and let them start a co-operative rice mill. This Bill does not take that into consideration.

I have got any number of other points which I am afraid I have not got the time to deal with. The exemption under clause 18 practically neutralises or negatives the purpose of this Bill. You have power to exempt in special cases. Any number of exemptions could easily be given.

I submit that these are some of the vital matters if we are thinking of encouraging hand-pounding of rice and if we are thinking of having these rice mills only where absolutely necessary and inevitable. Therefore, I beg the hon. Minister to accept the amendment of my hon. friend, Shri Guha, to refer it to the Select Committee.

Pandit K. C. Sharma: Mr. Deputy-Speaker, Sir, I very attentively listened to the speeches of my hon. friends, particularly the hon. Communist lady Member from Bengal. One thing I would like to say is, looking deeply into this legislation it seems to be ill-conceived and its objectives are not salutary.

The first question is about employment. My serious objection is that this type of labour is given in jails to the hard criminals—this pounding of rice. Do you think you can avoid the major problem of unemployment by putting women on this hard labour?

Mr. Deputy-Speaker: The hon. Member feels very strongly on it; he may continue tomorrow.

Pandit K. C. Sharma: No, Sir. In the long range of evolution man and woman have become tender....

Mr. Deputy-Speaker: Order, order. He may continue tomorrow. Shri V. P. Nayar may now raise the discussion.

SCIENTIFIC POLICY RESOLUTION

Shri V. P. Nayar (Quilon): Mr. Deputy-Speaker,.....

Shri Balasaheb Patil: Before he starts, Sir, I would like to point out that there is no quorum.

Mr. Deputy-Speaker: There is quorum, I think.

Shri Balasaheb Patil: No, Sir; four more Members are required to make the quorum.

Mr. Deputy-Speaker: The bell is being rung.

There is quorum now. Shri Nayar may raise the discussion.

Shri V. P. Nayar: Mr. Deputy-Speaker, Sir, I beg to move:

> "That the Scientific Policy Resolution of the Government of India dated the 4th March, 1958, laid on the Table of the House on the 13th March, 1958, be taken into consideration."

Sir, my object in raising this discussion is to focus the attention of the House on a matter of supreme importance for our country's future, namely, the necessity to pursue a correct and dynamic policy in regard to science and technology. The Scientific Policy Resolution of the 4th March is, indeed, very welcome, although I consider that it is belated. In 1948, when the Government of India came out with an Industrial Policy Resolution, it was about time that the Govenment of India came out with a policy like the one which they have now given to us.

After the 1948 resolution on industrial policy, we have had two Plans. They were drafted, discussed at length, debated and accepted as final. But we find that the Plans could not succeed to the extent desirable or to the extent we expected, because Government did not have a scientific policy on the basis of which they had to work the Plans. The result of that is, today, all over the country there is misuse of even the available talent in science and technology. There is not merely misuse, there is improper use also. It is not confined to one sphere only but it extends to all spheres; it

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extends from the ministerial level down to the level of agricultural demonstrators. It happens in the Union Government as well as in the State Governments.

I shall give you, Sir, some examples. Take, for example, the case of Bengal, where the Chief Minister is one of the most eminent physicians of India—Dr. Bidhan Chandra Roy. Unfortunately, he does not take over the portfolio of health. Again, Sir, in Bombay you find such an eminent physician as Dr. Jlwaraj Mehta who does not want public health to be with him but takes over finance. In Madras, Dr. U. Krishna Rao who is a very eminent doctor happens to be the Speaker. Kerala happens to be an exception—the available doctor Member in the Assembly has been used as the Minister of Health. This happens right from the level of Ministers down to the level of agricultural inspectors and demonstrators. The agricultural demonstrators, who have had a fundamental training in agriculture, are today forced to keep records of chemical fertilisers which they give or statistics about the land in respect of cultivation of crops. Very little do they have to do with the real tillers of the soil, and very little do they advise them because there is no machinery. Such is the fate, Sir, that even in this context of development the system is such, the use of science and technology is such that it has not been possible for the Government to conserve and use all available talent, experience and resources for the betterment of our country. This is because, I feel, we do not have a firm, dynamic scientific policy to pursue. Therefore, it is all the more welcome that, at last, Government have come out with a policy.

Sir, this policy resolution is, indeed, very well worded. But I do not think that in the last paragraph—the operative provision which proclaims the aims and objects—it says anything which would suggest that Government are really aware of the magnitude of the problem.

We have had the misfortune in this country to see that scientists aspire for political posts. Very learned persons with long experience in research do not want to continue in their field but want to be principals of colleges, and once they become principals of colleges they have nothing again to do with research. It does not stop there. Then they want to be Vice-Chancellors, engineers want to be Secretaries to Government and agricultural experts want to be doing administrative jobs. There are many many examples, either at the Centre or at the State level. This, I submit, Sir, has to be prevented and, if we have any firm policy in the matter of scientific planning, we should try our best to utilise all the possible talent and experience of our men and women, gained so far by their work in the field of science, for the nation as a whole.

Sir, I submit that Government have not looked into this problem. The result is obvious. We have got our national institutions, the national laboratories. Even there is not the proper approach. I have visited some of them officially and some others in a private capacity. I had been to the Kharagpur Institute of Technology. I was really astonished when I heard from some of those in charge of the Institute that, so far even industries in the public sector do not refer their specific problems for solution to that Institute. I can quite well understand if the private sector in this country do not take advantage of that, but even Government run factories like the Machine Tools Factory, the Bharat Electronic Works or some other factories do not refer their complicated problems for solution to that Institute. They know that in the Kharagpur Institute of Technology there are facilities for higher research in certain subjects which are wanted. I asked a specific question whether the Railways had referred the matter of finding out a solution for cheap refrigeration facilities in order that it may be possible for our country to move

perishable goods in refrigerated vans at cheaper cost. I was surprised to learn that the problem was not referred to it.

I do not want to go into the details, because I have many of them. It is not necessary, either; because, I only want to impress this point that, although we have our national laboratories and in them we have far exceeded the quantum of necessary window-dressing though in a rather lackadaisical way, I am afraid, the proper approach is not made. Take, for instance, the case of division of subjects for research. I do not want to discuss the merit of fundamental research as against research in applied science, because it will be too theoretical. I do not for a moment wish that we should not do fundamental research. It is necessary—that is obvious. But in the matter of research in applied science, I do not understand why the subject should be so chosen as if they have necessarily to conform to the list of Seventh Schedule in the Constitution, why there should be a distinction between State subject and Central Subject. In this session you will remember, Sir, that I had asked some questions about some of the very essential works which could be taken on hand. I am making pointed reference to the case of cashew-shell oil, for instance. Cashew-shell oil is a very useful material, as a raw material for the plastic industry for which there is great scope. I am told in answer that if the Kerala Government submits a scheme, the Centre will subsidise it. Where is the national laboratory there? Just because the cashew tree grows in abundance in Kerala, are we to be told that the Kerala University or the Kerala Government should have a separate research scheme? The product of that industry is vital to the whole of the nation.

Take again the case of lemon-grass oil. We know that lemon-grass oil is today exported for the synthesis of vitamins and also for the extraction of some aromatic chemicals and iron ore. Why is it that we do not have a process of developing it? You will remember, Sir, that when you were in the Chair sometime ago we raised the discussion here on anti-oxidants. Later on I was told that anti-oxidants are required to the tune of Rs. 65 lakhs to Rs. 70 lakhs, and it is required very badly for certain industries like the rubber industry, the vegetable oil industry and the leather industry and the like. Here, in the Pusa Institute, the anti-oxidant scheme from a very, very cheap raw material, a plant growing in a wild condition in the forests of Kerala, has been worked out to the last detail. When I asked what is the chance of commercial exploitation and the necessary research for that, I was told that it is open to the Kerala University to submit a scheme. Therefore, I say that even in the matter of work which is necessary for the whole nation, the subjects are chosen in such a way that it is impossible for us to pursue our point of view in regard to this matter.

