

13-01 hrs.

**DEMANDS FOR GRANTS\*—Contd.**  
**DEPARTMENT OF ATOMIC ENERGY—**  
**Contd.**

**Mr. Speaker:** I will now request the hon. Prime Minister to reply to the debate.

**The Prime Minister and Minister of External Affairs and Minister of Atomic Energy (Shri Jawaharlal Nehru):** Mr. Speaker, the debate on the Demands for the Atomic Energy Department has been, in a sense, a most gratifying one, because, almost every Member has expressed his general approval of the work done by this department and the advances made. Some criticism have been made or rather some suggestions have been made on various matters connected with that department. I shall refer to them briefly.

One thing which has often come up before this House in the shape of questions, etc., is the question of the mineral sands in Kerala, especially the export of ilmenite. I have repeatedly gone into this matter. A crisis has arisen because of circumstances entirely beyond our control and partly conditions created within the industry itself. The emergence of new and cheaper sources of ilmenite or substitutes in other countries, the existence of certain natural impurities like chromium and vanadium in Indian ilmenite and the recent technological developments in the manufacture of titanium dioxide pigment partly resulted in this. Anyhow, this matter has been very carefully looked into. Every effort is being made to find export markets. In fact, some success has already been attained, I believe, in finding a market in the United States and possibly, there is a possibility of finding one in Japan also. The whole matter deserves to be looked into and it is being looked into. Unfortunately, the conditions under which this industry was run came in the way of the industry itself. The State Government, at that time, charged a royalty of 75 per cent

which also added to the lack of competitiveness of the mineral in the world markets in selling price and stocks accumulated, and it was impossible to carry on the factory. The selling price of ilmenite has now been considerably reduced and an intensive sales promotion campaign has been launched and also an experiment to eliminate the impurities in Indian ilmenite. If all these succeed, as we hope they will, the intention is to set up a modern factory and to enter the world market on a more competitive basis.

Another point that was referred to was the Pay Commission's report. I think the Pay Commission's report has been not only fully given effect to, but in some instances, the Atomic Energy Commission has gone rather beyond it. I should like to inform the House that the Scientists in the Atomic Energy Commission are almost all, barring very few, quite young men: some, certainly a very large number of them, under 40 and some under 30. Yet, they hold very responsible positions. They are heads of departments and they have done remarkably good work. Unlike many other departments of Governments, routine methods employed usually in the Government about promotions, etc., are not followed there, and ability, as soon as it is evident, is recognised immediately.

**Shri Ranga (Chittoor):** Is that possibly the reason why a large number of them—they have written to the Prime Minister also—frequently leave this service and seek other service?

**Shri Jawaharlal Nehru:** I do not know that a large number have left. Some may have left. There are 3000 atomic scientists working there. I do not know how many have left. I cannot say now. In answer to a question, I gave figures. There are not many; a few.

\*Moved with the recommendation of the President.

Shri H. N. Mukerjee said something about the Saha Institute of Nuclear physics in Calcutta. He thought that perhaps enough attention was not being paid to it. I may tell him that in the Third Plan, the grant-in-aid to this Institute has been raised to Rs. 95 lakhs as compared to Rs. 55 lakhs in the Second Plan. The difficulty is that the cyclotron is not functioning. The cyclotron is an old fashioned one and it is now completely out of date. It has to be replaced as a whole to allow it to be used. This is a fairly big operation involving foreign exchange.

Then, there was some reference to the Tata Memorial Hospital for Cancer research. This matter was gone into very carefully at the time we decided to put it under the Atomic Energy Department, consulting the heads of the hospital department and others concerned. As a matter of fact, in some countries where these matters are specially investigated like the U.S.A., they have got special hospitals under the Atomic Energy department to study the effect on cancer of atomic treatment by radio isotopes. It was thought that this would be more effectively and efficiently done if it was placed under the Atomic Energy department.

