One is the demand for a Free Trade Zone like you are having in Kandla in Gujarat or Bombay. It should be located at Meenambakkam near Madras in Tamil Nadu for which site has been offered. I would request the Government to come forward to have it there immediately.

The other point is we have written a letter to the Education Minister and the Prime Minister about the renovation of the famous Jalakantheswar temple in Vellore, in which the idol which was not there for nearly 300 years, has been reinstalled there. There is a problem between the Archaeological Department and the Government as to the temple. We have already written to the Government and the State Government is prepared to take over the temple and maintain it and renovate it. I hope the Government will come forward to solve this problem immediately.

Finally, at this juncture, I do not want to create more controversy. But the TV and AIR programmes are not being oriented in any manner to be favourable to the State Government. We want it to be objective. We do not want anything else. They should cover the various rural development programmes that are being undertaken by the State. Also I feel that the AIR should cover the local legislature proceedings very carefully. Recently so many policy statements of an important nature regarding the developmental activities of the State were omitted by the AIR but they highlighted one of the Public Accounts Committee's criticisms of something which had taken place or which had not taken place. This sort of partisan attitude should not be there. The All India Radio and TV should function as autonomous bodies and should cover our State in a more objective manner.

Finally I would conclude by saying that the historic southern CM's meet which took place at Bangalore should not be misconstrued as any confrontation or gang-up against the Centre. Our Chief Minister MGR has announced many times that it is not anti-Centre or anything like that. We are not for confrontation. We are for co-operation and for the progress of the country. The Chief Ministers' meet has enlightened us with the need for more fiscal powers and for more powers for the States in various directions. A strong Centre and a strong State, as the Prime Minister herself said, can go together and particularly as the Finance Minister is very well aware, Tamil Nadu has been managing its finances very well, without raising Reserve Bank overdrafts for huge amounts as is being done by many other States. What is it we get for being good boys? We do not get anything whereas the overdrafts of other States are being converted into loans and all that.

Sir, these are the points which have got to be looked into. We are placing these points before Mr. Chavan in the next Finance Commission. I hope the Centre will take a favourable attitude and see that good boys are rewarded.

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5 P.M.

On points arising out of answer to Unstarred Question No. 2163 given on 4th November 1982 regarding results of INSAT-IA failure investigations and back-up programmes

HALF-AN-HOUR DISCUSSION

SHRI JASWANT SINGH (Rajasthan): Mr. Deputy Chairman, at the outset I would like to say that this debate which is initiated, this Half-an-Hour Discussion, follows out of the reply to a question relating to INSAT-IA. I think it is only proper to mention that in any scientific endeavour what appears to be a failure is really an impetus to renewed effort. Therefore, my debate is also motivated, my queries will also be motivated, with a spirit of inquiry, and if, while inquiring, there are observations, there are questions, which are critical, they are to be seen in the overview of scientific inquiry or an attempt by a layman like me to educate myself with Government's thinking. So we

[Shri Jaswant Singh].

have to see this whole question of INSAT, Indian National Satellite, and the discussion following upon the failure of INSAT-IA in three or four separate compartments.

One is the concept of Indian National Satellite and the reasons for its failure, the other is the aspect of insurance of INSAT-IA, and the third is the follow-up of INSAT-IA in INSAT-IB. I might have some questions to ask of the hon. Minister on this.

When I submitted my notice for this debat to the Chairman, it specifically mentioned that the programme comprising of multi-purpose satellites initiated with the launching of INSAT-IA has many aspects about which the House needs to be informed. The priorities and the costs as also the subsequent back-up arrangement need to be fully discussed. The multi-satellite programme involves various aspects and issues like meteorology, tele-communication including radio and television transmission. Therefore, the discussion has to cover all those aspects as well.

The whole concept of INSAT-IA really originated in 1966. It was then the Department of Atomic Energy which had initiated studies to determine the system configuration, costs and significance of synchronous satellite as also a powerful national system of mass communication, using television. INSAT is a multi-purpose satellite. It combines direct tele-broadcasting, tele-communication and meteorological observations capability. There has been a forerunner to it and that forerunsers was in the idea of, what was called, SITE experiment. This experiment was conducted in 1975-76 and there was a selected group of villages which were chosen. This SITE experiment has direct nexus with the whole concept of Indian National Satellite. The rationale for INSAT was that it would have a short installation time as against the development of a terrestrial television system. The user Ministries of the terrestrial system are naturally the Communication Ministry and the Information and Broadcasting Ministry because they are more interested in it. There was another reasoning given by the Government that it has high cost effectiveness and pay-off calculations. The third advantage possibly was impetus to domestic electronic industries. All the three premises are faulty to my way of looking. The main failure of the direct television broadcast is its inability to provide differential information taking into account region, language, climate and other areas. One could argue that the whole concept of utilising communication or

[**The Vice-Chairman (Shri R. Ramakrishnan)** in the Chair].

development though communication is also a questionable concept. That however, is extraneous to our debate. The claim by the ISRO of cost benefits is also questionable. The cost plans of the INSAT in any case do not include provision for repair and maintenance of community sets. I will be coming to this aspect subsequently. Also in an case, the space component of the installation of the INSAT was only 10 to 15 per cent of the total cost of the scheme. Therefore, the argument that this is the most cost effective way is faulty, in my view. I also feel that the whole concept suffers from another lacuna which is that we have not integrated the lessons of the SITE programme. The Planning Commission studies have also revealed that. Indeed they have stated so. This is a quote from their studies and they have expressed serious reservations about the efficacy of the concept as such.

The Plannig Commission had cautioned against jumping to conclusions about closing the gap between the relatively well-to-do and the traditionally deprived merely on the basis of the total size of the audience for the SITE. Now, there is a point in this. Of course, one of the reasons given for the INSAT is that develop-

ment is possible through communications, a highly questionable concept. This was some of the rationale and I have necessarily to be brief because this is only an Haif-an-Hour Discussion. As I said, SITE led to the INSAT, the Indian National Satellite. Originally the plan was that there would be an experimental satellite followed by what eventually became the INSAT-IA. It was said that INSAT would be progressive and that INSAT-IA was a step in that direction. We have now abandoned this process of progressive development and we have jumped to INSAT-IA. Here I would like to sound a word of grave reservation because, after all, the INSAT IA, however much one may like to commend or compliment our scientists about it, was really no more than a turn-key project. We only commissioned a foreign firm to fabricate this for us and we hired a foreign site for the launching of it. Even the software and the ground control facilities were on a turn-key basis. We would therefore, be mistaken if we treat the whole thing as part of the Indian scientific effort or enterprise. In the total concept, what the whole package of INSAT comprises, I have already mentioned. As I had said earlier, there is television, of course, taking the major cake and there was meteorology, there was communication, I am now constraind to point out the absence of co-ordination between the efforts of the various Ministries in making this a success and the co-ordination necessary was indeed absent between all these various Ministries. And, Sir, I can do no better than to quote about the figures and the actual preparation at the time of the launching of INSAT-IA.

