scientific planning in India.

And further,

As a country and civilization India has always had a special appeal for me.... Rather than visit your country as a tourist, it would interest me to spend a couple of years there working and participating in some useful activity.

Due to Bhabha-Peters efforts a joint project between the University of Rochester and TIFR was started. Peters, the main person in-charge from the American side, on December 17, 1949 wrote to E.U. Condon that a project of worth about \$12000 has been granted.

Working conditions for a foreign scholar in India

In order to inculcate modern physics in India, in the 1930s efforts were made by the C.V. Raman to bring eminent scientists like Max Born (1882-1970), Erwin Schrodinger (1887-1961) and Georg de Hevesy (1885-1966). Raman was not successful, because either he did not get official support or salary was too low (as was the case of Schrodinger) or foreign expert's like de Hevesy were afraid that their knowledge will stagnate in India.³³ Peters' example indicates that in independent India, the offers made to the Visting Professors were good. For instance, after Peters' letter of December 13, 1948, Bhabha replied and assured the former a position for him and his wife who was a medical doctor. The salary per year for a

Visiting Professor was \$5959 [i.e., Rupees 1650/-per month]. It was comparable to salaries in England. Bhabha offered Peters that if he would stay at least for two years, he would also get traveling expenses to Bombay from America and back.³⁴ Before accepting the said position, Peters also imposed his conditions:

It is understood that a research budget of less than Rs. 30,000 per year, exclusive of salaries, is attached to the position. The Tata Institute will assume the expenses for traveling (by boat) of myself and my family and transportation of household good from the U.S. to Bombay and for the return at the termination of the contract. Compensation should, after deduction of income taxes, be not less than Rs. 21,000 per year, of which 30% (25% ?) will be paid in U.S. currency. The contract should provide for an option on my part to attend one scientific conference abroad every year, the traveling expenses to be borne by the Institute.³⁵

From an intellectual point of view, Peters could share his scientific ideas with Bhabha and others. He was not in the risk that his knowledge would stagnate. Apart from Bhabha there were many Visiting Professors. For instance, one of Bhabha's letter reads:

There is also, of course, a body of theoretical workers, in addition, an active school of pure mathematics in this Institute. Prof. Marshall of the University of Chicago is coming as Visiting Professor for three months next winter. Prof. Manuel Vallarta spent a short time with us as a Visiting Professor in 1948,.....³⁶

Also in the reference N. Jacobson we find a list of 45 and 39 lectures in Mathematics and Physics respectively which were delivered by known mathematicians and physicists until 1969.³⁷ Particularly from theoretical physics we find the well-known names as Paul A.M. Dirac (1902-1984), Gregor Wentzel (1898-1978), J.J. Sakurai and Walter H. Heitler (1904-1981) who came to TIFR. Another list dealing only with Mathematics which was published in 1996 contains 86 lectures.³⁸

About the scientific activities Bhabha wrote to Peters:

We have already embarked on a programme of high altitude measurements of the total and penetrating components of cosmic rays in India with the help of balloons. So far, our quadruple coincidence sets have only yielded measurements up to some 60,000 feet but we are planning to go up to 90,000 feet and to make a quantitative survey at several different latitudes in India. Work on the photographic emulsion technique was started some

months ago and we are just to embark on sending the plates up in balloons to 90,000 feet. There are several other experiments with Wilson chambers, ionization chambers, etc., in progress.³⁹

The forgoing discussion shows that the financial and working conditions were suitable for Peters. Not surprisingly he decided to come to India. However, the path was not straightforward as we shall see below.

Political tension: Bernard Peters and the USA authorities

After the Second World war America emerged as a world power. The use of the atomic bomb changed the future history. In the development of this destructive weapon, many physicists, chemists and engineers were involved in the Manhattan project. It was lead by J. Oppenheimer. The damage done by the atom bomb lead not only to world wide protests, but its builders like Oppenheimer were shocked, not only due to the destruction but also by the policies of the American government. He was one of the scientists who appealed for international control on nuclear energy. After the Russian made their first nuclear bomb test, the President Harry S. Truman (1884-1972) ordered the Atomic Energy Committee to develop the hydrogen bomb as soon as possible. Oppenheimer opposed to 'a crash course to build a hydrogen bomb'.⁴⁰

Oppenheimer being married to Kitty P. Harrion, who had been earlier married to a Communist Labour organizer did not remain in the good record and became a "security risk". The FBI recorded even his most private affairs and his sexual life.⁴¹ Interestingly enough, 'Oppenheimer was invited by Nehru to move to India when his security clearance was removed due to allegations that he was a Communist sympathiser.'⁴² It will be of interest to know that earlier Oppenheimer had betrayed Peters and his wife due to communist activities (detail below).