Then, there are two or three matters, and I should like to make a special reference to them. One is, an hon. Member said something about our manufacturing nuclear weapons, nuclear bombs. This question can be looked at from the point of view of theoretical approach, if you like, an ethical or moral approach, or a purely practical approach even though it might offend a certain ethical approach to the problem. We have often said, from the very first day that we started the reactor in Bombay that we on no account would manufacture nuclear weapons, weapons with nuclear energy, and I have repeated that several times. I hold to that. I shall not go into the ethics or morality of it. I do think that it is a very powerful case made out, but from the practical point of view, it is, I think, en-

tirely wrong to think or imagine that by our producing a bomb, a nuclear bomb, our defence is strengthened thereby, or to put it in another way, as we are thing of Chinese aggression, that the Chinese, by succeeding perhaps in a test, become stronger in their military capacity.

At the present moment, there are only two powers which have an abundance of nuclear weapons and they are the Soviet Union and the United States of America, with the United Kingdom following a good deal behind, and another country like France having also exploded various nuclear devices, but yet it is very doubtful if even France, although it has exploded these devices....

Shri Hari Vishnu Kamath (Hoshangabad): Very recently.

Shri Jawaharlal Nehru:.....has really enough for any purposes of offence. Exploding a nuclear device does not mean that you have got a large stock which you can use, or any stock at all. It would take years and years, even if such devices were exploded, quite apart from the enormous sums of money required, quite apart from the facilities for doing so. By facilities, I mean this. Now, the United States has done it over vast areas in the Pacific Ocean and some other places. It is a huge country. The Soviet Union has done it in the Arctic wastes. You cannot easily do it in an inhabited area.

Very recently, only a few days ago, France exploded such a device underground, I think, in the Sahara desert, and people in the countries round about there in Africa, and more especially, Algeria, have been greatly upset and greatly exercised about it. Naturally, we regret this greatly that they should have done it, although what they have done I understand, is inkeeping with the arrangement they arrived at with the Algerian leaders, at the time of their treaty, that is, it is stated that they could do it in the Sahara; but the fact remains, I suppose, that the arrangement was arriv-

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ed at under pressure of circumstances, and although technically it may be right, it is unfortunate that they have exercised that right, because that will mean a lot of ill-will in Africa, when what is most required is, especially as between Algeria and France, good and co-operative relations.

So, to imagine that by our working for atomic weapons, atomic bombs and our succeeding in making one—it is quite possible; in fact, it is a question of a little time; if we had started doing it, perhaps, even now we might be ready with it, with the tests....

**Shri Hari Vishnu Kamath:** Money also.

**Shri Jawaharlal Nehru:** Money, of course, and also place. We may spend enormous sums of money on it and thereby stop some other work. Obviously, it cannot be added on. But the real thing is, having done it, what do we gain by it except some psychological advantage that we can do it? Or, suppose China does it, one day you hear that they have exploded a test device; it has no relevance to military capacity then; but it may have ten years later or twenty years later, but it will be evidence of a certain advance for China, and that psychologically may affect it. People should not be led away by these considerations.

I say then, from the most practical point of view, apart from the moral and the ethical which are important, that it is right that we should adhere to our decision not to use atomic energy for the production of any weapons, that is, nuclear weapons. On the one hand, we are asking the nuclear Powers to give up their tests. How can we, without showing the utter insincerity of what we have always said, go in for doing the very thing which we have repeatedly asked the other Powers not to do? But, as I have ventured to point out, apart from that, although that is an adequate reason for it, apart from that,

it does not really add to our defensive strength. It may indeed reduce it by turning large sums of money, towards it instead of to other more practical uses.

Another hon. Member said 'Why do we spend so much money then if we are not going to use it for this purpose?', and he said 'If we should not use it for making weapons, why do we spend so much money on this development of nuclear energy?'. Now, that showed, if I may say so, with all respect, a strange misconception and misunderstanding of the whole business.