> "The educational programme was also a non-starter largely because very few of them had been prepared and few centres had received the community television sets. The targets for these sets had also been startingly lowered from one hundred thousand to four hundred to be raised to eight thousand in 1985."

would like to be corrected if these figures are wrong. It has further been said:

> "It was mainly for televising the 1½ hour national programme to eight urban centres."

I have already said about the difficulty in taking into account the language, climate, rural dispersal, etc. These are all real difficulties and these are not difficulties of governance.

> "The whole effort was to reach eight urban centres and that also in the 1½ hour programmes every evening. Nor was full use made of this facility by others. The P & T Department was able to utilise only 300 of its 4,000 telecommunication circuits."

Please tell me if this is wrong. Not all our stations were ready. The Meteorological Department had the worst deal with only one data-collecting centres having been completed. It is in this background that the effort at launching the INSAT-IA went about and there was a failure about which we now all know.

A Review Committee was then appointed. The hon. Minister was good enough to make a detailed statement in the last session about the findings of the Review Committee. Now, the statement is here with me. I have gone through it as indeed I had gone through it on that day. But I am constrained to observe that the majority of the members of the Review Committee were those very gentlemen who were involved in the programme itself. Now, you could well say that people imbued with a scientific bent of mind, scientific inquiry, would essentially be fair and just in reviewing their own failures. I would however be extremely cautious about coming to such a conclusion, because when you continue a Review Committee, if the Review Committee essentially has been entrusted with the responsibility of programme, I do not know what you will get out of such a Committee.

[Shri Jaswant Singh].

There was a mention about the solar sail. I have got a specific question about solar sail. I will come to it subsequently. In very much lay terms, the same solar sail is the one which was replaced before launch—and, incidentally, if the launch had been delayed by just 2 more days—if I am not mistaken, it was on the 12th of April—then the lanching pad would no longer have been available because it had been booked in advance and we would have got into an extremely complicated situation. On that, again, I have a specific query to make. The solar sail caused difficulties post-launch. There is a mention that a yaw developed was it there was overloading of the satellite or did it develop because the satellite had used excessive fuel or because the solar sail did not open up. The Minister's statement is not clear on that. Solar sail did not open, and in simple lay terms what happens is that during the period of its orbit the satellite happens to pass through a situation of eclipse of the moon. Its senser gets confused because it gets exposed to a certain limited period of full moon light. It is not able to make out whether there is a difference between the moonlight and sunlight and, therefore, this satellite goes away. Now it circles the earth and it is out of control; we have lost control. As a non-scientist, I am able to make out from the statement made by the Minister that there is a failure here obviously of software. The Minister has been good enough to mention in his statement that there has been a failure because the computer was not able to predict that tiny window of exposure to the full moon. Now if there is a failure of software, there is failure on the turnkey basis; there is also a failure in supervision by our scientists who had gone to inquire into it. There are the reasons given in the Minister's statement itself. I find them of charming ambiguity. The Minister says:

"These cascading set of events covering a duration of about one hour and 16 minutes on September 4, 1982, have been attributed to a complex combination of (1) minor deficiencies in ground control software, (2) lacunae in contingency operations..."

I do not know what the lacunae were and what was the contingency operation procedure that you talk of.

"...(3) unexpected on-board anomalies".

A beautiful phrase! It is unbelievably vague, btcause unless you are wholly with the Department or the Ministry or with the Minister concerned, I for one do not know what all this means. I would request the Minister to clarify this.

On the question of insurance... (*time bell rings*) I won't take very long. On the question of insurance, the statement is particularly, to my mind, unsatisfactory. The insurance package put together in INSAT-IA was made up of five covers. The Minister's statement was not specific about five covers. There was a liability policy for 500 million dollars at a certain premium which I need not go into. This was intended to cover the liability arising from losses due to both property damage and personal injury. This was one of the insurance covers. The other was of prelaunch all risk policy. Now, this particular insurance cover is the one about which I would be subsequently querying and about which the Minister's statement is totally silent. This pre-launch all risk policy was for a sum of 31 million dollars and we paid a premium of 77,500 dollars for this. This was meant to cover the extra expenses that would arise as a result of the launch not taking place as schedule or being postponed due to damage to the satellite or launch vehicle. Then there were three other insurance covers. There was a contractual liability. There was a post-launch all risk policy about which the Minister has stated in his statement. And there was a no-loss return cover for a certain sum which was at a certain premium, and this was like a no claim bonus cover.

Now, sir, there are two particular queries that I have on this insurance. One is regarding this pre-launch all risk cover. Why have we not claimed against this particular cover because the launch was delayed by two days, and as I said earlier, had it got delayed even more, perhaps, we would have lost the launching site altogether. That is one question. If not lost the launch site altogether, we would certainly have got delayed to a very great deal. My second question is: What are the additional insurance costs that we would now have to take into account following upon the failurt of INSAT-IA because even though it may be New India that you have got as insurers, you have got to reinsure. With the failure of INSAT-IA, you would naturally have to insure INSAT-IB. And the insures are not going to be happy with the same insurance. So what are the additional costs that are likely to occur or that which you may be negotiating today? Sir, INSAT-IB was originally conceived essentially as a follow-up satellite. Now, it has become the main satellite. Then the Minister's statement clarifies that the experience that we have gained from INSAT-IA, we are incorporating into INSAT-IB to ensure that the same thing does not happen again. But INSAT-IB to ensure that the same satellite on which we took remedial measures only about failures of launch itself or failures of post-launch. It was to be a satellite into which we put our experience of INSAT-IA and it was also to cater and act like a standby satellite If I am not mistaken, the life of these satellites is only about five years. Therefore, our entire programme of national satellite has been set behind by five years. Therefore, what is your thinking in respect of follow-up satellite, a cover satellite?