I would also refer in particular to another aspect. We say that we have before us the goal of ushering in a socialist pattern of society. I am glad that Shri Humayun Kabir is here, because later on I shall quote from his own report. What is the way in which we are functioning? Have we made necessary changes to the system of our education giving a place of predominance to science in this country? The result is that today, chemistry graduates, physics graduates with first-class, and graduates with distinction in biology—they all have the misfortune to work as, and search for employment as, lower division clerks, as stenographers, as typists and even as conductors in buses. This is the position of our country. In this context, when a policy is laid down, we must also take into account the mistakes we have committed in the past and try to avoid them in future.

By reading the resolution, at any rate I am not competent to understand it in full. I do not believe that the

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scientific policy, as you find in the resolution, really means that we are going to change the system of our education into which can be fitted these schemes and the plans according to this policy. I do not find any particular encouragement, and higher science today remains as a preserve for the few. I was reading the very illuminating report of my hon. friend Shri Humayun Kabir after he led a team to the Soviet Union and therein he says that education in the Soviet Union places a pronounced emphasis on science. What is our plan to place a pronounced emphasis on science in the matter of our educational institutions? I do not see any, because we have not devided even on the various courses of education. Later on in the report he gives certain figures which are very revealing and which show the difference between the development of science in a capitalist society and the development of science in a socialist society. If we say that we want to go the socialist way, there is no getting away from the fact that we have to develop our science also on that basis. We cannot hope to go forward to socialism developing our science, technology and everything on the basis of a capitalist society as it appears to be done.

Shri Humayun Kabir compares the figures of the USSR and the USA and says that by 1960 USSR will have 100,000 graduates whose qualifications can be equated with the bachelor's degree in the United Kingodm, while, at the same time, the United States of America will have only 38,000. Knowing this, it is no wonder for us to find out that in the race or competition in science, it has been possible for socialist science to launch the first satellite and place it in its orbit. We want our science to be more broad-based. We want every young man and woman, every boy and girl, in this country first to think that it is his or her duty to be a scientist, ar engineer or a technologist, so that he or she may contribute his or her share in the construction and production in our country.

I do not propose to go into details. I would only urge upon the Government to consider whether it is not time that we sat together, that we assessed the drawbacks we have so far had and we took into account the defects which are patent from the way in which we are using our available talent and also found out the necessary means by which we can use all the experience we have gained in these years.

I would also seriously suggest to the hon. Minister that it is time that a conference of scientists was called. I do not refer to the particular conference we are having every year—the Science Congress—but I want the Government to consider whether it is not time that a conference of representative scientists should be called for and asked to study and report on the needs and problems of our country, and then try and find out whether this policy by itself, as it is worded today and presented before the House, will be enough. I want to impress again on the Government that I am not opposing it. On the other hand, I welcome this resolution, and I am glad that the House has got an opportunity for the discussion of such a very important matter.

Mr. Deputy-Speaker: Motion moved:

> "That the Scientific Policy Resolution of the Government of India dated the 4th March, 1958, laid on the Table of the House on the 13th March, 1958, be taken into consideration."

Shri Goray (Poona): Mr. Deputy-Speaker, Sir, I welcome this opportunity, because in my opinion, the scientific policy resolution that has been placed before us is a landmark in our history. When we look back, we find that very little attention was bestowed on science during the last 2,000 years in this land. The general attitude was that this universe around us was an illusion. Today, I am reminded of the famous lines in Sanskrit:

यस्मिन्निदं जगम शेषमशेष मूततौ ।
रज्वां भुजंगम इव प्रतिभासितं वै ।।

Just as a rope creates the illusion of a serpent and a man is misled by it, this whole universe is not real; it is only an illusion. Having come to that conclusion, naturally, we considered that to go into the causes and effects of these surroundings of the material world was only a futile effort, a futile pursuit. The intelligent and the wise people having withdrawn from this pursuit, the quacks and the charlatans had their day and that is why even today, when we are thinking in terms of this scientific policy resolution, we find lakhs of our people gathering for the Kumbh Mela and the solar eclipse.

I welcome this resolution because I think that this is the expression of our resolve that we are registering a break from this tradition of irrational and unscientific thinking. I was very glad to read that the heart of the matter was expressed in these very convincing words in the second paragraph of this resolution:

> "The dominating feature of the contemporary world is the intense cultivation of science on a large scale, and its application to meet a country's requirements. It is this, which, for the first time in man's history, has given the common man in countries advanced in science a standard of living and social and cultural amenities, which were once confined to a very small privileged minority of the population.
>
> Science has led to the growth and diffusion of culture to an extent never possible before. It has not only radically altered man's material environment, but, what is of still deeper significance, it has provided new tools of thought and has extended man's mental horizon. It has thus influenced even the basic values of life and given to civilization a new vitality and a new dynamism."

14·51 hrs.

[MR. DEPUTY-SPEAKER *in the Chair*]

We find these sentiments echoed in the second Five Year Plan dealing with scientific research and education. But the question is, having announced our policy as regards education and scientific research, what are we actually going to do?

The state of affairs as it exists today is not very encouraging. In the second Five Year Plan, we find that we have about 33 universities, 14 national laboratories functioning under the Council of Scientific and Industrial Research, 88 research institutes and research centres and 54 associations in the field of scientific and technological research. This is quite an imposing list, but if we try to find out how much money we are spending over it, we will have to admit that we are not devoting much of our money to the development of these vital problems of research and development of science. I do not want to quote figures, but if we compare the money that we are spending on various items, we shall have to admit that compared to what we are spending say on defence or other branches of the Government, what is going into the development of education and scientific research is very meagre. Only a couple of days back, we were discussing the report of the University Grants Commission. There we found that the total provision for the second Five Year Plan has been of the order of Rs. 27 crores. There also the Education Minister said that most probably all that money may not be forthcoming. So, that is a measure of the attention and care that we are bestowing on developing our educational and scientific research institutions.

Having said that, I would like to point out that as regards the scientific man-power that is available, we are not making very earnest efforts to develop it. Here I would refer to the Estimates Committee report for

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the year 1957-58 on technical education. They say:

> "In respect of post-graduate course, the committee understand that there were only 94 students on the rool of the institute—i.e. the Kharagpur Institute—in the year 1957-58 as against the modified capacity of 600 seats."

You will find that provision was made for 600 seats, but only 94 students were there and the gap between the actual accommodation made and the students taking advantage of it was very big. Then, on page 6, they again point out:

> "The Committee notice that during 1956, the number of students in each of the following post-graduate courses did not exceed a couple of students."

The table given there is very revealing and also discouraging: Transportation Highway Engineering—only 2 students; Technical Gas Reaction and High Pressure Technology—only 2 students; Machine Design—2 students; Applied Botany—1 student; Farm Machinery and Power—1 student; Industrial Physics—1 student; Meteorology—1 student. I do not know how this shortfall which is expected by the committee that was formed to look into the engineering personnel is going to be made good. They have warned us that by the end of the second Five Year Plan, there will be a shortfall of about 1,800 engineers, about 8,000 diploma-holders and so on. I do now know how we are going to train these personnel which we want very badly today for the proper development and fulfilment of our Plan. There is one more aspect to which my hon. friend just now referred and that is the non-use of the available talent that we have. He pointed out that many scientists are becoming politicians. I do not want to mention anybody by name but I would like to say that when we are thinking of expanding our scientific research and scientific work, we must see to it that these scientists are confined to their work itself, that they are given the largest possible freedom and scope and that they are not sucked into this political vortex. I do not know whether all of them are tempted to enter politics, but I know this much that the top scientists are burdened with so much administrative work that they must be getting hardly any time to devote to their own work.

I do not know what the experience of people like Dr. Bhabha is. We say that he is one of our outstanding scientists and yet I am afraid he has to do so much other work, taking round eminent persons, visiting foreign countries, holding conferences and all that that I wonder how far he will be doing justice to the talents that he possesses. It is just like an Einstein being made the head of some technological institute and being asked to examine candidates, make appointments, file reports every week, just destroying the talent that he has. So, I would request the Government that if they really want that the scientists should devote all their energies to scientific research, they should be kept aloof from these things and they should be released from this burden.