Nuclear power, or nuclear energy, is a very vital thing. We live on the threshold of the nuclear age; we have entered it, if you like. In the future, this power will be used more and more; we hope that it will not be used for destructive purposes but it will be used, let us hope, for constructive purposes, and a country which does not acquire knowledge of nuclear science fully and which cannot use that power will be left behind, as we have been left behind in the last century or more because of new development of electric power and steam power etc. Therefore, it is quite essential to live, if we want to, up-to-date in the modern age, and to profit by these new discoveries of power.

It is possible for you to write the history of the world in terms of the power resources used from time to time. For a long long time power was limited to human power, animal power, etc., or you may say, as they have said, as has been used in India for very long and even now, cow-dung power. Then came other things; then came steam; then came electricity. And suddenly, there is a huge spurt in the world's progress. So, it is power that makes all this difference, and there can be no doubt that in atomic power—it is likely to develop more and more in various ways, with

cosmic energy being used and others—we must be up-to-date. And we are fortunate in having a very good atomic energy establishment in India which is doing very substantial work, and it is recognised all over the world that it is doing good work.

As hon. Members know, we are going to have a station at Tarapore in Maharashtra, another station in Rajasthan near Rana Pratapsagar, and a third one in Madras. We hope that we shall be capable of building the third one entirely by ourselves.

As for the Tarapore station, we have been discussing with certain American agencies certain points in regard to which there is some difference of opinion. Nearly all the points have been resolved now by personal discussions, but one or two important points still remain. I hope that they will be resolved fairly soon, so that we can go ahead with this, but I cannot be absolutely sure.

**Shri Ranga:** May I seek a clarification? We were given to understand when this atomic power station was being set up that every care would be taken to look into the economics of it to see how it functions, whether its economics would not be too costly for us and the energy would not be too costly. But long before it is commissioned, how is it that Government have already launched two more projects, two more stations?

**Shri Jawaharlal Nehru:** Because all these calculations have been done.

**Shri Ranga:** Only calculations. No experience so far.

**Shri Jawaharlal Nehru:** Yes, experience.

**Shri Ranga:** We are still developing it. It has not yet been commissioned.

**Shri Jawaharlal Nehru:** Still one can know it.

**Shri Ranga:** How much is it going to cost?

**Shri Jawaharlal Nehru:** It is calculated fairly accurately with the experience of other countries and our own experience.

**Shri Ranga:** In England they stopped it. We thought we were taking a lesson from English experience. We were told that at a later stage England thought it fit not to go ahead with atomic energy projects because they found it too costly. Only recently they were again trying to discuss that matter.

**Shri Jawaharlal Nehru:** I cannot enter into the economics of it here. But the matter has been discussed quite adequately, and we have had Dr. Bhabha addressing Members of Parliament at least on two occasions on this very subject. He has written about it on various occasions showing by facts and figures how the economics of it are quite feasible.

Hon. Members might remember that even in the President's Address to the joint sitting of the two Houses, reference is made to this matter. It is stated that in the particular area, locations of the power projects, the economics of atomic energy are actually cheaper than the conventional methods of producing energy. That is, it would not be cheaper at the pithead where coal is available; it would not be cheaper where hydro-electric power is available in abundance, but as soon as you go away from those places and go to Rajasthan or somewhere else where coal has to be brought and transport charges are heavy, it is cheaper. Anyhow, that is generally admitted now.

**Shri Ranga:** It is expected to be cheaper.

**Shri Jawaharlal Nehru:** It is generally admitted now by various authorities who have gone into this matter that economically it is cheaper in certain circumstances and it tends to become more and more cheap.

Anyhow, from the point of view of India and the demand for power here,

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it is of extreme importance that we try to encourage every attempt. It may be that the first attempt is not quite 100 per cent. successful; it is only 90 or 80 per cent. It may be that the first effort is not quite cheap; the second or third may be. But unless we go through those processes, we shall not reach that stage. But at the present moment, even the first power station that we are building is calculated by all normal processes of statistical calculations to produce power at a cheaper rate than in many of our hydroelectric and like schemes. Of course, they vary greatly—these schemes. If I may give some figures—these are based on actual tenders; so there is not much of guess-work about them—for the Tarapore atomic power station, the actual tender which we are likely to accept is Rs. 1275 per kw. The cost per kw. of installed capacity of Rihand station is Rs. 1235—slightly less; of Yamuna Stage II Rs. 140 per kw. and Uhl Stage II Rs. 1574 per kw.