Sir, I have some questions and I do not want to labour on this point very much. I would not repeat what I have already asked as questions during my submission. So, I would like to understand from the Government and from the Minister here that we seem to be the only country who, despite not having a single experimental satellite launch, went in far a regular non-experimental multi-purpose satellite. Please understand the distinction I am trying to make because we have gone in for a multi-purpose satellite without an experimental satellite. We gave up the experimental part of it. Now we have gone in for a regular non-experimental multi-purpose satellite. Why did we do that? What are the comparative economics of a multi-mission satellite as against the single or twin-mission satellite? Why did we do this? Through you, Sir, I would like to submit to the hon. Minister that all that we ask as queries need not necessarily be taken in an adversary fashion. I may have some genuine doubts about the whole rationale of the thing. If my questions sound critical, as I said earlier, it is only in a spirit of enquiry that I am asking the Minister. My second question is that two American firms Aerospace and Hughes, they were under consideration for fabrication. Now, one of them was chosen. I am sure he had very good reasons for one against the other and I would not go into that. But now how much responsibility rested on the building contractor and this is outside the whole question of insurance cover. How much responsibility rested on the building contractor? This is a turn-key job that the satellite would work and there must have been a minimum guraantee period. Otherwise, why should we have an insurance? Now, I have asked this earlier and I would like to repeat it very briefly, is it not correct that even the master control facility on ground in India was also on a turn-key basis from the fabricators? My next question is, did the contracting firm at any stage convey its reservations, about the design which it was commissioned to build? I have asked about the excess weight on board the satellite. Is it correct that there was excess weight on the satellite amounting to several kilo-

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grammes? Though I have asked it, I would very briefly repeat it, is it not correct that the solar cell had to be replaced on the eve of the launch? Did something go wrong in the process of reassembly because the review committee is silent on it? (*Time bell rings*). The review committee is silent on that. Is it the same sail which got stuck? I have mentioned about the composition of the review committee. Now, is it not correct that in the entire programme the splitting of the money was that out of around Rs. 85 crores as against Rs. 63 crores were for telecommunications, Rs 12 crores were for meterology and only Rs. 2.9 crores were for radio? What has been the effecet of the failure on INSAT-IA on TV stations and the expansion of the programme of P & T Department? Now, I want to know...

THE VICE-CHAIRMAN (SHRI R. RAMAKRISHNAN): I think you have asked enough questions. Let the Minister answer all these questions now.

SHRI JASWANT SINGH: I will defer to your wishes, Sir. Thank you very much.

THE MINISTER OF STATE IN THE DEPARTMENT OF SCIENCE AND TECHNOLOGY, ATOMIC ENERGY, SPACE, EIECTRONICS AND OCEAN DEVELOPMENT (SHRI SHIVRAJ V. PATIL): Sir, if you permit me, I have a model of the INSAT-IA with me, I can get it here and explain the different parts of the satellite so as to make the points very clear. Do I have your permission?

THE VICE-CHAIRMAN (SHRI R RAMAKRISHNAN): Yes.

SHRI JASWANT SINGH: There is one technical difficulty. I would be very happy to be educated in the matter but if you make an exception about the hon. Minister bringing in the model of a Satellite here, it may not be the right thing. On earlier occasions, we have expressed the desire to play a tape-recorded message which was not permitted. It sets a precedent. If the hon. Minister explained outside and gave me time outside...

THE VICE-CHAIRMAN (SHRI R. RAMAKRISHNAN): You can go to his room and it will save the time of the House. With due respects to your questions, most of which are very scientific...

SHRI JAGDISH PRASAD MAHUR (Uttar Pradesh): You cannot do it in the House here but outside.

SHRI SHIVRAJ V. PATIL: Sir, with full responsibility I make a statement on the floor of the House that the satellite is a model that is not dangerous to any Member of the House and it is in conformity with the rules that are followed by the House that it can be allowed to be brought in the House. If any material has to be brought in the House the only thing which is to be done is to obtain the permission of the hon'ble presiding officer. And, if the presiding officer comes to the conclusion that it is not obnoxious, it is not injurious to the Members, it is going to help the explanation, it can be allowed to be brought in.

THE VICE-CHAIRMAN (SHRI R. RAMAKRISHNAN): I have understood your point and with full knowledge and responsibility I have permitted you to bring it in. The same thing cannot be said of tape-recorded messages or of unauthenticated documents.

SHRI JAGDISH PRASAD MATHUR: We should like to see it but you show it outside the House.

SHRI SHIVRAJ V. PATIL: Then you can ask me the questions outside the House.

SHRI SHIVA CHANDRA JHA (Bihar): By your permission, Mr. Vice-Chairman, if you allow the Minister to bring it here then a precedent is created and we Members also can be entitled to get whatever we want.

SHRI JASWANT SINGH: You have not given your permission yet. I think it is highly irregular.

SHRI SHIVA CHANDRA JHA: If you want to demonstrate, you can do it outside in the lobby.

THE VICE-CHAIRMAN (SHRI R. RAMAKRISHNAN): I have heard your point of order. The Minister has made a request whether he could be permitted to bring in the model in the House, and after hearing him and also that it is with full knowledge and responsibility when the Government says that it is authenticated model, I said that he can bring it in. And when you ask for permission to bring in the tape-recorder, it is for the Chair to admit it or not. Here, I have given my ruling and the ruling stands.

SHRI JAGDISH PRASAD MATHUR: But other Members who are not present, are deprived of it because they will not be able to see it.

SHRI SHIVRAJ V. PATIL: I am thankful to you for permitting me to bring it here. The questioner is a layman and I am also a layman.

SHRI JASWANT SINGH: Somewhat.

THE VICE-CHAIRMAN (SHRI R. RAMAKRISHNAN): He is a lay-member; you are a lay-Minister.

SHRI SHIVRAJ V. PATIL: The only advantage I have is the advantage of briefing.

The approach which the hon. Member wanted to adopt in this respect was that he would like to be enlightened about the different aspects relating to INSAT-I and other aspects relating to it. The approach is laudable and that approach will help us all. But the questions which are put after enunciating the approach, are multifarious and they are such as not to create any confidence or any kind of a feeling of strength in our minds. It is, therefore, my responsibility to explain as to what made the Government take such decisions and what are the benefits which are going to come out of it.