In a letter of December 17, 1949 Peters wrote to Condon that after he applied for a passport for the India trip, next day an agent from the State Department appeared with the instructions to collect his old passport.

Chief of the Passport Division Mrs. R.B. Shipley asked Peters to submit a letter from the Office of Naval Research (ONR) as the experiments were to be carried out under its contract.⁴³

Peters who was somehow suspicious asked Condon not to interfere in the matter. The latter was sure that Peters will get the passport without trouble, as according to his observation at the time the American policies towards India were friendly and cordial (a misjudgement as we shall see later). Condon, who was shortly visiting India, had no time. He promised Peters that in case there were difficulties he would talk to Bhabha to put diplomatic pressure from the Indian Embassy.⁴⁴

Peters' judgement was correct. *The San Francisco Chronicle* on January 12, 1950 revealed that the Navy denied a published report that it had acted to stop Peters from getting a passport. Similarly the officials of the State Department Division said that Peters' application was in "pending" status. *The San Francisco News* on January 12, 1950 published the headlines, "Departure halted – navy bans atom expert's sailing – Red suspect refused passport to India" and the subtitles as "quite a red" and "once German red". The headlines of the Washington Daily News were more dramatic, namely, "Navy moves to keep 'red' Professor out of India". And further:

Dr. J. Robert Oppenheimer, noted atomic scientist, had told the house Un-American Activities Committee Dr. Peters was 'quite a Red'. He is still under investigation by that committee for suspected espionage activities while employed at the Berkeley atomic laboratories of the university of California during the war.⁴⁵

Peters testified before the committee and denied such charges.

Alvan Valentine – President of the University of Rochester and George B. Collins – Chairman, Department of Physics supported Peters. They wrote a letter to the Senator Herbert H. Lehman and explained that there was no relation between cosmic rays and the atomic bomb. This is a correct statement except for the fact that all branches of physics are basically connected and the laws governing cosmic rays govern the action of particles in an atomic bomb. He further wrote that the State Department misunderstood this link that is why the questions of security enter. Collins was also of the opinion that Indian men of science will be disillusioned as they have generously and wholeheartedly started a program of scientific collaboration with scientists of the United States.⁴⁶

Bhabha received Peters' letter of February 8, 1950. At the occasion of inauguration of a National Physical Laboratory, in the presence of governor

general, Prime Minister, Deputy Prime Minister of India and other distinguished people he told publicly that Peters was being expected shortly in India for cosmic ray work to be undertaken in co-operation with workers at this Institute.⁴⁷

In this whole story, the real intention of the US authorities becomes more evident from the February 27, 1950 dated document: "*Memo ref passport authority – Department of State ref Peters.*" Its first paragraph contains well known words such as: if information is 'confidential', "against the national interest" the state may refuse to give more information and so on. However a portion is of interest to read:

It should be pointed out, that the denial of a passport does not necessarily mean that the person denied such a privilege is objectionable *but that the country to which he might desire to travel is found to be undesirable "in the national interest"*. I think that this is *especially pertinent with respect to India*, since, as you know, our relations with India have not been to friendly and there is the oft expressed fear that Indian might be more than "*merely friendly*" *with communist government* (emphasis added).

