[Shri Humayun Kabir]

to give an answer. The first edition of the atlas sold out and we are trying to reprint it as soon as possible. I believe, we will be able to meet the shortage fairly quickly.

Mr. Speaker: There are only two cut motions, Nos. 1 and 3. May I put them together?

Some Hon. Members: Yes.

All the cut motions were put and negatived.

Mr. Speaker: 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. 81, 82, 83, 84, 85, 86, 87 and 137 relating to the Ministry of Scientific Research and Cultural Affairs."

The motion was adopted.

Dr. L. M. Singhvi: Sir, before we take up for discussion the other Demands I should like very much to make the plea to you that it was felt in all sections of the House that the time allotted for the Ministry of Scientific Research and Cultural Affairs was much too short. I think, the hon. Minister had also concurred with it. Now that the hon. Minister of Parliamentary Affairs is here, I may submit that you may consider the claim of this Ministry for allotment of more time next year. It was much too short. We cannot possibly discuss anything within that time.

Mr. Speaker: I cannot say whether I will be there next year or not and it has to be decided then. This time it was put to the House and no hon. Member objected to it. When the House accepted it at that time, what can I do? If the hon. Member had objected to it at that moment, perhaps the House might have considered it. Probably, by next year some hon. Members might forget that he had taken exception to it.

DEPARTMENT OF ATOMIC ENERGY

Mr. Speaker: The House will now take up discussion and voting on Demand Nos. 106, 107 and 147 relating to the Department of Atomic Energy for which 2 hours have been allotted.

DEMAND NO. 106—DEPARTMENT OF ATOMIC ENERGY

Mr. Speaker: Motion moved:

"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

Mr. Speaker: Motion moved:

"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 the 31st day of March, 1964, in respect of 'Atomic Energy Research'."

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

Mr. Speaker: Motion moved:

"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'."

Mr. Speaker: These Demands are now before the House. Shri Mukerjee.

The time allotted is only two hours and I hope he will take only his own share.

Shri H. N. Mukerjee: Mr. Speaker, Sir, I rise to speak with some hesitation on the Demands of the Atomic Energy Department partly because I am deputising at short notice for somebody else who should have spoken but also because I am conscious more than ever of my being completely illiterate in matters of science and technology. Even so, I expect, I could, on the basis of a commonsense reading of the reports which the hon. Prime Minister has supplied us, praise the good work which has been done by the Atomic Energy Deparment.

It is a proud thing for us to find whenever we are in Trombay or read about it that Indian technologists are no longer merely maintenance engineers—they are not merely copyists; they are proving their own worth. I was very happy when I read in the papers a statement by Dr. Bhabha that the third atomic power unit that is going to be set up a little while later would be entirely designed, fabricated and constructed by Indian scientists. This is a matter on which surely the country can congratulate itself.

Atomic energy is important because while our economic growth might appear to be impressive if we happen to be rather modest in our aspirations, we all know that it is by no means enough and we know very well in particular that the power requirements of our country are bound to grow at a staggering rate with the development of our economy. Therefore it stands to reason that all sources of power, conventional or unconventional, should be harnessed into use in an integrated manner. In regard to this we have been told many times how there are certain parts of our country, specially in the South, which are far away from the coal belt where on account of the absence of snow-fed rivers, hydro-electric development also be certain difficulties and therefore nuclear power should be the answer for the future.

What I wish to say in this connection, however, is that I do hope that while the importance of nuclear power is by and large recognised, even though sometimes the figures which are shown us appear to be rather on the high side, we do hope that at least attempts are being made by Government to co-ordinate the effort, the total effort, in regard to power generation in the country. Only today I got a report, the Thirtieth Report of the Estimates Committee, and I discovered there a recommendation of the Committee which wishes Government to prepare blueprints of all the remaining hydro-electric schemes since hydel is the cheapest source of power in India and make sure that in the Third Plan and in the Fourth Plan also there is not a shortage which can be avoided.

I know that nuclear power, unconventional power sources have got to be utilised in our country and to that extent whatever is being done or is sought to be done by the Atomic Energy Department deserves our support. But I do hope that there is a sort of co-ordination in the effort so that we know what is going to happen at the time when the Third Plan terminates or a little while later. I do hope that there is a kind of effort, if that is possible, technologically speaking, at co-ordination between conventional and non-conventional sources of power.

I noticed from the report of the work of the Atomic Energy Department that lately under its auspices there has been set up a sounding rocket project in Kerala which has had international support, specially the support of the United Nations Committee on the Peaceful Uses of Outer Space. I have read in the papers

[Shri H. N. Mukerjee]

how the site is unique and offers unparalleled opportunities for scientists and I do hope that it becomes a centre where our Indian scientists as well as their foreign friends can cooperate together.

I notice also that in a recent seminar in Ahmedabad—Seminar on Space Physics—Dr. Bhabha spoke, and according to the press reports, he is reported to have said that the project to put a man on the moon and to retrive him might cost twice the outlay on the Third Five Year Plan. Now, this is the kind of thing which sometimes strikes some of us. When I was recently reading the reports of the United Nations Conference on Scienec and Technology, especially with a view to helping the underdeveloped countries—it was held in Geneva—I had a feeling that perhaps —and I know a great deal of work was done at the Conference; our representatives took a very large share, Prof. Thacker presided and Dr. Bhabha and others spoke in that conference—sometimes more glittering prospects of scientific advance are being put forward, and as far as we are concerned, we sometimes think that, maybe, even the maximisation of the conventional technological resources might help in solving the problems which are facing us so very sternly; and by this I do not wish to suggest that therefore we should be rather chary of supporting rather unconventional enterprises as is represented by the atomic energy project. I have already expressed my appreciation of its work. But I feel that there is a feeling in the country that perhaps these glittering things are being given a certain amount of importance which might wait till the day after tomorrow and in the meantime we might maximise the utilisation of other technological resources. I do hope that the Government keeps that in mind that while we do make plans regarding the atomic energy projects, we go ahead faster with scientific research schemes that we have already got. I say this especially because of what my hon. friend the hon. Minister for Scientific Research and Cultural Affairs has just said in his reply to the debate in regard to his Ministry.

I have a feeling also that in regard to the third projetc which is to be set up in the South, somewhere near Mahabalipuram, and I do hope that it is sought to be expedited if that is technically feasible. In the South there is the prevailing feeling that as far as the utilisation of its resources is concerned, the Central Government is not doing as much as it should. Now that the third project has been allotted to the South, I do hope it is done as quickly as it can.