The third point I would like to mention, which had been referred to last year by the Prime Minister as well as late Shri Tyabji, is this. They had pointed out that many of our eminent scientists who are abroad refuse to come back. I think their number runs into hundreds. I think something must be done and some sincere efforts made to get these people back. I think if we appealed to their patriotism and also assured them that they will get the pay they are getting abroad and the opportunities that they are given abroad, they will respond to our call and they will come back. So, I would suggest that first of all, the scientists that we have should be relieved from all the administrative burden; secondly, we should try to coach as many of our young men and women as possible as in the scientific pursuits and thirdly,

let us try to recall as many of our scientists back home as possible. These are the few things that I would like to place before this House for its consideration.

15 hrs.

Then the next point that I would like to stress is that this scientific attitude of mind must be cultivated from the very beginning. I recall, when I was in school I found that science at that time was not given any place of honour at all. The main things that they would concentrate on in high schools was Sanskrit or mathematics and a lot of time was given to English. English came first and Sanskrit and then mathematics, then a lot of history; geography was completely ignored and science lessons were completely neglected. They were not a subject for the SLC examination.

Now, this attitude will have to be changed and we shall have to see that love for science is inculcated in the minds of our young men and women from the very start, from the primary stage of education. This can be done by stressing not only the need of science but the beauty of science. Sometimes we take the attitude that science is only a useful subject. It is not so. When I am told by some eminent astronomer as to how the stars behave, how many stars are there, how many are yet to be discovered, what is a galaxy, what is the nebula, that appears to me to be more romantic, more full of adventure than a story of detectives and thieves. This sort of attitude will have to be cultivated in the minds of our young men and women if you want that they should take to science.

I would also point out that Universities can do a lot in this matter. I remember that when I was a member of the executive of the Poona University, we tried to argue with All India Radio that we would like to set up a radio station, not to broadcast light music or to broadcast some film music, but for some other noble purpose. We wanted that scientists, historians, philosophers, economists etc. should speak on the radio and that knowledge should be broadcast to all the people who were not fortunate enough to attend the University. Of course, the request was duly turned down, and the All India Radio told us that because it happened to be a monopoly of the All India Radio, no University can be given a licence like that.

Now I would like to plead with you that Universities can do a lot in this matter they can arrange for extra-mural lectures, they can arrange for broadcasting to students, they can arrange for tours and all these things will be able to create a sense of scientific values.

I welcome the Scientific Policy Resolution, not only because it will make it possible for us to fulfil the Plan, but because it will bring about a change in the mentality of our people. I am very much disgusted when I find people still harbouring some age-old faiths, age-old attitudes which are contrary to the demands of the day. Therefore, when we want that the Scientific Policy Resolution should be adopted in this House, it is not enough to adopt it here. But it must be presented to the people, the outlook that it contains must be carried over to the people and a whole generation will have to be raised, which believes in the tenets which are incorporated in it. These are the observations that I wanted to make, and I am grateful to you for giving me this opportunity.

Shri H. N. Mukerjee (Calcutta-Central): Mr. Speaker, Sir, I welcome this Scientific Policy Resolution which has been placed before the House, and I welcome it even though I would have been happier if this kind of resolution had been formulated by Government earlier. It is a precisely-worded, suggestive and important document, and we are happy that now there is a definite statement by Government in regard to the harnessing of science to the task of reconstruction of life and society in this country.

[Shri H. N. Mukerjee]

It goes without saying that if we are going to have in our country a socialist form of society, we have to place the highest emphasis on the role of science. We learnt long long ago when there was nothing to change the view that good life is a life inspired by love of man for man. But, at the same time, it has to be guided by knowledge. Therefore, the employment of science for the re-making of man is something which is absolutely essential and it is without doubt the first premise of socialist construction. As my friend, Shri V. P. Nayar, stated earlier, it is no mean accident that a socialist country has blazed its trail into cosmic space, and we know very well that if the United States of America, which has made stupendous technological advance, had gone socialist, it would have produced miracles of achievements and there would have been no subordination of knowledge, which is power, to the individual self-interest and greed of particular individuals or groups, and the results would have been magnificent.

We are always happy that the Prime Minister himself takes great interest in the development of science in this country. He is a regular visitor to every session of the Indian Science Congress. And it is in the fitness of things that it was he himself who placed the Scientific Policy Resolution before our House.

I would like to say, to begin with, that even though I consider that the construction of a chain of national laboratories is one of the remarkable achievements of Government, at the same time, with all due respect, one can be impatient with the results so far achieved, as far as we know, by the national laboratories. I had occasion sometimes to find out certain facts, as they were reported to me, about the working of certain of the national laboratories, and it did appear that proprietary interests working by device methods were hampering the utilisation of many research finding, particularly in the realm of petroleum and rubber industrial requirements. We had also heard about many of the grievances of the scientific personnel, but that is another aspect of the matter to which I hope to be able to come a little later.

I would like, therefore, Government to announce that they shall have a conference of scientific people, and perhaps also with a few sprinkling of lay personnel, who would review the work of the national laboratories in the light of the present needs of our Plan, as well as the needs of fundamental research. I feel this is very necessary and that I say with all respect to the work that is being done by our eminent scientists.

In regard to the jobs of day to day interest which remain to be done, I feel that the scientists of our country have a great deal to contribute in addition to what they have done so far, to the solution of some of our important problems. We have, for example, the problem of food and the Prime Minister has told us very often that by certain effort we can have an increase of the production of food in our country by as much as 25 per cent. My hon. friend, Shri Asoka Mehta, probably differs from that, and that for very understandable concrete reasons. But I am inclined to agree with the Prime Minister that if a certain emphasis is put on social and economic policies, as well as on the application of the results of technological research to the tasks of our food production, then we would not have to look abroad for the morsel of food for which our people so much endeavour with so much hopeless effort to fill their bellies.

I saw only the other day the report by an expert from the United Nations Food and Agriculture Organisation, who is now attached to the Government of India as Adviser, Mr. F. B. Carbasier Weber. He toured the hills and plains of Assam to see for himself the present state of agri-horticultural

development in the State. He says, among other things, that out of 24 million acres of arable land available in Assam, only 25% was under cultivation. The whole food problem could be solved if all the cultivable land in Assam would be made to yield food crops. He says a great deal more. I know in another region, like the Sundarbans area in West Bengal, if only certain technological measures are adopted, which are particularly not difficult for our country to negotiate, I am sure we could have the granary of the north-eastern part of India in that area. But, I find that there is not that kind of purposive application of knowledge in order to achieve that kind of production in the realm of food without which the Plan will founder. All our prognostications about the future might end in something like despair.

Then, to turn towards the problem of health. We know now that at the moment a city like Calcutta, the largest in the country, is in the grip of cholera epidemic. It is amazing that in the second half of the twentieth Century in a city which has been the second greatest city the British Empire of the past and is now the largest city in the Indian Union, we find a cholera epidemic raging. It does because the water supply, system of that city is so very defective. There is unfiltered water supply to augment the supply of filtered water and the result is contamination. Apart from that there are so many other causes—slums and all kinds of other things, but I need not refer to all that.

Small-pox again is another scourge with which we are accursed and if we only had, what my hon. friend, Shri Goray, said the scientific mentality and at the same time if we had the Government intervening effectively to help the people acquire that scientific mentality, then surely these avoidable scourges could be eliminated from our country. Actually, I find that research is largely discouraged in our country as far as medical work is concerned. Perhaps, something is being done now in the Drug Research Institutes, but the Calcutta School of Tropical Medicine, for example, which has been doing a great deal of work and is known all over South-East Asia for the very valuable contributions its research departments have made, is starved. I have talked to the Director of the Calcutta School of Tropical Medicine and he says that he is between two stools, the West Bengal Government and the Government of India, and neither has anything but a very stepmotherly attitude towards that institution. We have not had a Lister or a Ronald Ross. We produced a Brahmachari or a very few people but we can hardly name very few people who made original contributions. We have superb surgeons. We have wonderful physicians. But they are too busy with their practice or administrative jobs. There are a few exceptions who command respect. I have nothing but the uttermost respect for them. But, by and large, on the whole as far as the picture of health is concerned, it is very dismal.