The questions have been mingled with each other in such a fashion that it would be difficult for me to follow the sequence in which they are put. So, I will take up questions relating to technical aspect of the satellite first and then I will answer other questions.

This is the satellite. This is the solar array and this part of the satellite is to balance the array on the other side. When the satellite is launched in the orbit, the solar array opens and to balance the solar array, this solar sail also opens and balances the solar array on this side. These are the antenna. These receive information and they return the information to the ground stations. This is the earth sensor. I will not go into all the details, but what actually happened when the satellite was launched, is this. This satellite was launched; this array opened; but the solar sail did not open. Because this solar sail had to balance the satellite and to keep it in a particular fashion as to the earth, it could not happen because it could not be deployed. So, a yaw developed and in order to correct that yaw, in order to bring it in a position it should have been the mechanism which is inside the satellite, that is, the thrust mechanism to see that the solar sail opens, was utilised. When this was opened, then, there was a yaw. The correction was to be done. Because it was not in a correct position ...

SHRI GHULAM RASOOL MATTO (Jammu and Kashmir): By opening, what do you mean?

SHRI SHIVRAJ V. PATIL: This is closed. It is sitting like this. This did not come out and this could not be in this position. Some other mechanism is inside, the thrust mechanism and all these things. Because it was in a tilted position, it had to be corrected. A yaw had developed which had to be corrected. The correction of yaw was necessary because the solar cell panel should be able to face the sun, create energy, supply the energy to the satellite and keep it functioning in a geo-stationary

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position. That was the purpose of it. When this kind of tilt developed, it had to be corrected. Then, this satellite was passing through an eclipse and because of the tilt, the moonlight interfered. Here, it is very crucial to understand that because of the tilt, the moonlight interfered and this could not be foreseen by the people on the ground and, therefore, it was not possible for them to correct it quickly. They were passing the commands. The commands were not received there. Now, when the commands were passed, because of this tilt, and because the telemetry was not passed on to the ground, difficulties arose. In this satellite, we have the fuel. The propellants. The propellants are used to carry out certain functions over here. The propellants were used for thrusting this out. This hand was also open. Therefore, the propellants were used for opening this antenna also. Now, this propellant, this solid fuel, burns when it comes in contact with Oxygen. Oxidisation takes place. Energy is created and this energy is utilised. Because this correction was to be done, the propellants were used on a scale which was not expected to be used. Therefore, energy was consumed. The energy was consumed in such a fashion that the satellite could not be there in the orbit for seven years or for the period for which it was expected to be there. What happened afterwards was that, when the command was given, the valve which was at the place where the propellant was there, was open. The oxidising agents could not come out and mix with the propellants. Now, because of this dissymmetry also, the fuel could not be used in a proper manner. The fuel was wasted. This also reduced the capacity of this satellite. This is the explanation. Then, this had to be deactivised. The satellite had to be deactivised. This is what happened. I am sorry. The propellant used was liquid fuel in this case; Nitrogen Tetraoxide is the oxidising agent. This is the technical term. I am sorry, I said, solid fuel was used. Because of this defect in the satellite, it had to be deactivised.

Having given this explanation, I would come to other questions which are put by the hon. Member.

Now one of the questions which is put is whether the solar sail was replaced at the last moment. The answer is, no, the solar sail was not replaced at the last moment, it was there from the beginning.

The second qustion which is asked by the hon. Member is whether the contracting party had certain reservations about the weight of the satellite. The answer is in the negative. The contracting party had no reservations, had not expressed their reservations at any time.

Then the question put is whether the master control system is a turnkey system. The answer which I have to give is that it is not a turnkey project or it is not something which is done by others only. Our scientists have also contributed and it has come into existence.

One of the points which is made by the hon. Member is the direct T.V. and broadcast region. He is wanting to know whether this system of relaying the information through the satellite is going to help our country or not. The objection taken by the hon. Member is that in different areas different languages are spoken. In different areas different environments are there. How is it that the centralised system of relaying the information is going to help? If I understood the hon. Member correctly—that is what he wanted to know—the answer to this question which is not a technical question but of a little different kind, is that there are things which have to be relayed from the Centre and which are going t obe useful to the people coming from all parts of the country. Those things which are going to be locally useful can be relayed in the local language. It is a different question if we adopted a different method but as our country is big and as the interest of all the

parts of our country converge on certain points, in that respect information has to be given to them. With respect to our foreign policy, with respect to something which is useful for the country as a whole, in that respect this system can certainly be useful. By having a system of this kind we are not saying that the local relay arrangement will not be available. We may have the local arrangement for the...

SHRI JASWANT SINGH: Just one clarification. Thank you very much. There are two aspects of it. One is the rationale, whether it is good or bad. He has tried to explain it and whether I am convinced or not is a different matter. But about the provision of about 100,000...

SHRI SHIVRAJ V. PATIL: I am coming to it. The first point which was made by the hon. Member was this and I am just dwelling upon that point only. He is saying, when there is diversity, how can you use the central system of relaying the information to different parts of our country and how it is going to help us. The only answer which can be given by me in one sentence is, we have diversity and in that diversity there is unity and the requirements of our unity in that diversity can be met through this kind of system.

The other question which was put by the hon. Member was about the cost effectiveness. According to me, this system is going to be cost effective. According to the information that we have, this system is going to be cost effective in the long run. This is going to help us and this is the method by which it will be possible for us to reach every nook and corner of our country, reach every man living in the valleys, on the hills and in the remote parts of our country. And looked from that point of view and looked from the point of view of long-term gains, this is going to be cost effective.

The other question which was put was, he referred to the SITE programme and all those things. He has put so many questions. I have noted them down and succinctly I am trying to answer each one of them. He says, development through communication is highly questionable. Well, Sir, this is something which is not questionable to our scientists. This is not acceptable in the modern world and to this Philosophy we do not subscribe. I do not admit that it is questionable and that it is not going to be useful.