Then, I discovered one little matter which seemed to me somewhat disturbing and that was in relation to the work of Travancore Minerals Ltd. which in regard to one or two of its branches appeared to have shut up shop and caused a certain amount of retrenchment of qualified workers. I have been supplied a copy of a communication sent by some Members of Parliament to the Prime Minister regarding the closure of the Minerals Co. at Chavara—I think, it is somewhere in Kerala—and in this communication certain suggestions are made of which I do hope the Government has taken due note. The allegation has actually been made that while foreign exchange was earned to a certain extent by this industry, very little was spent for research, for the study of market trends, and the result is that the demand for ilmenite seems to have come down in the world market and that is why closure has taken place. If this communication gives us a correct idea, from American buyers there had come the complaint that there was the presence of chromite in ilmenite, but no research was conducted to eliminate chromite by physical or chemical process, perhaps there could have been devised some physial and chemical methods for separating chromite from ilmenite and then possibly the export of this

material could be guaranteed. I am not so sure. But I find in this communication the demand is made that the ban on the exports of monozite and thorium should perhaps be slackened at least as a relief measure and those who have been unemployed as a result of the closure of the Travancore Minerals Ltd, would get back their work and an important item in the working of the atomic energy department would continue.

I hope the Government would try to apply its mind to these things and do something about it.

Not so very long ago, I had an opportunity of going to the Tata Institute of Fundamental Research. It was in connection with the meeting of the Board of Archaeology. Every Member of that Board was interested in finding out how the Carbon 14 idea is worked now in the Tata Institute of Fundamental Research. I do not have any hesitation in saying that I did feel rather jealous because, I wished that in my part of the country and other parts of the country also, there were comparable institutions where such facilities were available for the conduct of fundamental research.

The Tata Memorial Hospital is now the administrative responsibility of the Atomic Energy Department and the Prime Minister's report tells us that diagnosis, treatment and research in cancer with the help of radioactive isotopes and radioactive substances is being conducted there and research is being made in order to see that cancer in the mouth and in the throat which is very widely prevalent in this country can be countered. In Calcutta, there is the Chittaranjan Cancer Hospital which, I think, has got a reasearch wing. I wish there are provisions for co-ordiating the work which is done in the Tata Memorial Hospital as well as other similar institutions in other parts of the country.

I find in the report also reference to the work of the Health Physics division. We are told that in order to ensure industrial hygiene and safety and to tackle problems of air and water pollution, the idea of radiation and its control is being pursued. I do hope that as far as our industries are concerned, the results of the work done in the Health Physics division are being made available. I am afraid that from the report, we do not get any idea of the link that there is already set up between the results achieved by the Atomic Energy department and their communication relevant interests in the country.

In Calcutta, there is the Saha Institute of Nuclear Physics. But, as the Report itself acknowledges, it does appear to be in rather a bad way for some time and the cyclotron is shut down for quite a while. It needs a good deal of looking after. I say this because the late Meghnad Saha was a Member of this House and so many of us remember him very vividly. If he was alive, I am sure he would make this Institute of Nuclear Physics a great deal more vital and dynamic than it happens to be today. Possibly Governmental encouragement goes not so much to this particular Institute because its originator is no longer there. I do wish that more is done in order to see that the Saha Institute of Nuclear Physics does not suffer from any kind of avoidable neglect.

I want to refer only to one last point and then conclude. I do so because only yesterday I got from the Indian School of International Studies Study group, which brings but a cyclostyled magazine called **Analyst,** an issue which gives a speical article on China and the Nuclear Race. It gives details of what has been done in China as far as could be found out by the writer and it refers also to the progress which China has made in this matter. From time to time we find in the papers reports which

[Shri H. N. Mukerjee]

may be very tendentious about China proposing to have a nuclear explosion in order to have the atom bomb and all that kind of thing. As far as we are concerned, the Prime Minister has explained India's policy which is that we want the utilisation of nuclear energy for peaceful purposes and while we can make a bomb if we wish to, we shall not do it. That is a very human, a very civilised and a very dignified attitude to take up. That reminds me that possibly along with that, we might pursue the concept of having an atom-free zone in our Part of the world. I remember that in the Gandhi Peace Foundation Conference, which took place some months ago, this idea was mooted by a few speakers and as far as I remember,—I may be wrong—the Prime Minister had also given his opinion to be somewhat in favour of the possibility, if that possibility could be concretised, of having an atom-free zone in regions like Africa and Asia.

Perhaps I have taken more time than I should have done because of my illiteracy in scientific matters. Even so, I have tried to say a few things which struck me as a lay student of the subject.

Dr. K. L. Rao (Vajayavada): I rise to support the Demands for Grants relating to the Department of Atomic Energy. The Department has been doing excellent work. A word of praise is due to the chairman, Dr. Bhabha, and the distinguished and talented scientists and engineers working with him.

I am venturing to make a few suggestions only for the favour of consideration. It is necessary first of all to understand the purpose and the importance of this Department to India. For a long number of centuries, man depended on the power of his muscles and that of the beasts. Then, he burnt firewood just to get the heat. Later on, about seven centuries back, he discovered coal. But, still, the power production was not greatly increased. It was only during the last one hundred years after the discovery of oil and after the discovery of the conversion of energy into electricity that he began to use power at a very tremendous rate, with the result that today the power that is being consumed all over the world has assumed very stupendous proportions. Added to that, it is one of the strange phenomena that the population for some unkown reason began to increase very tremendously only during the last three hundred years; it had remained more or less stagnant till about 1650 AD. The more the population, naturally, the more the energy which is consumed, with the result that it is now calculated that the coal, the oil and the gas will last only for about 150 to 200 years.

That is why the scientist has now gone on into this realm of atomic energy and has discovered the process of producing energy by fission. He takes uranium and thorium, and by splitting up the atoms, he produces energy which is many million times more than what he could get by the tame chemical reactions that were there when he burnt the ordinary coal. Now, it is estimated that even this kind of production of energy will not enable the energy to last for long; it may be able to last only for another three hundred or four hundred years. In order to keep civilisation on a continual track, he want on, and he is now trying to get this energy from fusion. That is, he now wants to take water, get out of it heavy hydrogen isotopes and then heat them to set them to great velocity so that the particles impinge upon one another thereby giving rise to large amounts of energy.

What I mean to say is that this science is just in its stage of infancy. It is just at that stage when by our energetic action we can catch up with the advanced Countries. It is for that purpose that look upon this Department chiefly as a pioneering body whose lot it must be to make well known this

science to India. For doing this, it is very essential that we should do everything ourselves. We should not depend on the foreigners, or on the package deals. If we indulge in package deals, if we just try to copy what others have done, then we shall not progress very far. It is very essential that we should undertake every kind of research ourselves; we should not let go any opportunity without exploiting it in the best interests of the country.

I might mention just a small example about oil discovery. Oil was first discovered by an English chemist somewhere about 1847. Then, it led to the drilling of a well, and later on, a pipe for the transport of oil followed. They first tried wood, then cast iron and then steel, and now the present development has taken place. All this has occurred more than eighty or hundred years ago. But we in India have been completely oblivious of all the developments, and today, we are running to the Italian and other firms, thinking that it is impossible for us to develop those techniques ourselves for many years. All this has happened because we have not grown along with this development. Therefore, we should not repeat that mistake in the development of this branch of atomic energy.