Then again we find that there was some expectation that the National Laboratories would do some jobs which would help the day to day life of our people. But as far as I know the most publicised product of the National Physical Laboratory has been the solar cooker. Perhaps fiasco will not be too harsh a word if we have to use a word in regard to this particular solar cooker. I do feel that so many other things could be done.

Only the other day I was looking at the journal *Kurukshetra* of April, 1958—last month's journal—and there is an article on cow dung gas plant. I remember the hon. Prime Minister saying some time ago something about our living still in the cow dung age. But actually it is a fact, as Dr. Bhabha has estimated, that 75% of the total energy requirements of our country comes from the burning of cattle dung. So, whatever the metaphorical implications of the cow dung age, practically speaking, cow dung is

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extremely important for our present purposes and we cannot overcome those purposes unless we make very special efforts. There are two conflicting aspects—burning cow dung for fuel purposes and using it for manuring of crops. These two purposes ought to be reconciled. For this purpose, I understand, for 17 years research has gone on and in 1954, there had come the design of a cheap and simply operated plant. I read here:

> "The cost is about Rs. 350 for the installation of a plant sufficient for a family of five members. The idea is that it would be installed in the houses of farmers in twelve villages around Delhi.'

This is a kind of thing which should not merely be a kind of kite flying specimen of oven. It should be pursued properly and after 17 years of labour surely something worth while, I hope, has turned out. This is something which would revolutionise the entire picture of life in our country.

Then, again the hon. Prime Minister had said that we live in bullock-cart age. In his many speeches he has said it. But it is a fact that we have these bullock carts. I had read somewhere some time ago that if we have rubber tyres attached to these bullock carts, then they would go much faster and the roads would not be rotted and ruined as quick as they are. Therefore something perhaps might be done about it. It does not require high-falutin research. It requires only a purposive application of knowledge to the facts of life.

Then, the hon. Prime Minister has been saying, which I have quoted with approbation in my humble fashion, about the P.W.D. mentality being shown by ministries in his Government. The other day talking about the University Grants Commission I referred to this matter. I find from the Budget papers that there is a low cost housing expert attached to the Education Ministry. Possibly there are many low cost housing experts attached to the Works, Housing & Supply Ministry, but I do not quite know what they do. Hardly any progress has been made in finding out substitutes for steel and cement and I wish the hon. Prime Minister to say that we shall have for 20 years a moratorium on prestige building. There is no need for it. I was seeing the other day the mausoleum-like structures which are put up—the multi-storieyed buildings, which in this wonderfully sunny country of ours keep out the light. The inner recesses are gloomy and dark. There is air-conditioned comfort provided only for the fortunate few. We have no need for this kind of thing. Of course, occasionally we want permanent structures. But if in war time the British could construct all kinds of hospitals with very perishable material which would last ten years or more, why can't we have a scheme for 20 years or so, so that we have our schools and colleges and hospitals of some sort, not very well efficient and specialised hospitals perhaps, but at least workmanlike hospitals which could be housed in this kind of building?

Then, I refer to a matter, which, I hope, I would be forgiven for. The other day there was a question in the House on the 2nd April, 1958, when an hon. Member asked whether the recommendation of the Commissioner for Scheduled Castes and Scheduled Tribes for stopping immediately the practice of having night soil carried on heads in backets and buckets has been pursued properly. And the answer was:

> "Yes, the State Governments have been asked to submit schemes for the supply of hand-carts or wheelbarrows to scavengers employed by municipalities and other local bodies...."

and a princely sum of Rs. 39,000 has been sanctioned to the Government of Orissa for this purpose. I remember having read somewhere Acharya

Vinobha Bhave saying that if we are going to have a country which our people would think of as their very own, what are we going to do about them? What are we going to do about the lowliest of all? He talked about scavengers who still carry human excrement on their head. We are talking about scientific achievement. We are certainly proud of whatever scientific achievement is to the credit of Indians, but it is almost pathetic for us to talk about scientific achievement when this kind of thing happens and when the Government says, without turning a hair, that Rs. 39,000 have been sanctioned to the Government of Orissa, so that human beings might, perhaps some of them, be saved from the indigenity of carrying the excrement of fellow human beings.

I feel, therefore, that first things should be put first. Surely, we want fundamental research. I shall be the first man to champion the cause of fundamental research. Any amount of money which Government needs for fundamental research would be granted by this House with the greatest willingness, but at the same time certain things should be done here and now. Science could help to perform the irksome errands of Indian humanity which has borne the burden of sorrow and toil for much too long, and they cannot do it much further.

Also, apart from the report of the Estimates Committee to which reference has been made and I shall not repeat it, in regard to geology for example, I read a report about what is happening in China, how the students, young men and women, are going round the country, and they are prospecting all over the place. They have a new enthusiasm; a kind of exhilaration has overtaken them. We want something of that spirit. I know that spirit cannot be manufactured just like that. But after all you have to make an effort. A plan cannot succeed unless we have the atmosphere in the country surcharged with inspiration, and our young men and women can go round and collect facts which will help the Geological Survey. I know the Geological Survey of India is ridden with jealousies and suspicions, and I know at the same time that there is great doubt in regard to the technical competence of many people who are at the head of many of our scientific departments. But at the same time, if you want to change it, you have to try it from a different way and in a different fashion, and it is good that the Scientific Policy Resolution is suggesting something like a way out.

Some time ago in January this year, Professor P. C. Mahalanobis made a speech as President of the National Institute of Sciences, and he pointed out that engineers per million of the population were being turned out every year by the U.S.A. at the rate of 158, by the Soviet Union at the rate of 355, by the United Kingdom at the rate of 55, by China at the rate of 30·9 and by India only at the rate of 9·4. Now, this is a very very dismal picture which Professor Mahalanobis himself has drawn, and I wish the Prime Minister gives his mind to it and asks the Departments to sit up and do something about it.

The other day in answer to a question we found out that some 500 graduates and diploma-holders in engineering had their names enlisted on the employment exchange records. This is most amazing. We are told on so many occasions that engineers at least enjoy the opportunity of full employment. But here in this House we heard about 500 engineers, qualified engineers, being without a job.

Then again, in regard to Statistics which is the Prime Minister's particular pigeon, if I may put it that way, lately there has been a great deal of allegations about the lack of co-ordination—it is no worse than that—lack of co-ordination between the requirements of Government and the working of the Indian Statistical Institute. The publication of much of the work which was commissioned—and the charge was taken up by the Indian Statistical Institute—has not been done.

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We see also that the Statistical Institute workshop has imported equipment worth some two million rupees. But the report is—I am quoting from *The Statesman*, Calcutta edition of 11th April, 1958, a special report—the report is that this workshop in the Statistical Institute has not produced a machine since its inception. And the Institute pays more than Rs. 10 lakhs as rental for these machines. Now, machines to make machines are there and, according to this report, we are paying Rs. 10 lakhs every year as rental for these machines, but the machines which should have been built by those machines are not yet forthcoming.

There are many other things which could be said, but it is not necessary to do so.

The other day also, the Prime Minister told us in answer to a question in regard to the desirability of appointing Scientific Attaches or liaison Officers in our Embassies and establishments abroad, that there were not adequate people to man this kind of jobs. I found in *The Statesman*, Delhi edition of yesterday that the Council of Scientific and Industrial Research has lately published a list of Indian scientists abroad. It is not complete, but even in the incomplete form it says that there are 77 scientists, 21 technologists and 143 engineers who are abroad. So I do not think it is shortage of personnel which prevents the appointment of Scientific Liaison Officers abroad. On the contrary, these people perhaps do not want to come home, because the prospects here are extremely bad. The prospects here are so bad—the pay conditions in the Council of Scientific and Industrial Research are very unfortunate—that the grade of the Junior Scientific Assistant, who is an M. Sc, is lower than that of an Assistant who is mostly a Matriculate and who goes ahead and gets promotions more or less normally.