The hon. Member says that we gave up the philosophy of progressive development and jumped at something which is most sophisticated. That is what he was trying to tell us. The answer to this is, in our Sixth Five Year Plan and in the philosophy which we have adopted for helping our people through the scientific and technological means, it is very clear and we have said it, that in certain areas the appropriate technology, the local technology, the conventional technology will be available, will be improved upon and will help our people. At the same time, we have said that in this modern world, we cannot ask the people living in remote areas that they adopt only the appropriate technology, the local technology and conventional technology and deprive them of the use of the most modern and sophisticated technology. So the approach of our Government is that when we will try to develop the local and conventional technology and help them to overcome the small and big difficulties that are there with the help of that technology, we will provide them the most sophisticated technology, the most modern technology also. When we will improve upon the bullock cart, we will take them to the tractor also. When we will improve upon the small instruments of harvesting and sowing, we will at the same time give them the information about harvesting. about

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seeds, about monsoon, through radio and through TV by using the satellites of this kind. The professors and experts in the agricultural field can go to the radio station, can go to the TV station and they can relay the information to the farmers in the area and we can help them also. On the one hand we use the appropriate technology, on the other hand we use the most sophisticated technology and help the people who are living in the rural areas. So it would be wrong to say that we have given up the philosophy of progressive development. We have adopted that philosophy also, but mixed that philosophy with the modern philosophy and the sophisticated philosophy in such a manner as to give the maximum benefit to the people living in the rural areas, to the people living in the villages.

The next objection which is taken by the hon. Member is, what is the Indian input in this satellite? It is a turn-key project, a project in which the satellite is manufactured by others, the launching is done by others and the tracking of those things also is done with the help of others. So what is Indian about it? What is indigenous about it? Why should we take pride in it? Well, Sir, this is a question which has to be decided by each one of us. Now we have seen ourselves that on the 17th of this month, we launched Rohini with our own rocket—SLV3. That satellite as well as the launching arrangement were also done by us. It is a contribution by the Indian scientists to our community and to the world. How did we develop that kind of capability in our country? Now it is not possible for us to jump very high and catch the object at the highest place. We are going step by step. We may learn from the books, we may learn from the laboratories, we may learn from the factories in which these things are done, we may learn by assembling these things, we may learn by making those things and by assembling these things into certain kinds of instruments. It was a step, it was sort of a step. The satellite was made. Indian scientists were there, they were working with them, learning and they are developing and they will develop the capacity to manufacture a satellite of this kind. So, it would be wrong to say that it did not contribute towards the development of the scientific and technological capability in our country and it was an infructuous attempt. It would be wrong to say that. It was a step in the right direction, it was a step in a direction in which we moved and we collected some confidence in ourselves.

The hon. Member said that the ground facility was not prepared. The hon. Member says that we wanted to use this facility for educational purposes, for telecommunications, for radio, TV and meteorological purposes but the facilities were not provided. I would submit that we have developed the facilities for these purposes. Maybe, all the facilities which are required for making use of this satellite to the fullest extent may not be there, but we have developed the facilities.

Now I have the information about the telecommunication facilities. Now we have about 28 fixed earth stations for telecommunications, TV and radio —it is not eight but 28. Then, the three transportable stations are there. About 1,700 two-way speech circuits would be available for telecommunications and 50—50 terminals for radio. As to giving instruction to our children using this satellite for educational purposes, a certain kind of thinking has to be done, a certain kind of information has to be collected and a certain kind of method of imparting instruction to the children has to be done by us. As time passes, we will do that. So, it would be wrong to say that we were not prepared for that purpose. In fact, we are prepared for that purpose and the process of preparing still more is going on.

Now, one of the objections taken was about the constitution, the composition, of the Committee. It was said that the committee consisted of only those people who were involved in that project and so there was no point in getting a report from them and relying on that report. Sir, I would inform this august House that there were about ten members, out of 19 members, who had nothing to do with this project. Then we had four U.S. advisers in this committee and there were others also. The representatives of the user-Ministries also were there. The representatives of Communications Ministry, Doordarshan representatives and the Meteorological Department were also there; about three members were there. They also participated, they put their heads together, examined everything very minutely, in detail, and they gave the report as to what went wrong and how that had to be corrected in future also. Now, this was examined by the experts in the U.S.A. also and the report given by them tallies with the report of ours. They examined our report and they came to the conclusion that our report was correct and the line which has to be adopted in launching INSAT-B also would be the same as is suggested by these gentlemen. So, it would be wrong to say that this committee was a committee only of those who were involved in it. Of course, when a thing of this nature has to be done, the people who know about the science and who know about all these things would certainly be there and they would be helpful in doing it. A question was raised about insurance. Now the satellite was insured for 65.55 million US dollars. It was a total risk. It was insured with an Indian company, and the Indian company insured it with the UK and the US companies. A survey was made by the surveyors appointed by the company which had taken up the responsibility from the Indian company, and they have come to the conclusion that it was a total loss and they have agreed to reimburse for the loss, compensate for the loss. About 49 million US dollars have already been deposited and the rest of the money is going to come to us. So in terms of financial loss or gain, we would say that it has not caused a great difficulty. We have been able to get the loss compensated for.

About other things, it is not necessary, if the accident had not taken place, if anybody has suffered, if any human being has suffered. Human beings were insured for that purpose. We cannot get any compensation for that also. So this point that the insurance was...

SHRI JASWANT SINGH: There was a question about the pre-launch delay.

SHRI SHIVRAJ V. PATIL: Pre-launch delays and all other things have been covered. These are the things about which I would not be able to answer unless I get the details. Whether the delay was insured or not, whether the accidents were insured or not. These questions are there. What was our total loss, how much we have gained, and what could have happened—all these things are there. But one thing which has to be borne in mind by us is that it is something which relates to the cosmos as such, it is something we are sending into the cosmos; in the orbit, a small object is sent by man and there are many elements acting and reacting and inter-acting. And what is actually going to happen, when it is going to happen—all these things are there. We have to be careful about these things. All the care that should have been taken by our people was really taken and we could foresee certain things; and we saw to it that it was insured against those kinds of risks. About other things, if you want, I can give the information later on.

A question was raised, this is a multi-purpose satellite, why did we

[Shri Shivraj V. Patil].

take this kind of risk? I would say that this is something where we had put many instruments which were going to help in three or four fields, but there have been satellites launched by other countries where the functions that have to be carried on by the satellite are two or three or even more. We know at least two functions have been carried out by satellites. But there are certain satellites which carry out many functions. The conclusion which is drawn by this committee—and it is endorsed by the scientists in the USA also, who are experts and well versed in this—is that the model and the shape and the manner in which it was done is correct; there was nothing wrong in putting these three things in one satellite and trying to make use of it. So they have endorsed this thing.