I will illustrate what I mean by an example. We are now trying to set up the Tarapore power station. It is a very good. But I wish that we had adopted the method of using our own uranium instead of depending on rich uranium that we have got for these stations from America. We can never in the foreseeable future think of preparing that rich uranium in India. We have to depend all the time on outside sources. Every year we have to spend Rs. 2 crores for getting rich uranium.

More than that. We will not get any experience out of this package deal. On the other hand, I would have preferred starting with a station where we can use ordinary uranium as we are trying to do in Rana Pratap Sagar and then adopt this technique of rich uranium for the second station. That is more in the order of things. I say this because our aim must be to get experience and inprove our knowledge with each development.

With regard to the selection of sites for the atomic energy stations, I am afraid we are wasting time trying to go about finding out if there is some speciality about those sites. After all, the selection of a site for an atomic energy station depends on three factors, very simple ones. First, there should be a rock, so that it may be able to stand up to the heavy weight of the reactor. The other one is availability of water for cooling purposes and the third is that it should be away from heavily built-up areas. Those considerations can be satisfied at a suitable site in any State. Therefore, what is the necessity of sending out a big team to go all round the States, creating a sort of emotion, a sort of scramble and competition among States for location of sites? I submit it is not necessary.

Take, for example, England which is a small country. It has an area of only 100,000 square miles, the area of Andhra Pradesh. At the moment, there are already 11 atomic energy stations. Therefore, whenever we want to have an atomic power station, we can decide upon the site quite easily. There is no necessity to send out a team all over the country.

Also because atomic energy production is financed by the Centre and because it has to be in the common interest of all, it is necessary that this atomic energy is shared not by a particular State alone but by all the States within a range of 300 or 400 miles, an economic distance for the transmission of power.

Mr. Speaker: The hon. Member has two minutes more.

Dr. K. L. Rao: I would like to have a few more minutes.

Shri Sham Lal Saraf: It is a highly technical subject. He has mastery over it.

Dr. K. L. Rao: The Atomic Energy Authority must have some permanent members and some temporary members. Membership must be on the basis of duties. It is no use putting some ICS officers or administrative officers. What we want is a member for engineering, a member for reactor, a member for isotopes and so on. If we do that, the scientists who are working in the department will get encouraged and will feel that they are partners in this development.

There is another aspect. No doubt it may be very costly to go in for trying to use nuclear energy in ships. Nevertheless, we should not wait till other people discover the techniques. We should in some small way carry out model experiments and gain experience in the use of nuclear energy for ship propulsion.

There is one thing more. We should not diversify or detract from out set purpose. Our set purpose is to attain the maximum knowledge in the field of atomic energy. What I mean is this. Suppose there is a power station. The Atomic Energy Authority should not divert their energies by taking up the work connected with thermal station. For suh purposes the Central Water and Power Commission is there. Those people have got experience of this work. I would definitely say that the time of the atomic Energy authority should not be wasted in drawing up specifications for boilers, erection of thermal plants and so on. This is the practice all over the world. It is necessary to follow it in this country as well. The Atomic Energy Department can be consultants to the power energies on nuclear fuel aspects.

This department also deals with space research. It would have been better if there were two sections in the Report one dealing with nuclear energy and the other devoted to space research. Space research is an entirely different field. It would have been better if it had been the responsibility of a separate department or separate authority itself, because it has assumed very great importance in the modern world.

We should not mix up this and that. I am anxious that our entire energy must be devoted to the development of atomic energy, which is most essential for the survival in the community of nations.

17 hrs.

Both space research and atomic research are subjects which are very fascinating, no doubt, but they are very difficult to understand. Therefore, very simple and popular books are very essential. It is always the rule that these books are best written only by the speialists. I would, therefore, submit that the Publications Section of the Atomic Energy Department can put out some of these books suitable for various types of people, and permeate the entire nation with knowledge of atomic energy, what it means, how it is of use, etc. The whole nation must get into that spirit.

Lastly, I would only submit that in so far as we have got very little money for a very vital subject like this, on which several crores are spent by foreign countries, we must spread it out, we must achieve the utmost economy by putting up simple buildings, by eliminating as far as possible non-technical and non-productive staff, and by adopting well-proved techniques in the present phase of our development.

श्री बड़े : अध्यक्ष महोदय, यह एटामिक ईनरजी का विषय बहुत महत्व का है और यह बहुत टैकनिकल भी है। आज जिस में हम रह रहे हैं इस को एटामिक युग कहा जाता है। आज इस युग में रूस और अमरीका दोनों ही आणविक अस्त्रों से सज्जित हैं। पर हमारा उद्देश्य इस युग में एटामिक

इनरजी को केवल पीसफुल परपजेज के लिए इस्तैमाल करना है जैसा कि हाल में प्रधान मंत्री जी ने रोहतक में कहा था । मुझे इस के बारे में कुछ कहना है ।

हमारे देश में चार पांच अच्छे अच्छे साइंटिस्ट हैं । और हम को गर्व है कि डा० भावा जैसे साइंटिस्ट भारत वर्ष में हैं । उन्हों ने जो शोध कार्य किया है उसके लिए मैं उन का अभिनन्दन करता हूं । यह बात सुन कर जनता को बड़ी प्रसन्नता है कि हम साउंडिंग राकेट छोड़ने वाले हैं । यह देख कर हम को प्रसन्नता होती है कि एटामिक इनरजी के क्षत्र में हम प्रगति कर रहे हैं । एटामिक इनरजी केंसर के इलाज के उपयोग में आ रही है और मनुष्य शरीर के वास्ते उस का प्रयोग हो रहा है । केन्सर के लिए चित्तरंजन केंसर अस्पताल खुला है जिस में एटामिक इनरजी से इलाज होता है । यह बड़ी प्रसन्नता की बात है ।

जब चीन ने हमारे ऊपर आक्रमण किया उस समय रूस ने कुछ मिसाइल्स उसके पास भेज दिए थे । पता नहीं कि चाइना के पास एटामिक वैपन्स हैं या नहीं । प्राइम मिनिस्टर साहब ने कहा है कि उस के पास नहीं है, क्योंकि अगर उस के पास होते तो वह उन का प्रयोग करता मैं समझता हूं कि इस स्थिति में अपने यहां भी हम को एटामिक वैपन्स का निर्माण करना पीसफुल परपज मानना चाहिये । हम उनका निर्माण अटैक के लिए नहीं पर आत्म-रक्षा के लिए करें ।

शरीर मात्रम् खलु धर्म साधनम्

देश की रक्षा के लिए जो साधन हमारे पास हैं उनका प्रयोग करना चाहिए इस बात को एक आदिवासी भी सही समझता है । मेरा विचार है कि हमारे देश में जो अग्रगण्य माने जाते हैं, हमारे प्रधान मंत्री जी, उनको भी अपने इस सिद्धान्त से हटना होगा कि हम एटामिक वैपन्स नहीं बानएंगे । मैं पूछता हूं कि यदि चीन ने हमारे ऊपर एटामिक वैपन्स से हमला कर दिया तो क्या उस वक्त हम रूस से या अमरीका से कहेंगे कि हमारी मदद करो । जिस प्रकार आप दूसरे माडर्न वैपन्स का निर्माण कर रहे हैं, जैसे आप ओटोमैटिक वैपन्स का निर्माण कर रहे हैं उसी प्रकार एटामिक ऐनरजी की रिसर्च का लाभ उठा कर हम को एटामिक वैपन्स का भी निर्माण करना चाहिए ।