We have seen above that according to *The Francisco Chronicle* of January 12, 1950 the Naval Office Authority publicly declared that they are not against Peters' visit, but according to Shipley's letter to Peters: "You state that the project was 'sponsored' by the University of Rochester and by the Office of Naval research "both of which have supported" your application. In reply. I beg to say that you are under a mis-appreciation in believing that the Office of Naval Research is supporting your application for a passport. That office has given a letter testifying to your scientific competence and its interest in the project but it stated that this information "*in no way be construed as Naval sponsorship for clearance in connection with travel outside the country.*"⁴⁸

Peters also sought help from the Atomic Energy Commission (AEC) that could better judge about the question of security from the point of view of physics. Summer T. Pike, Acting Chairman of the AEC did not interpose any objection to the granting of the passport.⁴⁹

Peters' next letter shows his psychological condition. He was ready to migrate to another country, but without passport this was impossible. He was ready to go to India if the Indian Government will accept him and offer him a position as told by Bhabha in his previous letter.⁵⁰

In the end of August 1950 the situation changed. *The Rochester Time Union* of September 12, 1950 shows that in fact it was the Navy Department that hindered the issue of the passport. ‘The project was transferred to full control of the AEC on July 1, which soon afterwards asked the State Department to approve the passport’. To support Peters’ case the AEC spokesman said that he (Peters) was the only man available in this field who was able to handle the project and India was the only place in the world where this experiment could be performed. Moreover, India was densely populated and the risk of loss of balloons was minimum.

Peters’ first visit to India

Peters’ visit was for four months. His letter of date November 27, 1950 written from Madras suggests that the required results were not achieved, as many balloons were technically defect, some burst in passing the turbulent region between 50 and 60,000 feet and only one balloon was able to get beyond 90,000 feet with very moderate load about 2 pounds.^{51,52}

During this visit Peters also came in contact with eminent Indian physicist C.V. Raman who invited the former to attend the Sixteenth Annual Meeting of the Indian Academy of Sciences.⁵³ Peters who had enjoyed very much the recent meeting in Bangalore, with Raman, turned down the invitation as he had to leave India on 23rd of December 1950.⁵⁴ His last written communication with Raman was on September 1, 1966, in which he along with MGK Menon and R.K. Asundi submitted the name of two Indian scientists for the Fellowship of the Indian Academy of Sciences.

During Peters’ stay in India, he met not only Raman but also Meghnad Saha (1893-1956). From Saha’s letter of December 21, 1950 it is not clear whether he had seen the experimental results obtained during the flight or was there for a theoretical discussion on the existence of Neon gas in the sun atmosphere. Saha observed that Harrison Brown’s argumentation regarding its existence in the sun is wrong. In the same letter Saha wrote:

I have written to my former pupil, Dr. P.C. Bhattacharya who is now at the National Research Council, Toronto to write to you, and if possible to spend sometime at Rochester in your laboratory. I hope you will be able to accommodate him and give him facilities for learning the plate technique for balloon flight at 95,000 feet and the instrumentation needed for such work.⁵⁵

After his four months stay in India, Peters returned back to the USA. *The Rochester Times Union* wrote on January 18, 1951: “Scientist home from India with cosmic ray photos.”

During his stay in India Peters had written a formal letter to Bhabha in which he stated the conditions, under which he would like to work. Following Bhabha’s suggestion he formulated his duties as follows:

Directing the research of the photographic plate group. Being available for consultation for the other research groups at the institute. Teaching one course per semester and additional courses by mutual agreement if desirable. Taking part in the scientific seminars of the Institute. Carrying out of research.⁵⁶

The financial and working conditions offered to Peters were good. Apart from that he needed not to be afraid of political harassment. After going back to the US, within a few months he made his decision about leaving the country. *The Rochester Times Union* on August 21, 1951 reported that “A scientist at UR gets job in India”. The news revealed some more facts, namely, the AEC had written two letters to support Peters’ case, and more importantly:

According to *The Time-Union Washington Bureau*, Dr. Peters’ Original visit to India was described at the time as ‘non-classified’ project having to do with cosmic rays. However, some scientists connected cosmic ray research with AEC efforts to develop a hydrogen bomb 1,000 times more powerful than the present atom bomb or with an even more potent form of nuclear fission having to do with the gamma ray.