You referred to certain words and phrases in the Statement. Of course, our scientists and some of us are also very articulate with the language they choose. What did it mean? I explained to you that this sail could not be deployed, this antenna could not be deployed. Certain things happened inside and because of those things it had to be de-activated. That I explained, but I explained that thing only in a few words. That does not mean that we are trying to keep the country in darkness about this. Everything has been explained. If it has to be explained very succinctly, if it has to be explained very succinctly, if it has to be explained in a few words, the technical words are certainly bound to be used, and we, the laymen, sometimes do not appreciate the full meaning of the technical phraseology which is used in the statements. But what I am trying to say is that it has not been a mistake to use this kind of satellite which would be catering to the demands in different fields. That has been endorsed by the committee, that has been endorsed by the experts coming from other countries also.

Sir, I think, for 180 days this satellite was to be looked after by the people who had helped us, and it was insured for that period also.

Sir, I have tried to answer almost all the questions which were raised by the hon. Member. He has really raised a very interesting discussion, and I thank him for giving us the opportunity to explain what really happened and the philosophy behind manufacturing, making the satellite and putting it into orbit.

THE VICE-CHAIRMAN (SHRI R. RAMAKRISHNAN): Shri Hukmdev Narayan Yadav not here. Shri Ramachandra Rao.

PROF. B. RAMACHANDRA RAO (Andhra Pradesh): Mr. Vice-Chairman, after the detailed explanation by the Minister concerned in response to the...

श्री शिव चन्द्र झा : मैंने 11 बजे का नोटिस दिया हुआ है, ।

उप सभापति (श्री आर० रामाकृष्णन्) मेरे पास नहीं है।

श्री शिव चन्द्र झा : सेक्रटरी के हाथ में दिया है, क्या बात कर रहे हैं। (व्यवधान) 11 बजे सबसे पहले मेरा दिया हुआ रहता है। (व्यवधान) यह तो कांसपिरेसी है। (व्यवधान) मैं सुबह नोटिस आफिस में देता हूं वहां टाइम लिखा रहता है (व्यवधान)

PROF. B. RAMACHANDRA RAO: Mr. Chairman, I would like to mention here.....

THE VICE-CHAIRMAN (SHRI R. RAMAKRISHNAN): Prof. Rao, please Let Mr. Jha speak.

SHRI SHIVA CHANDRA JHA: This sazish should be stopped.

THE VICE-CHAIRMAN (SHRI R. RAMAKRISHNAN): The list has been corrected. You please ask now.

SHRI SHIVA CHANDRA JHA: Whether INSAT-IA failed because of machanical reasons or human reasons, although important in themselves, are secondary. We are proud even of that failure. That was our great attempt to get into the space world, to march with other countries. So, personally I am very proud at the attempt that was made through INSAT-IA, no matter what the outcome came later on. It has been duly investigated into, and for the future efforts should be made so that there is no failure. Whether the moonlight came in the way or it was not detected from the ground, these are secondary things. This is the way, Sir, man has conquered nature. We can recall the days of the Wright Brothers making attempts to fly.

Sir, personally I am very proud of that. The question that arises from this discussion is the amount of money that is being spent because in our country when 48 per cent of people, 48 per cent of the population, are living below the poverty-line, that much amount is being spent on these experiments which are time-consuming, which will produce results no doubt, but after some time. In the mean time we could have done many other things which are not being done. These are the things that worries us. So, it would be more clarifying if the hon. Minister will say how much money was spent, in absolute terms—do not say we did not lose; these are secondary things—the absolute amount that was spent in the making and the launching etc. of INSAT-IA. We can figure out of this amount that if other development works would have been done, this much would have been in our country. That much progress would have been made, we can visualise from that figure. That is one thing because we have to go among the people and explain to them that this is something which we are proud of. So, no matter how much money is spent, that has to be explained. This Government or the Janata Government, every Government shall have to do it.

And how Rohini is in the space. Not only that. Our two young men, Mr. Malhotra and Mr. Sharma, are being trained in Moscow, and very soon they will be going into space. Everyday more or less I am watching their being trained there and how they will be going into space. We are proud of that.

6 P.M.

And not only that, we are looking forward to the day when an Indian would be landing on the Moon. Americans have landed on the Moon and the Russians have landed on the Moon. And so I am personally waiting for the day when an Indian would be landing on the Moon. That will be a grand day, the longest day in the history of India. So these are all good things.

Regarding telecommunications, I have personal experience of the satellite communication. Even from India if you book an international call to the USA or to the UK, within five minutes we can talk to the other end. Here in our communications system, even in five days I cannot talk to a person in Madhubani. But because of the satellite communication, within five minutes I can talk to my brother who is in the United States. So my personal wish is that this satellite communication system should be started all over the country and even district headquarters should be linked with the Capital by satellite communication. That day also would be a grand day. These are all good things.

Concerning the benefits, the Minister mentioned meteorology, monsoon and all those things. All these are very good. But what I want to know, although he won't be able to go into details, is concerning the defence, the possibilities of the use of the satellite for defence purposes. Can you throw any light on this aspect as to what benefit would come to us in defence matters, to protect our territory for the security of the country?

[Shri Shiva Chandra Jha.]

Another thing. Whether it is Rohini or INSAT, our indigenous components are there. Our Indian scientists are working there. We are proud of them. But still there are very many Indian scientists living abroad. We are not wating for them. India is not waiting for these scientists to come and work here. But we would like to have some plan from the side of the Government to bring them back, some kind of incentives, so that an attempt is made to bring back to the country our scientists like Chandrasekhar, Khurana and others who are outside India. That will be an asset to our efforts here. So I would like to know what effort is being made by the Government to bring our scientists and technologists settled abroad.

The third and last question. Mr. Vice-Chairman is about the messages that are being sent from the satellite either by Rohini or by INSAT-IA. Are these messages not being tapped by other stations of other countries? They have their own ground stations. Are these messages not being tapped? So I want this matter to be clarified whether by our messages being tapped by them, we are put into trouble, we are put into difficulty, or there won't be any difficulty, no matter how much they tap our messages.

So these are my question—cost, benefits from the defence point of view and the possibility of messages being tapped by other stations in other countries.

SHRI SHIVRAJ V. PATIL: Sir, my answers as for the question No. 1 is that on INSAT-1, Space Segment 2-INSAT—in orbit, etc., the expenditure which will be incurred by us would be Rs. 113 crores. Now up to 1982 the expenditure which has been incured is Rs. 87.8 crores. Now this includes the expenditure incurred on setting up the facilities on the ground also and all those things.