हमारे प्रधान मंत्री जी ने कहा कि हम चाहें तो आज एटामिक वैपन्स का निर्माण कर सकते हैं लेकिन हम करेंगे नहीं । हमारे प्राइम मिनिस्टर साहब की नान एलाइनमेंट के सिद्धान्त में भी आस्था थी लेकिन परिस्थिति के अनुसार उनको उस नीति को मोड़ना पड़ा और नानवायलेंस की नीति होते हुए भी हमको अपनी रक्षा करने के लिए लड़ाई लड़नी पड़ी है । जिस प्रकार सर्वोदय वाले अपनी शान्ति सेना ले कर जाते हैं, अगर उस तरह हम चीन के सामने शान्ति सेना ले कर जाते तो वह नष्ट हो जाती । वहां शान्ति सेना से काम नहीं चल सकता । चीनी तो कहते हैं—पविर मीन्स वार । उनका विचार है कि सावरेनटी पावर से हो सकती है । जब हम एटामिक वैपन्स तैयार कर सकते हैं तो क्यों न डिफेंस के लिए उनका निर्माण करें, और ऐसा करने को एटामिक इनरजी का पीसफुल परपज के लिए उपयोग मानें ।

इस के साथ साथ मैं यह कहता हूं कि आज यह माना जाता है कि यू० एन० ओ० के कारण संसार में शान्ति स्थापित है । लेकिन मेरा खयाल है कि अगर अमरीका हिरोशिमा पर एटम बम न डालता तो इतनी जल्दी दुनिया में शान्ति न आती और हिटलर का अन्त न होता । यह जो शान्ति स्थापित हुई है यह अमरीका द्वारा जापान पर एटम बम डालने से हुई है । यदि यह

[श्री बड़े]

सत्य है तो आज हिन्दुस्तान को विचार करना चाहिए और प्रधान मंत्री साहब को विचार करना चाहिए कि हमको अपनी रक्षा के लिए एटामिक वैपन्स का निर्माण करना चाहिए, क्योंकि सम्भव है कि चीन के पास ऐसे वैपन्स हों । हमको डा० भाभा को इस काम में लगाना चाहिए और इस काम को एटामिक इनरजी का पीसफुल परपज के लिए इस्तेमाल मानना चाहिए ।

हमारे यहां कुछ लोग हैं जो चाहते हैं कि यहां चीन राज्य करे या रूस राज करे । ऐसे लोग कभी नहीं कहेंगे कि हमको एटामिक वैपन्स बनाने चाहिए । वह तो इस बात की प्रशंसा करेंगे कि हमारा उद्देश्य एटामिक वैपन्स बनाना नहीं है । वे लोग तो जानते हैं कि यहां चीन का राज होगा तो तो अपने भाई का राज्य होगा, रूस का यहां राज्य होगा तो अपने भाई का होगा । लेकिन जो हम लोग भारतीय संस्कृति को लेकर चलने वाले हैं और जो चाहते हैं कि देश में डिमोक्रेसी रहनी चाहिए उनका यही कहना है कि हमको केवल अपने डिफेंस के वास्ते एटामिक वैपन्स का निर्माण करना होगा । इसी कारण मैं कहता हूं कि इस के लिए बजट बहुत कम रखा गया है और समय भी कम दिया गया है । इस बारे में शुक्रवार को मेरा प्रस्ताव भी आने वाला है कि हमको डिफेंस के लिए एटामिक वैपन्स बनाने चाहिए और उसको एटामिक इनरजी का पीसफुल परपज के लिए इस्तेमाल मानना चाहिए ।

मेरी प्रधान मंत्री जी से विनती है कि हमारे यहां जो एटामिक रिसर्च में इतनी उन्नति हो गयी है उसका लाभ हमको उठाना चाहिए, और जैसा कि उन्हों ने कहा था कि हम चाहें तो एटामिक वैपन बना सकते हैं, तो हमें चाहना से अपनी रक्षा के लिए एटामिक वैपन अवश्य बनाना चाहिए । यही मेरी उन से विनती है ।

Shri Vidya Charan Shukla (Mahasamund): Mr. Speaker, Sir, I rise to support the demands in the Department of Atomic Energy. My predecessor referred to the controversy whether we should start manufacture of atom bomb in our country or not. We do not take Members of the Jan Sangh seriously in these matters because I do not think they have given any due or serious thought to this problem before giving an opinion on whether India should also join the nuclear race in the world. I am sure that all the right thinking people in the country will feel that it is a very wise and right decision not to make atom bomb in our country even though technically we are absolutely capable of making it. Apart from the tremendous amount of money that would be needed in manufacturing them it would not be of any practical utility. We have seen nuclear power attacking non-nuclear powers and getting the worse of it. Such was the case when UK and France attacked UAR. They could not use their atom bombs; they had to retreat. This is a small example. In other circumstances, too, atom bomb is not finally deciding things. The larger question of humanity is also there. The Jan Sangh Member probably did not know that making atom bomb means carrying out tests, a series of tests to make the bombs more perfect. We do not have any colonies anywhere to test and we will have to do it right on our own soil. There are several other complicated problems. Any reasonable man giving any thought to this matter will come to the conclusion to which the Government of India has come, namely that it is not in our interest to indulge in the manufacture of nuclear bombs in our country.

Sometime back, there was a controversy about the development of nuclear power in our country. It was said by many experts, many power experts, that nuclear power being very costly, it is a luxury for us. It may be costly. It is not yet

certain whether it is costly or not, compared to hydel or thermal power resources. Even if it is costly, it is essential that we keep in touch with the development of nuclear power production so that in the coming decades, when it will become the main source of supply for all production of energy, we shall not be lagging behind in the knowledge of this vital matter.

There is a very nice paper, a very well-argued paper, that has been put out by Dr. Bhabha—*Atomic Energy in Indian Economy*. It is a very well-argued paper, and it has pointed out many factors which make it doubtful whether thermal or hydel power production is cheaper than the production of atomic power. Again, Shri Gopala Ayyangar has also written a beautiful article entitled *Capital coefficients for some power schemes in India*. That also deals in effeect with the same subject. It is a very disquieting feature that the Central Water and Power Commission has come out with another paper which controverts or denies certain things which have been said by the Atomic Energy Commission. It sought to prove that what has been said by the Atomic Energy Commission is not true or is not correct. I personally feel that two Commissions of the same Government should not enter into a public controversy of this nature and try to disprove what each other is saying about these matters.