**Shri Banga:** We compare it with the costliest on the other side and say it is economical. It has not yet produced.

**Shri Jawaharlal Nehru:** I am venturing to tell him some facts. Even though they have certain advantages—Rihand has a hydroelectric power station there—even there the cost is only slightly less; in some cases it is far more.

Generally speaking, it is expected that with these atomic power stations, the cost of electric power produced will be very favourably comparable with the power produced by thermal stations. But I would submit that even if at that stage where it is not established—it is practically established because we are having reputable firms in this and no firm is going to take a chance to lose by it—even then it is desirable to carry on, because these are initial stages of development of new power, new energies, new

sciences, and no country, specially a big country like India, can afford to ignore these developments. Normally, hydroelectric stations tend to be a little cheaper than thermal stations; that depends on how far you have to carry coal.

An hon. Member asked if the Tarapore station had been guaranteed by the American firm who are entrusted with the building of the stations and whether any penalty can be enforced in the event of shortfall of performance. The answer is yes; in the event of actual performance falling short of guaranteed performance, the firm will either rectify the defect in the plant responsible for the shortfall at their expense or will pay compensation which will be proportionate to the extent of the shortfall.

**Dr. K. L. Rao** wondered whether it was necessary to spend considerable time and effort at site selection. I am surprised at this, because the selection of a site is not at all a simple or easy matter. It has to be very carefully considered, quite apart from the desire of many States to have it. It is not that only. In fact, the selection of location of even a major factory is not a simple matter. You have to consider all manner of things; but specially in the case of an atomic energy plant, it is of great importance that it should be selected where the most favourable conditions prevail.

He suggested that space research is an important branch of scientific activity and it should be entrusted to a different agency. Yes, it may be, if our work in it grows adequately. It is no good having a separate department for every piece of work that we do. After all, although we are doing well in all these works, the number of trained hands is limited. We have now in Trombay for atomic energy work something like—I do not remember the exact number—3000—4000 scientists. Space research is partly under the direction of the Tata Institute of Fundamental Research, which

is under the administrative control of the Atomic Energy Department.

**Shri Hari Vishnu Kamath:** Are you launching anything or anybody into space?

**Shri Jawaharlal Nehru:** I cannot offer to take the hon. Member into space just yet!

**Shri Hari Vishnu Kamath:** I would like to go together with you, good company!

**Shri Jawaharlal Nehru:** Then there is a laboratory at Ahmedabad under Dr. Vikram Sarabhai which is also working under the Department of Atomic Energy in regard to space research. This laboratory is actively participating in the programme of space research undertaken by the Indian National Committee for Space Research.

Dr. Gaitonde commented on the fact that the United States issue reports of the number of accidents that they have had in the working of atomic energy. He asked: why have we not produced some such figure or report? For the simple reason that we have had no accidents. We have taken quite enough care and precautions to avoid accidents and fortunately we have had no accidents.

It is natural for some hon. Members to compare the growth of atomic energy work in India with China. It is difficult for me to do that. From time to time we hear reports that there is going to be a test explosion. In fact, some time ago it was even said that there had been an explosion somewhere in Sinkiang. It is rather doubtful whether there has been, because it has not been recorded in any foreign observation post. Other such explosions have been recorded even at Trombay. So, I doubt very much whether this has been taken place, and I cannot possibly say it will not take place. But our impression, based on such knowledge as we possess, is that, broadly speaking, our atomic energy

work is more advanced generally, I do not say in any particular branch of it, than in China. It may be, of course, that they concentrate on one aspect of it, and show some results in that aspect, and manufacture a nuclear bomb. On the whole, I feel this House has reason to be satisfied with the kind of work we have been doing at Trombay and other places, and we can look forward hopefully to its progress.