We find also that in the staff of the Council of Scientific and Industrial Research there are many gaps and lacunae which ought to be filled. There was a letter recently in the Press showing how officers high up in the Council of Scientific and Industrial Research are appointed who have no technical qualification whatever but who at the same time represent the C.S.I.R. in discussions, in seminars on matellurgy in Jamshedpur and such other places. I say, therefore, that there are many paradoxes in this country which we ought to resolve and remove.

There is one paradox which comes to my mind now, and that is that in most of the hospitals in our country—I can say with confidence about the City of Calcutta—in the hospitals they operate, but the operation theatres are not air-conditioned. You find eminent surgeons performing operation for three hours at a stretch, perspiring like anything, and it is not air-conditioned. But you go anywhere in Delhi or Calcutta or Bombay or any other place where the moneybags gather, and you find not only in government offices but also in private residences air-conditioning takes place. Now, where is the policy of the Government? When in the hospitals the operation theatres are not air-conditioned, why should this House be air-conditioned; why should so many other places in government establishments be air-conditioned; why should the residences of individual moneybags be allowed to be air-conditioned?

Sir, I am concluding in two minutes. I shall refer to a matter to which reference was made also by Shri Nayar and, I think, also by Shri Goray, that it is really unfortunate that many of our top scientists are becoming administrators. I do not know, Sir, why one of our very foremost scientists, who has only lately got a Fellowship of the Royal Society—he should have got it thirty years ago or more—I do not know why he should have been shunted off to be the Vice-Chancellor of a University where there is no facility at all for scientific research. It hap-

pens. The other scientist, the Indian scientist who has got a Fellowship of the Royal Society this year happens to be the Chairman of the Board of Secondary Education looking after the School Finals examinations! There is no point in this kind of thing. Maybe some scientists want administrative power. Maybe on occasions it is necessary for scientists also to be administrators. The Resolution says that a scientist should be given a certain status, they should participate in the formulation of policy. But by and large, the real scientist, the researching scientist, should not submerge himself in administration.

Sir, I am quoting from what was said by Dr. C. V. Raman the other day; he was felicitated in Bangalore on the eve of his departure to the Soviet Union to receive the Lenin Prize. He said, that in other countries men of science were working hard; without hard work nothing could be achieved. And then he said, "The one ambition of a man of science should be his loyalty to science to the last". Now, it should be said, of course, that one has to live and one has to carry on from day to day. Therefore, provide better facilities for the scientific worker, but do not let this idea get into the minds of our scholars and scientists that they would get as much money and as much administrative power as X or Y or Z. After all, money is no criterion as far as capability is concerned. There are other criteria, the judgment of one's fellows, the sense of devotion and dedication to the country. And if our scientists do not have that feeling, who else will? The scientists will have that feeling only when real provision is made for the betterment of the scientific personnel at different layers and when proper opportunity is given to it. At the same time let them not be duped and lured away from the realm of research to departmental desks and all that kind of thing. That is happening so very often that we ought to stop it.

I want to suggest that for purposes of better working of the Plan the National Metallurgical Laboratory may be connected with the Steel, Mines and Fuel Ministry, the Laboratory for Leather may be linked up with the Commerce and Industry Ministry and the Laboratory for Ceramics may be linked up with that Ministry, so that you can divide it, so to speak. And the more theoretical Laboratories which do theoretical research work may be linked up with the C.S.I.R. Otherwise there is a great deal of delay which could be prevented.

I shall say in conclusion that a very delicate appreciation has been rendered to this country and a gesture of tribute has been made to this country by a great scientist, Prof. J. B. S. Haldane who has come to live in India. He is working in the Statistical Institute at Calcutta and he desires to become an Indian citizen. It is a great thing that such a scientist looks upon India as a sort of a hope of the world in a way and it is important that we try to reciprocate that gesture.

What Shri Goray said, I fully substantiate. There is a certain cheap transcendentalism which comes easily to us. I know that we all have great respect for our ancestors and for the sense of detachment which they gave us, we have very great appreciation and respect. There is no doubt about it. But, if that transcendentalism and sense of detachment comes a little too easily and we run away from the tasks of this world, that is certainly not interpreting the legacy of our past. What we usually do is, to place some flattering unition to our souls in order to defend ourselves against the chill blasts of misery and degradation. The temper of science, as the Resolution says here, adds to man's material power as well as extends his mental horizon. If we can get our children to develop that spirit of curiosity, to have that passion for knowledge and that devotion to the acquisition of knowledge which would become power to change the facts of life, then and then alone shall we be

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in a position to implement the provisions of our Plan and rebuild the country the way in which we all wish to do. That is why we welcome the Scientific Policy Resolution and we desire that positive and concrete efforts are taken to implement it in the proper spirit.

The Minister of Scientific Research and Cultural Affairs (Shri Humayun Kabir): Mr. Speaker, I am very glad to find that in spite of minor differences on details, all Members of this House have taken a national attitude towards what may be called a national Policy Resolution. Some hon. Members referred to the fact that this Resolution should have been passed many years ago. That is a matter on which there may be room for debate. In a way, this Resolution only states in clear and unambiguous terms the policies which have been adopted by the Government, at least since Independence. It is a fact that before 1947, even though we had scientific and technological institutions, there was no national policy about them. But, after the country became free, one of the first acts of Government was the appointment of the Scientific Man-power Committee in 1948. If I am not mistaken, this was the first time that a committee of this type was appointed in an Asian country. Perhaps I might go further and say, there are not many countries in the world which have a Scientific Man-power Committee to go into the question of scientific and technical personnel, to assess our requirements and frame a definite policy resolution as a result of such investigations.

The Scientific Policy Resolution which has been placed before the House by the Prime Minister on the 13th of March is also, if I am not mistaken, perhaps the first time that in any country, a definite policy resolution of this type has been placed on behalf of the Government before Parliament in order to indicate the attitude of the Government and the people of the country towards scientific progress.

I do not wish to enter into a detailed analysis of the various points which have been mentioned in the Resolution because the Resolution is clear and unambiguous. I would like to deal only with one or two points which have been raised by some hon. Members who spoke just now.

My hon. friend Shri Goray referred to the fact that in India we have always been transcendentalists. My hon. friend Shri H. N. Mukerjee has always veered from transcendentalism of one type to another and has probably been a mystic in many fields; he will remember the many occasions when we have discussed our mystic attitude towards things or the lack of it. He also referred to this easy way of avoiding the realities of life. I do not think it is quite correct to speak of India in this way. In the days of India's glory, there was a scientific attitude here. If I think of Agastya, one of the most eminent seers of this country,—

Shri Goray: I talked about the last 2000 years.

Shri Humayun Kabir: Agastya was not more 2000 years ago as far as we know. In any case, he was one of the most important figures of ancient India. The two things which we remember about him are what I would regard as two great engineering feats. One is the conquest of Vindhya by which I take it, nothing more is meant than the fact that he established communication between northern and southern India. The other is the drying up of the sea. He is supposed to have drunk the sea in Kerala. My hon. friends from Kerala will perhaps agree with me that when he drank up the sea, what he did was merely to drain the sea, and provide conditions in which Kerala became habitable for all our friends, those who agree with us and those who do not agree with us.

Generally, as hon. Members spoke, there were three points which they emphasised again and again. I found also a certain amount of inconsistency

in the approach of some hon. Members, and sometimes an inconsistency in the approach of the same hon. Member in different parts of his speech. The hon. Members said that our scientists should have nothing to do with administration, that they should be there merely to give advice when it is asked for. There is an old phrase whether the experts should be on tap or experts should be on top. If we want that our scientists should be there only to give advice when they are asked to give advice, I think we would miss the very spirit of the Scientific Policy Resolution. In the Scientific Policy Resolution, it is clearly laid down that we want our scientists in India not only to carry on researches as they must, if advances in science are to take place, but they must also have a share in the framing of policies on national life in all its dimensions. That is more necessary in the modern world where science is impinging upon life in so many different ways. Today science touches on life, opening out such opportunities that unless scientists are in touch with the different aspects of life, we may not always get the best possible results.