By sending this satellite in orbit, we have not incurred any great loss because it was insured and we are getting the compensation. There is no great loss. On the contrary we have something which helps us in getting knowledge.

As to the second question, I have made it very clear that this satellite was to assist us in communication, in TV and radio programmes and in matters meteorological. It has no Defence angle as such. So it would be wrong...

SHRI SHIVA CHANDRA JHA: But it can be used for Defence purposes if the need arises.

SHRI SHIVRAJ V. PATIL: I would say any knowledge is strength. So, it was not sent in the orbit for obtaining anything for the Defence purposes. But any knowledge is strength.

The third point is: What are we going to do to bring our scientists working in other countries? Well, we would very much like them to come back and to help our people and our country. When they come back, we recognise their erudition, their competence, and we would like to make use of it. We have been saying that if they come back, they would be welcome here. But at the same time we have to take into account those scientists also who are working in our country and contributing their best. They had not gone out; they had remained here; they have worked in the conditions which are prevalent in our country and contributed. We value their services also...

SHRI SHIVA CHANDRA JHA: The question is about the specific field, a particular scientific field. At present is any new thing being done or not?

SHRI SHIVRAJ V. PATIL: Now, it will require a very elaborate answer and I would request the Member not to ask for a very elaborate answer on this point because I was concentrating on one aspect of the science.

Now, this next question is whether it can be tapped by other stations in

other countries. What are they going to gain by tapping our messages? If we are taking photographs of the sea, of the land, of the season and all those things, well, they will be useful to us. They would be useful to anyone else also. And they have their own satellites. This is a satellite for a peculiar purpose and different frequencies and other things are involved in this. I don't think that anybody would try to tap what it is getting and make use of it.

PROF. B. RAMACHANDRA RAO (Andhra Pradesh): Mr. Vice-Chairman, I would be very brief after a detailed discussion and an excellent presentation by the Minister. Although I am basically a space scientist, I am very much impressed by the way and the lucid manner in which he has presented the model, the functioning and the causes for the failure of the INSAT-1A. Let me at the outset say that INSAT-1A's failure is not a failure in the strict sense of the term. It is a success in the sense that every failure is a stepping stone to success and I am sure the lessons learnt in INSAT-1A will be incorporated in INSAT-1B and we will make sure that INSAT-1B not only works in the normal fashion but perhaps in a better fashion after it is launched in the month of November as expected. I would like to congratulate the scientists, the leaders in the field of science and technology, who have designed, developed, closely in consultation with the foreign experts, this satellite. The explanation offered for the failure of INSAT-1A is really convincing. It is unexpected. It is a kind of thing which even by flight of imagination one would not have expected that INSAT-1A tilts to such an angle, that it passes the eclipse point at that particular time. It is something even an astrologer would not be able to predict. Let me say that it was rather unfortunate that it had happened; otherwise, INSAT-1A would have been very successful. I would like to highlight only two or three points. One of them is that the launching of the recent Rohini satellite and the demonstration of the multi-stage rocket that has been designed at Sriharikota will possibly enable us to go even for the space shuttle programme in future. Although the technology and know-how for the satellite are quite conventional, Indian scientists and technologists have gained considerable experience in this field. It is true that we have lost the opportunity of taking advantage of the meteorological observations through the interim arrangement made by the Government. I do hope that it will be compensated very soon by the launching of INSAT-1B. I would like to mention here that the meteorological department has available the cloud imagery from the Nimbus and Tiros satellite almost at 6 to 12 hours interval daily enabling us to know the wether conditions.

I am rather tempted to refer to some of the comments made by Mr. Jha, namely, that in a country where nearly 50 per cent of the population is below the poverty line why should we waste money on such experiments? I am afraid this is not a good argument. We cannot take the country backwards. If the country has to move forward, we have to know the diseases of the various crops, we should know our mineral resources, water resources using remote sensing technology that has to be adopted. All these require use of satellite. By adopting primitive methods we cannot take the country forward. I would also like to mention that one of the important aspects of our satellite technology will be to educate people. The SITE experiment, as Mr. Jaswant Singh said, was not a total failure. Technically it was a great success. The major criticism from the Planning Commission report was lack of sufficient soft-ware to utilise it fully and effectively.

In years to come educational television will make our country enlightened. People will be able to know what is happening and modern knowledge including appropriate techno-

logy can be carried to the villages. Somebody has mentioned or asked how a country with diverse languages could use a single satellite. Even for the purpose of integrating the country it is necessary to have a satellite. Even in a country like ours with diverse languages this will work well. If you want to cover the entire Tamil Nadu by TV, you have to transmit TV signals from Madras to the satellite and then beam it back. So, even for the purpose of use diverse languages, we need satellitle technology. Satellites have multi-dimensional uses. I have seen very often that satellite and rockets and various kinds of instruments being used to photograph underground water resources directly in television picture. Lastly, possibilities of application of satellite technology to defence are enormous.

And, Sir, we cannot close our eyes to this aspect. You can have a beam of laser, beamed to the satellite and then return it back to the ground and you can communicate and kind of signal, any kind of information, any kind of scientific knowledge, without any enemy interception and this is one of the greatest future potentialities that would be available to the users of satellite by combining it with the laser. Thank you very much, Sir.

SHRI SHIVRAJ V. PATIL: Sir, I would like to thank the honourable Member for congratulating the scientists. One point which has been made by the honourable Member, which was made by the other honourable Member also, relates to the amount of money that we are spending on our satellite programmes and other things.

Sir, in the first place, the amount of money which we are spending is very meagre. Secondly, when we are trying to acquire knowledge, we do not attach any importance to the amount of money which is spent. Thirdly, as the Prime Minister put it, when we educate our children, we do not say that we are wasting our money; in fact, we are investing our money. In educating them, we are giving them the power, we are giving them the knowledge, we are giving them the capacity. In the same fashion, by spending some money on these projects and programmes, we are trying to create a fund of knowledge, of capability and of power and it is going to help us in the long run. I do not have the exact figure relating to the amount of money that we are spending on education in India. But it runs into thousands of crores of rupees. Now, is that a waste? Is it not going to be useful? If we are spending that money, is it not going to help us? We wait for the children to grow up for ten years or fifteen years, to come of age, to acquire that capacity and to be useful to the society. Can't we apply the same principle to this kind of a thing also? When we are creating thermal power stations, we are waiting for seven years or eight years or ten years. Now, is spending money on the construction of thermal power stations a waste? Is it not going to be useful to us? When the Bhakra-Nangal Dam was being constructed, they were asking: "How long have we to wait?". We waited for ten years or fifteen years and that project has started giving us fruits. And the same principle will also apply here and we have to look at this from that angle. The satellite technology, the space science and the knowledge which we are going to have are going to help us in spreading education, in giving education to our children, in imparting instructions to our children and to help people in the rural areas. This is going to facilitate communication and it is going to give us many kinds of facilities in communication and, therefore, we have to look at it from that angle.