Peters at the TIFR

Peters came to India with a two years contract with the TIFR. During vacation he planned to visit Kashmir but soon he found that the concerned Government office was not handling his application “in a routine manner”, as he wrote to Bhabha. He felt the Government of India had no confidence in him. He threatened Bhabha to break the contract. Peters wrote:

Only if this confidence is complete, and if as a matter of routine the ordinary facilities and permits are extended to me can I consider working here for an extended period and complete the research program which is now in progress.⁵⁷

Peters, who was living in India with his family, still had American nationality. His tussle with the US authorities did not end. *The Times Union*,

of September 27, 1955 wrote a long article entitled, “Ex-.....Scientist looses citizenship”. It revealed more than one fact. First Peters traveled to Europe with a passport issued by the Federal Republic of Germany with the right to re-enter India. Second, Oppenheimer who in-between was labelled as “security risk” by the AEC was removed from all positions connected to the US nuclear weapons programme. Third, Oppenheimer, not only denounced Peters but also his wife as ‘*at the Oppenheimer security hearings, Dr. Hannah Peters was named as organizer of the professional section of the Communist party in Alameda County (Berkeley), Calif., in the period 1942-45.*’ However, the news with “looses citizenship” was published in a hurry and probably based on official sources. Peters responded and *the Times Union* in its October 31, 1955 issue had to correct itself. Peters sent a copy of his letter dated July 14, 1955 that he had sent to the Consul of the United States, Constitution House, Ballard Estate, Bombay. In the letter he had protested that for more than a year his passport had not been extended. ‘*I therefore regret to inform you, that I shall give up my rights and duties as an American citizen*’, wrote Peters. It was evident enough that it was not the decision of the US authorities, but that of Peters. Accordingly the newspaper gave the heading: “Give up citizenship, Dr. Peters says.”

Peters became an integrated part of the Indian scientific community. In 1956 at Agra, at the annual meeting of the Indian Science Congress Association, he delivered the Presidential address of the Physics Section, and talked on “The Primary cosmic radiation”, in which he described the state-of-the-art of cosmic rays research and the applications of the rays in different fields such as geophysics, oceanography, meteorology, astrophysics, and cosmology.⁵⁸ Different references given in “Cosmic ray produced radioactivity on the earth” by Devendra Lal and B. Peters indicate that most of his work remained limited to this field.⁵⁹

About Peters’ work in India the historian Robert S. Anderson quoted the Indian Scientist Yash Pal as follows:

Before Peters’ departure, he had worked with Drs Rama and [D.] Lal on the formation of a group in geophysics which grew very rapidly and did studies on problems relating directly to India, but of fundamental nature. In this Bhabha gave his full support, and may have appreciated the role of Peters as an “outsider agitator”.⁶⁰

Further the author quotes Peters:

He took a more “radical” position than Bhabha on changing the work-relations within these groups, on getting younger people to be critical of their seniors’ ideas in research, and on generally breaking barriers between people traditionally held apart by great differences in social background....⁶¹

In 1959 Peters left India for Denmark. During his stay in Denmark his contacts with Indians remained in tact. In 1985 the President of India decorated him with the *Padma Bhushan*, which is awarded to recognize distinguished service of a high order to the nation. On Peters’ 80th birthday, *Current Science* published a special section, which contains appreciation by some of his students and collaborators.⁶² Peters’ last letter written to an eminent Indian physicist was in 1992. It deals with Peters’ meeting with C.V. Raman during his stay in India.⁶³ In 1993, when Peters expired, his long time collaborator D. Lal – a known Indian physicist wrote an obituary, in which author explored not only the details of Peters; his stay in India but also the achievement of the group that was founded by him.

CONCLUSIONS

- Indo-American relations had their ups and downs in the past. Before India’s independence the exchange of scientific ideas among the individual scientist was free. After the Second World War, the USA emerged as a World Power and India as an Independent country. The latter was eager to have science and technology, the opposite interests lead to that. In spite of some misunderstanding, the two states were forced to cooperate with each other.
- In the late 1940s and beginning of the 1950s the high ranked American physicists were sometimes too naïve to judge America’s political policies towards India. However, in independent India many American scientists reacted more friendly towards their Indian colleagues.
- Within a short period of about 2 decades, the cosmic rays research was established, partially it was due to foreign experts, but mainly due to the support of Indian Government.
- High ranked experts like Peters” have no difficulty in adjusting them in a so called “Third World Country”

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