My hon. friend Shri H. N. Mukerjee also started with his distrust of the scientists being in charge of some of the departments but he also objected to the fact that in certain cases, some of the laboratories or some departments of the Council of Scientific and Industrial Research are represented by people who are not scientists. First he wanted scientists to be aloof from administration, later on he said that the scientists must also have a say in the policy. How can you reconcile the two statements? If they have to have a say in the policy, a certain amount of administrative duties will be inescapable. If they take upon themselves a certain number of administrative duties, they will, to that extent, be helping to guide the researches of others, but they will themselves be probably drawn away from their individual researches. But, this is a problem which is not peculiar to India. This is a problem which you find in all the advanced countries of the world today. A man like Dr. Oppenheimer had to be pulled out from the actual researches in which he was himself engaged in order to undertake a great military project during the last war. A man like Dr. Teller, again a great scientist, has recently been pulled out of his research laboratory in order to organise research for certain purposes. We may or may not approve of the purpose, but the fulfilment of the purpose demands the participation of the scientists. Take again some of the scientists of the Soviet Union. They have also administrative duties and they have very heavy responsibilities. One of the things that struck me when I visited that country was that most of the people at the top were experts in their own fields. If we want experts to run the administration, experts to shape the policy, we cannot avoid the kind of situation which is developing in this country, where a man like Prof. Satyen Bose may be called upon to look after the affairs of Viswa Bharati or a man like Dr. Bhabha may be called upon to organise scientific research and atomic research in this country.

I do not deny for a moment that the main job of the scientist is to carry on researches, to advance the frontiers of human knowledge and in this way add to the sum total of knowledge which has come to us from the preceding generations. At the same time, we have to recognise that in certain moments of national emergency, certain people are called to certain tasks and whether they like it or not, they have to fulfil these tasks. That is the phase through which we are passing in India today.

There were references by Shri V. P. Nayar to the fact that the national laboratories do not take up questions which are of immediate importance to

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life. My hon. friend Shri H. N. Mukerjee also referred to the fact that fundamental research has not been carried out as effectively as desirable and many problems still await solution. Now, he of all persons should know that in the matter of research, whether applied or fundamental, no one can lay down a time-table. Many people work and they work silently and they work through long years. Then suddenly the frontier breaks somewhere, and there is advance all along the line. It is in this way we get a new insight of truth, of knowledge and great results follow. It also very often happens that when there is a scientific discovery, we do not at first realise immediately the implications of that discovery. The practical implications may not be very clear to even the minds of the scientists. I would plead with my hon. friends opposite that if the laboratories have not always been able to give spectacular results, we have to be patient with them. We have to be patient with the scientists, we have to create the conditions and the atmosphere where they can carry on research and their work. If such an atmosphere is created and if they continue their endeavours with devotion and dedication, there is no reason why magnificent results should not be forthcoming.

Take some of the most advanced scientific countries of the West, or take the Soviet Union. They have been carrying on research for a long time, and yet till perhaps ten years ago, people used to say that they had not produced any great indigenous scientists of their own. They were depending upon the scientists who came to them from other countries. This is a thing which used to be said even of the USA. It is only in the last ten years or so that the USA has been producing indigenous scientists, scientists who are their own products. Till recent years, they had depended very largely upon the work of scientists who came to the United States either from one of the European countries or some other part of the world. In the field of scientific research, it is simply not possible to lay down any specific time-table and to say that we must have results at a particular time. We can only create the conditions, and I would like to say that ever since the attainment of independence, the Government has been doing that all the time.

My hon. friend Shri Mukerjee made a reference to the personal interest which the Prime Minister has been taking in the matter of the development of science in this country. The Prime Minister has attended every single conference of the Indian Science Congress, and apart from that, his general interest has been an indication of the interest which the Government and the people take; and even more than that I think the fact of his constant and steady attention to scientific problems has attracted the attention of the many administrators all over the country and also of the public throughout the country to the importance of science as an instrument of national policy.

My hon. friend, I think it was Shri Mukerjee, asked: why is it that problems like the problem of food, the problem of health, the problem of dealing with some of the types of menial work which is degrading to human dignity, are not dealt with by the scientists? I would plead that all these things are being done. The Scientific Policy Resolution also lays down clearly that one of its purposes is to direct attention to such problems. Whatever deficiencies of various types there be, whether in raw materials or in skills, can be overcome by the training up of scientists, by the invention of new devices and by the manufacture of machines which may take away the stigma of degrading work. I have no doubt in my own mind that when scaveng-

ing becomes a completely mechanised process, when it is done completely by means of machines, a lot of the stigma which attaches to that profession today will automatically disappear. It will also become far better paid, so that economically and socially also the people who adopt a profession like that will occupy a much higher position. In all these matters, the Scientific Policy Resolution is merely an indication of the constant endeavour of the Government to attract the attention of the people to these problems, to these endeavours, to these efforts, by which this country is trying to overcome the gap, the deficiency, of thousands of years.

I would agree with my hon. friend Shri Goray that for the last 1,000 or 1,500 years our scientific progress has been inadequate. In fact, I have often felt that one of the reasons for many of our political, social and other ills was the loss or decay of the scientific spirit. At one time, the Indian spirit questioned everything. If we go through some of our ancient classics, one of the things which strikes us most vividly is the way pupils asked uncomfortable questions of teachers. There was nothing sacrosanct; everything was subject to enquiry, everything was subject to scrutiny, everything was subject to doubt. And yet, in the course of the last 1,000 or 1,500 years an attitude of mind grew up in this country where we forgot questioning, we forgot doubt, we forgot enquiry, and that resulted not only in decay of science, but led to ossification in social attitudes and led to deterioration in economic matters. The whole world went forward and we were left behind.

The Government, since independence, is naturally trying to overcome that gap, these handicaps, but we cannot expect that the deficiencies of thousands of years can be overcome in a mere ten years.

There were also references made to various kinds of shortages in personnel. I know and every Member of this House knows that we want more scientists, more engineers, more technologists. I would like to place before the House very briefly the efforts which are being made to overcome these shortages. I will give only one or two figures.

There were only 3,000 admissions a year to the engineering and technological courses in 1947. At present the number is 10,000 and the number will be about 13,000 by 1961. In the case of diplomates, not degree-holders, there were only 4,000 who had admission every year in 1947. The number today is 16,000. In ten years' time it has increased four-fold, and in 1961 it is expected to be 25,000. This is evidence of the effort that is being made. I am not for a moment suggesting that we have any reasons for complacency. With an expanding economy and the way in which science is entering into every sphere of our life, we shall be continuously needing more and more scientists and technologists. I would only say that steps are being taken to meet the need and assure that a scientific temper be created in the country.

Hon. Shri Goray said, or perhaps it was my hon. friend Shri V. P. Nayar, that science is not taught in the secondary stage. That was true in the past, but is no longer true. In the new courses which are being devised in Secondary Schools, general science is a compulsory subject.

Shri V. P. Nayar: I did not say so.

Shri Humayun Kabir: I must also confess I do not quite understand why Shri Goray objects to the instruction in mathematics. He seems to complain that mathematics, Sanskrit and English were the only subjects taught. I think English also is necessary and important for the advance of science in this country, but whatever be our attitude towards English, with regard to mathematics I simply do not understand why he had any objections or

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doubts. I think it is recognised on all hands that no science can advance without the application of mathematics. If today in India we have any one field where we want development and progress in a much more marked degree, it is the field of mathematics. If our mathematical equipment in all the different sciences and different faculties is improved, it will have an immediate impact on the general development of science.

I do not wish to take any longer the time of the House, especially as the Prime Minister will be dealing with the general questions of policy, but before I sit down, I would like to mention three things which I feel ought to be done and are being done as much as we can within the limitations under which we work.

The first is to advance fundamental research. Here I think all Members of this House will note with pride that some of our scientists have contributed to fundamental research in a manner which has brought not only honour to them individually but also brought honour to our country. They are in the forefront in physics, in mathematics, and in spite of the many disabilities under which this country has suffered, in the field of fundamental research this country has been among the progressive countries of the world.