As far as the Government is concerned, Sir, what is its stand with regard to the language? True, we have different languages spoken in different parts of the country. But, at the same time, we are trying to create a language which is understood by all people and that object can be

achieved. We are not going to create that kind of capability at the cost of languages which are being spoken in different parts of the country. We are trying to give the people the capacity to understand a common language also. We can use English, we can use Sanskrit, we can use Hindi and we can use any other language for this purpose and we can overcome this difficulty also.

About the other things, Sir I need not say much. It is not answering his question, but reinforcing what the honourable Member has said.

SHRI VISHVAJIT PRITHVIJIT SINGH (Maharashtra): Sir, I won't like to take much time. I will start off by saying, rather endorsing what all the other Members have said, that technological advance is a matter of pride for any nation, especially a third-world nation like India and it requires a particular spirit, the spirit of adventure and the spirit of endeavour, to move forward and farther into fields which are unknown to us as yet. Research and development is the life-blood of technological advance and for any third-world country the chances that are open are very few. One can either buy technology from abroad at rates which are cheaper, a technology which is easily available, and utilise it or develop that same technology within the country at a much higher cost.

In India, Mr. Vice-Chairman, we follow the golden mean. We import technology from abroad and support it by the work of our own scientists and technocrats. That is what I understand we have done in this particular project.

When this discussion took place, I thought that the hon. Member from Rajasthan, Shri Jaswant Singhji, would touch upon the causes of failure of INSAT-1A—which he did. I expected that Shri Jaswant Singhji would elicit information from the Minister—which he did. I expected him to congratulate the scientists for whatever they have managed to achieve—which he did. But, unfortunately, Sir, his honeyed words contain a poison pill. He is insidious in his assertions which he has made. Every single statement that he has made today regarding the various points about the satellite has been totally controverted by the Minister. The Minister has contradicted very accurately and aptly each and every point. He has quoted out of context the Planning Commission. He denigrates our scientists. He has derided everything. I can only come to one conclusion: he is a disciplined soldier. I know he is a disciplined soldier. He has been a soldier of the Army. Now he is a soldier of that para-military force which is known as the RSS—I am sorry, Jana Sangh...no, what is now known as Bharatiya Janata Party. (*Interruptions*) Therefore, I do not blame him at all. He is a very good man. I am very fond of him. I know him well. He is a good man. He is not to be blamed. It is not he who is doing it but it is his mentors who are speaking through him, and I don't blame him, Mr. Vice-Chairman.

That's all I have to say.

PROF. (MRS.) ASIMA CHATTERJEE (Nominated): I thank you, Mr. Vice-Chairman, for giving me an opportunity to speak on this occasion (on INSAT-1A). I would like to congratulate the hon. Minister for explaining in details the mechanistic aspects of the functioning of the satellite. And, also, I would like to congratulate our space scientists and technologists for their achievements in space research.

Now, the question is that before this satellite, with all its parameters, starts functioning, there ar many parameters which might be responsible for interfering with the functioning of the satellite. Now, in space, many things are going to happen. And why didn't the solar sail open? The most important factor is the temperature, as mentioned already. And why did it

[Prof. (Mrs.) Asime Chatterjee].

get tilted? That is yet to be explained. Secondly, there are other causes which I would like to mention, because before it starts functioning there are several astronomical phenomena which might disturb its functioning like the slight variations in gravitational forces, cosmic showers, fall of meteors from the upper sphere to the surface of the earth, erosion from the surface of the celestial bodies. In the upper space, thousands and thousands of miles away where there are so many planets functioning in a disciplined way, there are many astronomical phenomena which might hamper the functioning of this satellite. These are to be investigated. I am definite that these would be the future research problems of our space scientists.

With these few words, I would like to conclude congratulating once again our space scientists and technologists. Also, I would congratulate the hon. Minister for nicely explaining the functioning of the satellite INSAT-1A. *(Interruptions)*

THE VICE-CHAIRMAN (SHRI R. RAMAKRISHNAN): She has enumerated some of the causes for the failure making your task easier. Do you want to say something, Mr. Minister?

SHRI SHIVRAJ V. PATIL: Well, Sir, I stand up to thank hon. Shri Vishvajit Prithvijit Singh and the hon. Lady Member who have patted the scientists on their back for their achievements. That is the only thing that I want to say.

THE VICE-CHAIRMAN (SHRI P. RAMAKRISHNAN): That concludes the Half-an-Hour Discussion. Now, I have an Announcement to make.

ANNOUNCEMENTS RE. GOVERNMENT LEGISLATIVE AND OTHER BUSINESS FOR THE WEEK COMMENCING FROM MONDAY, THE 2ND MAY, 1983.

THE VICE-CHAIRMAN (SHRI R. RAMAKRISHNAN): I have to inform the Members that the Business Advisory Committee at its meeting held today, the 28th April, 1983, allotted time for Government Legislative and other Business as follow:

	Business	*Time Allotted*
1.	Consideration and return of the Appropriation (No. 3) Bill, 1983 as passed by the Lok Sabha.	1 day in addition to the time already taken today
2.	Discussion on the working of the Ministry of Rural Development.	1 day
3.	Consideration and passing of the Hospitals and other Institutions (Settlement of Disputes) Bill, 1982	1 day
4.	Consideration and return of the Finance Bill, 1983, as passed by the Lok Sabha.	2 days

The Committee recommended that the House should sit up to 6 p.m. daily and beyond 6 p.m. as and when necessary, for the transaction of Government Business.

The House stands adjourned till 11.00 A. M. tomorrow.

The House then adjourned at twenty-nine minutes past six of the clock till eleven of the clock on Friday, the 29th April 1983.