Another important activity that has been taken up by the Atomic Energy Department is the space research programme. I compliment the department for undertaking this, and although we have made a very modest start, we have started very well, and I am sure we will press on with it, so that we can keep in touch with the latest developments in this regard; particularly, this project known as the project Satellite Communications which is being established in our country is extremely important for a country like ours, where the communication facilities are yet far from perfect. This will not only enable us to communicate to each other efficiently from one part to another part, but will also aid international communication. It will be extremely important and it will bring India closer to many friendly countries all over the world.

Then, this international equatorial sounding rocket launching facility which is being set up in our country also points to the fact that we have taken up the space programme seriously, and we want to develop it so that our country could also benefit from the advancement of these things.

We have a fairly rich source of atomic minerals in our country. Apart from fulfilling our needs, we can also develop big export trade of these atomic minerals, particularly to such countries as have declared and which have said that they are devoted to peaceful use of atomic energy. We have been exporting some ilmenite to other countries, but I am sorry to say that the export of ilmenite has recently fallen very badly. It is said that the Government of India are making efforts to recapture the lost market, and are trying their best to see that the export of ilmenite is again increased. I am sure this could be done if this matter is properly handed in a commercial manner. I am afraid this was not handled in a commercial manner before.

There is one point about the power house. It is not clear whether the American company which is advising us in setting up this power station at Tarapore has taken the complete responsibility about the performance; if they have taken the complete responsibility about the performance, when the station is to come, and whether they have also bound this item with a guarantee clause, with a penalty incorported in it—that in case the station does not give the performance as stated in the project report, then, whether they would be liable to pay any penalty on that.

[Shri Vidya Charan Shukla]

I am glad that the second atomic power station at Rana Pratap Sagar is being put up by our own technicians, engineers and scientists. The scheme is being given by a foreign collaborator. Here also I would request the Government to see that the people who are supplying this scheme are bound down to certain agreements, which will enable us to recover penalty from them, which is very unlikely, if this does not come up well.

Shri Surendranath Dwivedy: Sir, we are proud of the achievements and the devotion with which the scientists, both young and old, in the Atomic Energy Commission work. I take this opportunity again to point out certain matters, which I had the privilege to raise in this House on a previous occasion, i.e. regarding the organisation of the Commission.

We are also happy that we have at the head of this organisation. That such a reputed scientist as Dr. Bhabha gives it an international prestige. At the same time, I think the time has come when the Government should seriously think whether top scientists, who ought to devote more time to supervise and give advice to the workers regarding research, survey, etc. in different parts of the country under the auspices of this Commission, would devote their entire time to this or they should be saddled with the responsibility of administration of this Commission. As it is found, Dr. Bhabha has very great responsibility to discharge in other parts of the world also. Hardly he gets time to look to research work I do not know; I will be happy if I am told if he has also had occasions to go to the actual field to see what are the practical difficulties faced by the young scientists who are taking up this work in mountainous terrain and how he is going to solve them. Probably it has not been possible for him to go, on account of the fact that the time he can afford is mainly concerned with the administrative aspects of it.

I will give one example. On the last occasion, I raised the question of the appointment of a Director for the Atomic Minerals Division here in Delhi. Dr. Ghosh was a very renowned person and it has to be admitted that when Dr. Ghosh was the Director the work of this division expanded like anything. The scientists working under this division were very happy because he was paying particular attention to the problems of the scientists who are working in very difficult regions. But some years have passed and still the Government have not been able to appoint a whole-time Director. I have nothing to say against the present Geological Adviser who has been entrusted with the task. But he has also certain other duties to attend to and I do not think that such an important post should remain vacant. Am I to understand that in this country, there is no sufficient talent to come forward to be appointed as Director of this division? These are things which I think ought to receive immediate attention.

I feel that not only in the Atomic Energy Commission, but in other departments too, efforts should be made to see that there is division of work so far as scientists and administrators are concerned. I do not say that there should be parallel departments, but there should be co-ordination. Overall charge must be of the scientists, but the administrative aspect of it must be entrusted to persons who devote more time, rather the entire time, for this type of work. Sir, regarding manufacture of atom bomb, I do not accept this view. I fully agree that this country should stick to its policy of not manufacturing nuclear bombs or atom bombs, come what may. At least the peace voice of India must not be a pray to the mad race. We are very clear on this. Of course, in the context of the

present situation, the present emergency and the Chinese aggression, I do not know what the thinking of the Government is. Do they contemplate taking assistance from other countries when situation demands. Even then I am not of the opinion that we should also manufacture or use nuclear bombs against our enemy, whoever he may be.

But what I want to know is, if that is our fixed policy, then why are we creating the capacity to manufacture these bombs? What happens to the investment that we are making? If we have taken it as a principle that we would never manufacture atomic bombs, what is the necessity of creating the capacity and taking money for this purpose? If we are really having any machinery for this purpose, that should be devoted entirely for other beneficial use in this country which has been indicated by many hon. Members. I want to be clarified in this matter as to whether this capacity that we are creating for manufacture of atom bombs would also give us sufficient facility to look to the other aspect of utilisation of the atomic energy, to the beneficial use of atomic power.

Then, about this report I want to say one or two things. I do not think the report is very satisfactory as it has been presented to us. I find that on page 13 details are lacking about some areas where investigations are going on—areas like Punjab, Bihar and Uttar Pradesh. I think that on future occasions the actual achievements in these areas should be given in the reports. On the same page it is said:

> "Prospecting in the Umra and Udaisagar areas of Rajasthan, however, has been discontinued due to lack of reserves."

The prospecting in these areas was started a few years back. When did the Department come to know that there was lack of reserves? Could it not have been stopped two years back or even before that when they got the information that there was lack of reserves? Why was it carried on till now, and at what cost? I also find that there is mention about a separate project for the Jaduguda Mines. Was it necessary to have a separate mining project for this? Was this Atomic Minerals Division not capable to carry out the work of this project also?

When I am speaking about this Department, I would like to ask one thing. The Prime Minister gave me a reply on 19th August, 1961, when we discussed this matter in this House on the annual report, about the pay, facilities and other emoluments given to the scientists who are working under this division. He said that taking the recommendations of the Pay Commission, although no special mention was made there about scientists as such, and taking all other factors into consideration, some decision would be taken very soon and retrospective effect would be given regarding special pay and other things. I want to know whether that has been done.

Lastly, I only want to impress that there should not be any occasion for grievances that scientists are not getting proper opportunities to work in the departments which they have chosen to work in, because at least this is one of the departments where we should create conditions in which a scientist who once chooses a department should feel assured of his services, of his future prospects and he may not have the temptation, for reasons other than the work that he has undertaken, to go to other departments in search of other opportunities.