The second thing is the question of applied research. A suggestion was made by my friend Shri Mukerjee that applied research is not sufficiently effective, and towards the end of his speech he suggested that this may perhaps be rectified if the different laboratories are attached to the different Ministries. I would suggest to him that every laboratory should have, and of course, has, very close relations with the Ministry with whose problems it deals. But, at the same time, the Council of Scientific and Industrial Research is there to coordinate research in the different departments. In the case of applied research, co-ordination is of great importance, and of even greater importance in a country like ours because with our limited resources in manpower, in finances and in equipment and material, it is essential that there should be no duplication, there should be no wastage. Therefore, the laboratories have to be linked up with the Council of Scientific and Industrial Research if there is to be coordinated advance all along the line.

Finally, I would agree with my friends Shri Goray, Shri Mukerjee and Shri Nayar that we ought to have a more widespread scientific outlook among the people.

Shri C. D. Pande (Naini Tal): He is a professor of history.

Shri Humayun Kabir: They are all professors in a way.

Shri V. P. Nayar: I am not.

Shri Humayun Kabir: You have been professing a lot, and we can give you the honorary title of a professor!

I was speaking of creating a scientific outlook among the people and the role *vigyan mandirs* can play. The purpose of these *vigyan mandirs* is to bring science within the reach of the common man. These *vigyan mandirs* are to be established in rural areas, in community project and national extension service areas so that not only certain scientific services are brought within the reach of the common villager, but more important still, these *vigyan mandirs* may help to develop a scientific outlook among the people.

I am glad to find that we are all agreed on fundamentals, in spite of minor differences here and there. Some of the criticisms were, if I may say so with all due respect, not fully informed. I have no time to go into the details, but some of the figures given by Shri Mukerjee were not quite accurate. If he went into the

figures in greater detail himself, he would have found out that the information he has is not reliable. But I will not go into those details at this stage.

I welcome the general support for the Scientific Policy Resolution, and I am sure that all sections of the House will unite in creating a temper in this country where scientists can work in an atmosphere of honour, dedication and service to the nation and the world.

Shri Naushir Bharucha (East Khandesh): The purpose of the Scientific Policy Resolution is, firstly, to crystallise what attitude Government have towards scientific development; secondly, to focus the nation's attention on the importance of scientific research; thirdly, to affirm Government's determination as to the positive steps they will take for the acceleration of scientific development, and lastly, to assure the scientists that they will have an honoured and secured place in the country.

It has been my experience that often resolutions are placed before the legislatures, which are very well-worded, and very good in their intentions, but subsequently nothing is done to implement them. I do hope that this resolution will not go the way so many other resolutions have gone.

It is correct to focus the attention of the nation on the fact that while we are developing Ambar Charkha, our scientific development is not restricted to that; we understand that both Ambar Charkha and cow-dung fill a very important place in our economy, but at the same time, we are not unmindful of other sources of power and other aspects of industrial development. Therefore, Government state that our scientific policy will be to encourage science on all fronts.

In the various items as to what Government will do in order to foster, promote and sustain the cultivation of science, we find some specific steps. Take, for instance, item (iv) which reads:

> "to ensure that the creative talent of men and women is encouraged and finds full scope in scientific activity;".

The first point is that if you really desire to promote scientific development, you have got to hunt for scientific talent. It is futile to expect that you will discover somehow or other scientific talent without making a determined effort. For instance, when artists are sought to be discovered either for television or for broadcast or for the cinema industry, what actually happens? People go out hunting for them. I ask whether some such device cannot be created here, and whether a separate department cannot be created for finding out scientific talent in this country.

For example, during the war-time, it was very necessary to see whether, if there was any invention which was calculated to be useful for the promotion of the war, even if it was in any corner, it could not be discovered and harnessed to the service of the nation. What did Government do then? They created a committee which examined the scientific inventions of any citizen placed before it. The result was that thousands of useless suggestions were made, but out of those thousands of useless suggestions, tens of them emerged as really useful. It may be that we have got to devote too much time to discover talent. But when we discover talent, we shall find that it is really useful and worth the while to waste time on thousands of other proposals.

Suppose you find that there is a student who has a scientific trend of mind, and of outstanding talent. What happens to him? Today, he is crushed by the fact that he is poor. He has got no school fees to pay. And whatever his talent, he has no opportunity to pursue the trend of his mind that he naturally possesses. Why does Government not declare that in a

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college, where there are really capable students, ten or fifteen students, may be, who can be really developed into good scientists, the responsibility of maintaining, feeding, clothing, providing education and securing service for such people would be completely taken over by the State? If the parents are completely freed from that responsibility, I think you will get a large amount of talent, which otherwise goes to waste. It goes to waste because the parents are too poor to enable the boy to go in for higher education.

Let this matter be included in our scientific policy statement that wherever any student is found in any college, who has really a touch of that genius which scientists possess, the State will be completely responsible for his entire education, feeding, clothing, maintenance etc., and even secure him an employment after he has passed the necessary tests. Only if some such assurances are given, will you find that talent. Otherwise, how are you going to hunt for the talent; how is the progress going to be maintained unless you first discover the talent? So, I submit that this is a useful thing to which Government might pay some attention.

There is one point with regard to the policy, about which I am a bit doubtful. It says:

> "The Government of India have decided to pursue and accomplish these aims by offering good conditions of service to scientists and according them an honoured position, by associating scientists with the formulation of policies,....".

I do not quite agree there. Formulation of policies must necessarily remain the responsibility of those who are at the helm of the administration. If 'by associating scientists' merely means 'consulting the scientists' it is a different matter. But to give them a share in formulating policy, which is the responsibility of this House, or, for the matter of that of the various legislatures, is, I am afraid, a bit going too far. Supposing you have scientists who tomorrow say, 'Yes, it is necessary that we should also manufacture atomic bombs,' are you going to permit them to influence your decisions? What I submit is that the scientists must be kept within their sphere of science only; and so far as formulation of policy is concerned, it must remain only the responsibility of Government.

We welcome this resolution, because it crystallises what Government have in mind with regard to the development of science. But, as I said, many good resolutions have remained unimplemented. I hope that this will not be one of those resolutions.

The Prime Minister and Minister of External Affairs (Shri Jawaharlal Nehru): Mr. Speaker, Sir, may I say that I am very glad that some hon. Members have given this House an opportunity of discussing this matter by moving this motion?

Much has been said with which, I take it, there can be no disagreement in this House. Much has been said not really in relation to this resolution but rather in regard to the scientific...

Some Hon. Members: The Prime Minister is not audible.

Shri Jawaharlal Nehru: Failure of science!

I shall now move near the other mike. Can you hear me now?

Hon. Members: Yes.

Shri Jawaharlal Nehru: I was expressing my pleasure and gratification at the fact that this resolution has been brought up in this House to enable not only the House but also the country to think about this matter.

Why was this resolution produced by the Government of India? Some hon. Members have said that it should have been brought out long ago, and

have asked 'Why so late?' Some hon. Members seem to doubt the utility of this resolution, because it might be just empty words not to be followed up.

Well, first of all, as a resolution of Government, it probably is, as Shri Humayun Kabir has said, the first time that a Government has in a formal resolution attempted to declare its scientific policy.

16 hrs.

So far as we are concerned, it is not only a declaration for the future, but some kind of an attempt to put in words what we have been attempting to do in the past. Shri Humayun Kabir mentioned that as long as 1948, one of the first things that was done by the then Government was the appointment of a Scientific Manpower Committee. It is immaterial whether that Committee's labours were great or little. The point is that thought is being continuously applied to the idea of developing science, scientific research and the applications of science, and even more so, the scientific approach to problems. Also in 1947 to 1948, the plan of a large number of scientific institutes and laboratories grew up which has ultimately led to the chain of National Laboratories, about 14 or 15 of them, in addition to a number of big Institutes. So that what I should like to submit to the House is that from the very beginning of, not this particular Government, but the Government after independence, attention has been given to science and to the advancement of science, both research and its applications.

Now, it is easy on the one hand, to say that yet the results have not been so great as we had hoped them to be. On the other, it is easier to say that the results have been rather remarkable. It just depends on how you look at it, what your measuring rod is, how you compare. I believe, and I do not think it is empty praise, but very eminent scientists from abroad who have come here, have been considerably astonished at the rapid strides in science that we have made in the last few years.