Some hon. Member opposite said: why do you start explorations, waste so much money on it, and then stop it? I do not quite understand that criticism, because we have to explore in various places. Where it leads to results, we carry on; where it does not, we stop it. We simply write off what has been spent there. That applies to every kind of exploration whether it is oil or anything else.

That is all I have to say.

**Shri Hari Vishnu Kamath:** By your leave, may I ask a question? With which countries has India concluded bilateral agreements or other informal co-operative arrangements with regard to research on the peaceful and non-peaceful uses of atomic energy, and how many communist countries, China of course excepted, are co-operating with us in this respect?

**Shri Jawaharlal Nehru:** I have not got all that information, but I have given that in answer to some questions previously. The main countries, obviously, with which we are co-operating are the Soviet Union, USA, UK and France. We are in touch with some of the east European countries also.

**Shri Hari Vishnu Kamath:** Are there formal bilateral agreements or informal arrangements?

**Shri Jawaharlal Nehru:** We have bilateral agreements not for this particular purpose, but generally in the scope of the other bilateral agreements this work comes in.

**Shri Priya Gupta (Katihar):** What about filling the post of the Director of the Minerals Division of the Atomic Energy Department after the death of Dr. Ghosh, which was raised by my hon. friend Shri Surendranath Dwivedy, and amenities to the staff employed therein?

**Shri Jawaharlal Nehru:** I am told that the search for a suitable person continues.

**Shri Priya Gupta:** But you say there are many capable persons there.

**Shri Shivaji Rao S. Deshmukh:** I had made the point that as a result of a change in the design of the Tarapore atomic power station, the atomic fuel which will be utilised there could not be processed in India and we would be totally relying on UK for the vital requirements. How far do we propose to proceed in processing the atomic fuel for Tarapore, and when can we hope to be self-sufficient?

**Shri Ranga:** The same thing applies to the other two projects also.

**Shri Jawaharlal Nehru:** What the hon. Member has said is very much in our mind. We would like to be as independent in this matter as possible, but any other procedure now would have involved huge burdens on us. So, for reasons of economy we did it, but in future we shall depend upon ourselves more and more.

**Mr. Speaker:** There are no cut motions. I will put the Demands.

The question is:

"That the respective sums not exceeding the amounts shown in the fourth column of the order paper, be granted to the President, to complete the sums necessary to defray the charges that will come in course of payment during the year ending the 31st day of March, 1964, in respect of the heads of demands entered in the second

column thereof against Demands Nos. 106, 107 and 147 relating to the Department of Atomic Energy."

*The motion was adopted.*

[The motions for Demands for Grants which were adopted by the Lok Sabha are reproduced below—Ed]

#### DEMAND NO. 106—DEPARTMENT OF ATOMIC ENERGY

"That a sum not exceeding Rs. 14,42,000 be granted to the President to complete the sum necessary to defray the charges which will come in course of payment during the year ending the 31st day of March, 1964, in respect of 'Department of Atomic Energy'."

#### DEMAND NO. 107—ATOMIC ENERGY RESEARCH

"That a sum not exceeding Rs. 7,79,18,000 be granted to the President to complete the sum necessary to defray the charges which will come in course of payment during the year ending the 31st day of March, 1964, in respect of 'Atomic Energy Research'."

#### DEMAND NO. 147—CAPITAL OUTLAY OF THE DEPARTMENT OF ATOMIC ENERGY

"That a sum not exceeding Rs. 15,09,20,000 be granted to the President to complete the sum necessary to defray the charges which will come in course of payment during the year ending the 31st day of March, 1964, in respect of 'Capital Outlay of the Department of Atomic Energy'."

13. 37 hrs.

#### MINISTRY OF HEALTH

**Mr. Speaker:** The House will now take up discussion and voting on