Shri V. B. Gandhi (Bombay Central South): Mr. Speaker, we have before us this Report of the Atomic Energy Department, which tells us a

[Shri V. B. Gandhi]

story of heartening all-round progress in the expansion of research and development in atomic energy. We in India have three reactors, Apsara, Zerlina and their big brother CIR. All of them have been operating satisfactorily, at power levels, appropriate to their capacity. I shall not spend more time on this part of the report, but shall proceed directly to consider something which is of more immediate importance to us, and that is the development of atomic power stations in this country.

In the report we have a fairly detailed account of the steps that have led to the acceptance, or approval I should say, of the tender of the International General Electric Company for the establishment of a power station at Tarapore. Of course, some things have still to be settled, negotiations have still to be completed with the US Government with regard to several important matters such as arrangements for financing, fuel supply, safeguards and allied matters.

We are glad to know that the power that will be supplied by the Tarapore power station will be available at an economic rate of 3.25 nP per k.w.h. That compares very favourably with the cost of conventional thermal power. Besides, we in this region of Maharashtra and Gujarat, and for that matter many other regions in this country, have not much to choose. We are all power-hungry regions, and we also know that power stations are not so easy to get; they are not sold in a shop round the corner. A lot of work has to be done before a power station can be a reality.

The Tarapore power station is a kind of, what they call, a turn-key contract station. In other words, it would mean that GEC will handle the job more or less completely, that there will be little opportunity or not much opportunity for Indian scientists and engineers to participate. However, there is going to be another power station in Rajasthan, which has been planned and where some progress has been made. In the case of this power station in Rajasthan there is a fundamental difference, and that difference lies in the fact that here in the Rajasthan project, which will be our second power station, there will be greater interest for us, because this station will be built by Indian scientists and engineers themselves. Only the designs would be obtained from Canada. We are all very proud of the fact that this new station is being undertaken. It is not going to be a small station either. It is going to have a capacity initially of 200 megawatts with a provision for doubling that capacity if required.

We have to be very careful of our steps from here on. We have seen that very often the response to the needs of the Atomic Energy Department from authorities who control finance is not of the kind that would help. I would like that whether on account of negotiations for finance with the Canadian friends or negotiations connected with provision of safeguards and other allied matters, it should be seen that this fundamental feature which is inherent in the second project for Rajasthan, that is, that there will be greater initiative, greater participation for our scientists and engineers in completing the job with greater independence for them at all levels, should be preserved. If, for any reason, Government finds that there are difficulties in getting the Canadian friends to agree to finance on reasonable terms or to accept safeguards which are reasonable, I think, the need for a second power project in Rajasthan is so vital, so immediate and urgent and also the need for our scientists and engineers to learn the trade is so very important that I hope the Government will not allow considerations of finance to come in the way. I say this because I know things of this kind have happened even in instances of lesser importance.

I am informed that in the case of the uranium mill at Jaduguda difficulties are being experienced. I do not think here the finance involved is of any very large proportion but the response from those who are supposed to release foreign exchange for such important projects is not of the kind that would be helpful. The work of the uranium mill is likely to be held up for delays in finance being available. Here in this uranium mill we know, have something which is a link in the chain that leads to the production of plutonium as the final product and we all know enough by this time to realise and appreciate the importance of plutonium in our future. It is an indispensable matter for our future. It is wrong to hold up progress for want of foreign exchange release to the department at any time and it is dangerous to do so at such a critical time.

Dr. Gaitonde (Goa, Daman and Diu): Mr. Speaker, Sir, most of the hon. Members who have spoken before me have praised the work of the Atomic Energy Commission and Dr. Bhabha. Now, it is about six years that the Atomic Energy Commission succeeded in putting the reactor in action and during these six year the development is so good, so big, that, of course, anybody would praise it. I myself had an opportunity of participating in the same conference where two of the scientists of the Atomic Energy Commission participated and I could easily see their worth, their brilliance and their originality.

This does not mean that the report that has been presented to us is absolutely perfect. It is not. For example, I would draw your attention to one point which is very important for me and that is as regards the Tata Memorial Hospital. I really do not understand the link between the Tata Memorial Hospital and the Atomic Energy Commission. The Tata Memorial Hospital is only for cancer. The reason that is being given here is that the treatment and research in cancer and other diseases is done with the help of radioactive isotopes and other radioactive substances. This is done everywhere in the world. It is nothing new. Today, it is a routine practice. Everywhere in the world, in every good hospital the radioactive isotopes and readioactive substances are being used. That cannot be a reason, for the Tata Memorial Hospital to belong to the Atomic Energy Commission. That is not very logical.

Another thing to which I would like to draw the attention of the Members and also of the Commission is that—if you read it, you may laugh—this Commission also produces contraceptives. Now, there is nothing wrong in producing contraceptives. But it does not read well in this report. What I really feel is, apart from this linking of the Tata Memorial Hospital with the Atomic Energy Commission, the function of which is completely different from the function of the Atomic Energy Commission—excluding this part—I am in complete agreement with whatever is stated in this report.

There are, chiefly, two important aspects of the report according to me. The first is the atomic power station and the second is the space research. I think the Communist Member referred to the natural resources saying that they are important. Of course, natural resources are important. But, I believe, it was Dr. Bhabha who once said that our position today is of the dung power era and I do believe that this is really the case in India. If you ask any scientist anywhere in the world as to which power should be used in under-developed countries, all of them will say that the power that should be used is atomic power. There are two reasons for it The first reason is that we in Asia do not have fossil fuel in the same quantity as it is available in Europe or in the United States. I believe—I hope the Atomic Energy Commission will correct me if I am wrong—that it is about one-tenth of the fossil fuel available in

[Dr. Gaitonde]

Europe and less than 1|50th that of U.S.A. That is the strength of Asia. This means that even if we wanted to use natural resources, we will always be behind other countries. That, naturally, we cannot afford.

Secondly, we have to take a jump as far as power is concerned, in the sense that, today, the critteion, the yardstick that measures the development of any country is the per capita consumption of electricity, or energy in general. I believe, in Asia our consumption is about 1/100th of the consumption of developed countries like the U.S.A. or Europe. In these circumstances, naturally, the only thing that remains is, instead of having coal, you have atomic power, which will last for a long time. Therefore, I support the grants for the Atomic Energy Commission. The second point is about space research. I do not know anything about space research. But, I feel that is one of the most important lines for our future work.

Now, I come to a point which is very dear to me, and that is the monazite sands of Kerala. About 5 years ago, I believe, Shri Gopala Ayyangar read a paper in the International Conference as regards monazite sands. I believe he said that radio activity there was between 5 to 20 Roentgen for 30 years of reproductive life. This is very high. He also suggested some work that could be done in this respect. This report does not say much about this work. The only thing that has been said is that they are doing work. What type of work is not known.

Secondly, I would like to call the attention of the Commission to the observation by some doctors that certain types of diseases are more prevelent in Kerala in that zone. That zone has got a population of 1 lakh. These diseases, I think, should be taken into consideration while studying the problem of the action of radio activity on heredity and other things. This report also refers to an unexpected thing. That is, that the sands in Goa seem to contain some heavy elements. If they are radio-active, some care will have to be taken to study them and their effects.

I come to the general question of policy. Of course, today, I do not believe there will be any scientist in the world who will say that we should make an atom bomb. The scientists who made the bomb had their fears and hopes. Yet, their fears have come true; but only some of their hopes, not all of them, have come true. All of them have always been against explosion. Therefore, more attention has been concentrated on peaceful uses. Up till recently, we knew exactly what is the meaning of peaceful uses. We used to say there are only two types: first through radio-activity and second through power. I came across a very interesting project. Certainly, the Atomic Energy Commission knows about this project—Gnome project of the U.S.A. In 1961, a few days before the action in Goa, the project was put into execution. President Kennedy said on October 25th, about this project that it was a further example of this country's desire to turn atomic power to men's welfare rather than to destruction. What is this project? The project is,—I will read it out from page 208 of the book, *Major activities in the Atomic Energy Programs*—January-December 1961, published in January, 1962.

It says as follows:

> "The Commission's Plowshare programme is directed toward demonstrating that nuclear explosives can be used for a variety of peaceful industrial, scientific, and civilian uses such as excavation projects, the tapping of water and mineral resources, and possible heat reservoirs."

I do not know what the policy the Government of India is in this res-

pect, whether this explosion will be considered as a peaceful or not as a peaceful use. I think that some thought should be given to this.

Another thing that I have seen in this report is that there is no mention of accidents. I really do not understand why they have only said that they are taking preventive measures against the accidents. But, are we to believe that there has been no accident in the Atomic Energy Commission where hundreds of workers are working? In other countries, accidents do occur. Of course, they are not of the nature that the Commission appointed by the American Atomic Energy Commission had pointed out. Some years ago, there was a commission consisting of a group of experts on the possible consequences of a bad reactor accident, and the report was known as 'Wash-740'. And they believed that if there is an accident there will be thousands of casualities and thousands of millions of dollars worth of damage. This accident is of a type when you lose control of it.

Up till now there have been only 20 occasions when a reactor went out of control, and where there were only six deaths and a loss of a few hundred thousand dollars. This is all over the world taking all the atomic plants into consideration. But then, those are the major things. But there are always minor accidents, and the country should naturally know what type of accidents take place. The report referred to earlier gives all the accidents and also mentions what is being done about them in the United States. So, I would like to suggest that it would be a good idea for the Atomic Energy Commission to give in the next report an idea of some aspects of this problem.

I think that it was Dr. K. L. Rao who referred to how much power was being used in England It is good for us to know what other countries are doing. Otherwise, we would be always behind the times. The atonic power plants in England today give about 575 M.W. of energy, and within a few years, that is, by the end of 1968, they will be able to give 4500 M.W., while the atomic energy power plant that we are going to establish will give only about 380 M.W. So, I feel that all of us should encourage those plants, and we should have not only one but as many as possible taking into consideration the size of our population and the time-lag in the development between us and the highly developed countries.

I shall now come to isotopes. I am very glad that we are now producing our own isotopes for our purposes. Till very recently, that is up to four years ago, we had to import isotopes either from the U.S. or from England. Today we do not need to do it. This is one of those things which the scientists India have been able to produce. We should be extremely happy over this, that the work that is being doen in the Commission is producing very good results.

I will conclude by saying a few words about what happened when the first reaction took place about 20 years and a few months ago. They celebrated the 2nd of December last as the 20th anniversry of the first reaction. The House will be surprised to know that on the 2nd of December 1942, when the first self-sustaining action took place, they celebrated it in the following way. A bottle was opened. It was a bottle of Chianti which is a type of wine. One of the scientists opened it. It was distributed to all the scientists in paper cups. Toady, after 20 years, that bottle of Chianti is as well known as the reactor itself.

For the first time in August 1956, Dr. Bhabha brought about this reaction in Trombay. I do not know whether he had any Chianti....

The Deputy Minister in the Ministry of External Affairs (Shri Dinesh Singh): There is prohibition in Bombay.

Dr. Gaitonde: He might have distributed some neera to his friends.

Mr. Speaker: Some doctor couid supply him.

Dr. Gaitonde: This is only to show the difference between the way we celebrate and the way they celebrate.

Now that we are in an emergency, I feel that we should attach much more importance to the problem of atomic energy because of the power that we need.

Shri Shivaji Rao S. Deshmukh (Parbhani): I thank you for giving me this opportunity to participate in this most important debate on the Demands for Grans of the Department of Atomic Energy. Though the Atomic Energy Department was started very late in the fifties, I think it has progressed so much that it deserves our congratulations. I therefore support the Demands for Grants.

Our Atomic Energy Commission has the distinction of being presided over by Dr. H. J. Bhabha whose technical talents and eminence in atomic science are unchallenged and universally acknowledged. Particularly in a poor country like India with a backward economy, which wants to develop at a pace sufficient enough to raise the standard of living of the masses, atomic energy constitutes the ultimate hope, and I should say, the only hope, for economic progress.

I remember to have read somewhere that according to an international survey conducted by some authorities, the known power resources of the world were divided into 40 abstract units. Out of these, the United States was supposed to possess 12 and India only half. But now, because of the revolution that has occurred in the power environments, because of the possibility of using atomic energy, the known power resources of the world is placed at 400 abstract units out of which India is supposed to possess more than 220 units. So, the tremendous possibilities that atomic energy can have for India can scarcely be over-estimated. But with the speed with which our Atomic Energy Commission moves forward, I think it is futile to expect any revolutionary changes in the power pattern of India as a whole.

I belong to that State which stands to benefit by the establishment of the Tarapur atomic power station. I was glad to hear that the cost of the station, as a result of a change in the design, has been considerably lowered, and that it now favourably compares with the cost of conventional power stations. But I have a grouse against this change in design. The atomic base mineral on which this station will be based will have to be totally imported from U.K. I think in the vital aspect of atomic power, to be totally dependant on even a friendly country like U.K. will mean taking a risk, which the nation cannot afford at this stage. I would have been happy if we had proceeded with the Calder Hall type of station which we had in mind for establishment at Tarapur, which had the benefit of being based on Indian atomic ores. This sudden change, with the intention of achieving economy in the establishment of the Tarapur power station, has placed certain thinking pepole in Maharashtra in a quandary as to their perpetual dependance on foreign supply for atomic fuel. I think the authorities in the Commission will take due note of this, and see to it that within a reasonable space of time the atomic fuel required is indigenously produced. On this basis I wish to congratulate the Atomic Energy Commission for their design of the Rana Pratap Sagar power station, which they say will be of the Candu type, and will utilise Indian ores. Thefore, I think the setting up of a heavy water plant and the processing of our atomic ores to suit the Candu type of design is a step in the right direction and has come at the right moment.

Further, as has been stated by my hon. friend Dr. Gaitonde, the role of the Atomic Energy Commission in the

Tata Institute of Fundamental Research and Hopkins Institute is commendable, but their link with the Tata Memorial Hospital leaves much to comment upon. I think the Tata Memorial Hospital should not be singled out for favoured treatment at the hands of the atomic energy establishment.

We are fortunate enough to have only three atomic reactors. We started with Apsara, we then proceeded to establish the Canada-India reactor, and now we have the Zerlina, our own reactor. But this number of three reactors for a vast country like India sounds ridiculous, against the total number of 300 reactors of such type in the world. I think something should be done to see to it that India assumes its place in the field of the development of atomic research.

18 hrs.

India has got the distinction of having Dr. Bose, who is now acknowledged to be the originator of nuclear physics. He was the first scientist who said that if a thin film of hydrogen were subjected to bombardment by ultra particles, it gives the particles a charge. He was the first scientist who propounded the theory that atoms are charged, which ultimately led to the division of the atom. Therefore, the nation which has laid the foundation of nuclear physics, the nation which for the first time raised the possibilities of dividing the atom, the nation which has now got 220 abstract units of power on the revolutionised pattern of power which the world proposes to have, should have some more important and eminent place in the entire devlopment of atomic research, and I think with the co-operation of Dr. Bhabha, and with his eminence, we shall progress satisfactorily, if the House agrees to meet the Demands for Grants which ought to be on a much greater scale than today. Now, we are claiming that we are leading the world in peaceful uses of atomic energy. We forget one fundamental fact that UK which does not profess to lead the world in this field of peaceful uses of atomic energy is working on a reactor which will be suitably placed on the locomotive. In a nation whose principal cities are divided by thousands of miles, where electric traction possibility or deiselisation possibilities are next to nothing deiselisation requires setting up of huge reservoirs and an elaborate delivery system—it is not late in the day now to think of having reactors on the Indian locos. I think it is not difficult to work on these lines. I do not suppose that our atomic scientists will lag behind. The world has progressed to such an extent that people are thinking of having one atomic mechanism which will give unlimited supply of fuel to the motor car. No one in this House desires India to have a nuclear or atomic bomb. But we are equally serious that our Atomic Energy Commission would move in this direction to see that India really leads in the peaceful uses of atomic energy. We have seen atomic particles and tracers used in locating silts, sands, etc. There are unlimited possibilities like that. It may be that in a nation of illiterate people who are, according to our Prime Minister, in the cow dung age, we may lag behind in atomic age. When we have bright prospects of development of atomic science, we can look upon the Atomic Energy Commission to lead the nation in peaceful uses of atomic energy and to see that India gets its own place in the peaceful uses of atomic energy. We propose to put up at Mahabalipuram a design totally constructed by our own scientists. Our scientists deserve our congratulations. Shall I continue on Monday?

Mr. Speaker No; he should finish today.

Shri Shivaji Rao S. Deshmukh: I think our scientists deserve the congratulations for being successful in fabricating and constructing 200 MW atomic reactors. Our progress in Tarapore project leaves much room to

[Shri Shivaji Rao S. Deshmukh]

be desired; we hope that it would be expedited.

Shri Bade: He may continue on Monday, Sir.

Mr. Speaker: No, I am concluding the debate today with him.

Shri Shivaji Rao S. Deshmukh: I will require five more minutes.

Mr. Speaker: He will have two or three minutes.

Shri Shivaji Rao S. Deshmukh: Within five minutes I will close.

The sudden change in the Tarapore design does not allow the Tarapore station to progress according to schedule. So, we lag behind and I think we will be successful in meeting this lagging behind. When it is finished it will add considerably to the power potential in Maharashtra and Bombay. It seems to me that this rosy picture of an atomic energy power station being located at Tarapore which will be in a position to meet to a considerable extent the requirements of power hungry regions of Bombay and Maharashtra should not be looked upon from this point of view as being a ground to refuse the other conventional sources of power. I refer particularly to electricity which is a scarce commodity in this region. Because of this, the people of Maharashtra look to Tarapore as a symbol of their future progress and they wish that nothing should be done that would ultimately retard or lead to a slow process of establishment of the power station at Tarapore.

I wish that the Atomic Energy Commission and the authorities concerned see to it that the fabrication of future atomic fuels at Tarapore would be completely in Indian hands and that it will be processed out of the Atomic fuels which are at the disposal of India. I hope it will ultimately, and successfully lead Tarapore to complete self-sufficiency in this sole and vital respect of atomic fuel.

There is nothing more to be said about our future atomic stations at Rana Pratap Sagar and Mahabalipuram. I only congratulate our engineers and our scientists in the Atomic Energy Commission who have shown remarkably that atomic energy can be the third largest source of power in India, not in the distant future but in the fourth Five Year Plan period. I think further investigations should be undertaken at the techno-economic level for suitable sites for the selection of atomic energy power stations.

Further, I shall make one point clear. I wish that the Prime Minister will be in a position to make an authoritative statement on this. There is much unrest and there are doubts in the minds of people because of the alleged news of nuclear explosion by China somewhere in Tibet. We were informed in this House that we have got our own atomic detector at Gangtok. But our scientists are not in a position to state on the basis of any increase in radio-activity, whether there had been any nuclear explosion in Tibet. I think it devolves upon the authorities in the Atomic Energy establishment that they owe this as their fundamental duty to this nation, to be in a position to scientifically locate the possible sites of nuclear explosions or to state definitely that there had not been any such nuclear explosion in Tibet or Sinkiang by China. In the light of the strained relations between India and China, everyone is concerned about the atomic development in China. When we say that India does not lag behind China in atomic development, it is reasonable to expect that every Member of this House should be in a position to know definitely how far China has progressed and where she exactly stands. When we say that because of nuclear explosions that were

undertaken by French people in the Sahara there have been dangerous possibilities of nuclear radiation, I think that the same possibilities may be there on our own territory because of the alleged explosion of nuclear bomb by China.

I would refer to one last point before I finish. We and our doctors in this nation are faced with a hazard of being exposed to considerable dozes of radiation, particularly those working in the TB sanatoria. The doctors especially have to examine with naked eye hundreds of patients. I think due regard should be paid by the Atomic Energy establishment to define carefully radiation hazards which the doctors' eyes will be subject to. They are all protected by aprons, but the eyes are the portions which are exposed. I have been informed that the eyes are the portions which are least affected by radiation. Even then, the hazards of radiation are there. Therefore, there should be a definite statement as to the level of radiation which the human eye can sustain. Care should be taken to see that our doctors do not suffer because of radiation hazards for the most humane service they render to the people. In this respect also, our Atomic Energy Commission should guide their energies.

I once again congratulate the Commission on the success they have achieved. I hope their success in future will be on a much grander and bigger scale, and what they are trying to do will ultimately succeed in developing the Tarapore power station according to schedule. With these words, I resume my seat.

Mr. Speaker: The Prime Minister will reply to the debate on Monday. The debate is otherwise concluded.

18.10 hrs.

The Lok Sabha then adjourned till Eleven of the Clock on Monday, March 25, 1963/Chaitra 4, 1884 (Saka).