It is no good comparing what has been done in India with what has been done in the United States of America or in the Soviet Union or in the United Kingdom. They have a long background of scientific development. You must see where we started from; you must see, above all, that in India we have constantly to face in every problem, and perhaps more particularly in the development of science and technology, a kind of split personality, if you like, or a kind of a very mixed and contradictory approach to our problems, because, in fact, we live in conditions in this country which are terribly mixed. We live at one and the same time with the bullock-cart and with atomic energy; there is a gap of thousands of years between the two, and yet we have both; we live with every century surrounding us, not only in our external lives but in our minds. Professor Mukerjee might call it transcendentalism and some others might call it by some other word. Transcendentalism may be a very fine thing, and may be just superstition—it depends on how you look at it.

The point is that our living conditions, and even more so, our thinking conditions in India are a mixture, if I may say so, of the bullock-cart and atomic energy. We swing about from one to the other, and even those people who intellectually talk about science and about the modern developments of science etc., will, if I may say so, if you take them out of their research, their laboratories and their study, revert to the bullock-cart age! It is extraordinary, this double thinking, in all of us. I am not blaming anybody because our thinking is, after all, a product of the conditions in which we live; and the conditions are mixed.

It was in these conditions that we tried to push up science. Remember, science is not merely getting a machine and making it work. There are many of our industrialists—successful industrialists—who have got big factories.

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They buy a machine, they buy a man to run the machine and the factory functions successfully. That does not mean that the owner of the factory has arrived at the scientific age or the industrial age. He only has got the knack to use somebody else's brain product to make money. That is all very well. He can do it. I have no objection to that. But that is development of neither science nor industry in the real sense.

If I may say so with all respect, many of us here on every side of the House are experienced politicians, experienced public men, experienced in many things, but probably are not so experienced in science, except what we gather from newspaper reading. Naturally most of the people are not, because we have not got that background.

Now, to develop science in a country like this is not an easy thing. People think mostly of the application of science. True. But you cannot have applications of science without a foundation and theory and research. Therefore, it is necessary always to have research, to give freedom to the scientist to do his research work and then to apply it.

There is one thing more. Reference has been made to the great development of science in the Soviet Union. We admire the great advance of science in the Soviet Union, just as we admire the development of science in the United States or in the United Kingdom or other countries. I would submit, Sir, that there is no such thing—the word was used; therefore, I am using it—there is no such thing as 'Soviet' science or 'American' science or 'British' science or 'Indian' science. There is science which may develop more in a country because of greater facilities, if you like. I am prepared to agree with that. Similarly, I do not understand when sometimes in this House Members raise the question of 'Indian' systems of medicine and 'western' systems of medicine. I say there is no such thing. There is medicine, which is science, to which India has contributed, to which other countries have contributed. If you leave out the scientific part of it, then it is non-scientific, unscientific, bogus stuff, whatever it may be, whether it is Indian, Russian or American. We say that one country has developed one wing of it; that is a different matter. But either it is science or it is not. If it is not science, I have no use for it.

I say so rather emphatically, but I mean no disrespect to any person's ideas on the subject. But I do wish to point out how we are constantly confusing this subject, about a scientific approach which is neither western, nor eastern, nor northern nor southern. It is an approach. It is the approach to search out the truth by trial and error, by experiment, not to believe anything that you cannot prove to be true, not to disbelieve anything either, if you cannot prove it wrong, unless you can prove it wrong.

So that there is no such thing as Soviet science or American science. They profit by each other's discoveries. It may be that one day the Soviet comes out with some brilliant achievement in science. The next day there may be a British achievement, as there was recently—some months ago—a brilliant achievement of British science and American science. The real thing—and that is where, I believe, the Soviet Government has scored, if I may use that word—is the very great facilities they have given for the study of science; from the cradle upwards, you might say. The toys are scientific toys, technical toys. The boy or girl grows up playing with them, from the *creche* upwards, and develops something that we in India almost completely lack, which two countries in the wide world have to a tremendous extent, the two countries being the United States of America and the Soviet Union, that is, a technical view of life. They are technical-minded to an amazing degree. The machine is God to both these countries.

It is astounding how similar these two countries are even though politically they might be apart today. There facilities have been given and those facilities have naturally produced results. You cannot produce a genius by any manner or means. But what you can do it is to produce an environment in which a potential genius can develop, or also to give facilities so that there is a large reservoir of competent men doing science, a very large number doing it. Science advances really not so much because of genius but because of the work of a very large number of competent and talented men adding a step to other steps taken by somebody else.

Shri Bharucha made a suggestion which seemed to be rather remarkable. He said some kind of search team should be sent to find out talented people in science and he gave, I believe—if I am not wrong—as an example, the cinema owners going out to search for stars or starlets. I hope I am not wrong in that.

Shri Naushir Bharucha: In broadcasting also.

Shri Jawaharlal Nehru: I should imagine that the qualities necessary for a scientist are somewhat different from the potential star in the cinema world. (*Interruptions.*) The latter qualities are, if I may say so, external and can be judged more easily by the eye or by the ear, while the scientist's qualities are more internal.

But the real way to proceed is, first of all, for a widespread teaching of science; and, secondly, I entirely agree with Shri Bharucha, or scholarships and others to encourage every person who shows a particular aptitude.

May I say, apart from our starting the National laboratories, right from that time, this Five Year Plan business etc. is after all an attempt, maybe a meagre attempt, maybe not as good an attempt as we would like it to be, but an attempt of an approach on scientific lines to our problems.

Hon. Members today talk fluently about planning. But, I should like to remind them that planning 10 years ago was not an easy subject to talk about; or rather, not a subject which went down easily with people. If I may say so without disrespect to an old colleague of mine, a respected colleague—he left our Government because he did not approve of the Planning Commission being formed. Just that; not the individuals in the Planning Commission but just the idea of planning was not agreeable to him. There were difficulties in the way. However, this planning operation began and haltingly and stumblingly, if you like, with mistakes; anyhow, it went forward. There too you will find in the First Planning Commission Report and the Second this reference to science and the importance of science and technology. So, it is not merely a question of putting out a resolution suddenly but of building up an atmosphere for it, educating the outer public for it and gradually bringing it to such a pitch that the resolution represents a reality and not just some pious hope. When Shri Bharucha said that this may be a pious hope as resolutions are, I would respectfully remind him that this is the culmination of much work that we have done, not the beginning of it.

I should like just to refer to a number of matters that have been said. Many of the criticisms that have been made are, perhaps, justified. Many may or may not; it depends on what is your standard of measurement because you have to measure these things having regard to the background that we work with in India, not telling me that in Soviet this is done, in England this is done. Conditions are different there; there is a tremendous deal of work behind, a period of time and all that.

Again, some criticisms have been made which, I must say, appear to me to be rather uncharitable to our institutes and others. I think our National Laboratories have made mistakes naturally, but, by and large, they have done very good work. And, I was

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surprised to learn from some of the hon. Members who spoke that these laboratories would not, it was said, do a particular type of work. Some laboratory, it was said, would not do State work—I just do not understand that—and that they wanted only work sent by the Central Government. This was news to me because most of these laboratories undertake any problem that is sent to them by any individual, private, public, government, State or Central. Most of the problems that come to them are not from government at all. They are either from some institution or private firm or from some government agency. Some problems are purely governmental problems; and there are other problems they are dealing with all the time. I do not know where any difficulty arose about it.

Talking about education, much was said about education. Here again, it is not an easy matter. I am not at all happy about the state of our education, though I will say this that we have made very considerable progress. It is not enough for us; we want more progress—that is a different matter—both in quality and quantity. But, we have made very considerable progress in these last few years. Anyhow I am not happy at the state of science in our education; that is perfectly true. There is a lack of competent instructors; there is a lack of equipment; and, it is now, I believe, changing and I hope will change rapidly. I am not happy at the state of science even in our Universities, also, again, for lack of equipment often, because science will ultimately be taught really in our Universities, not so much in our big institutions and National Laboratories. These institutions are there to take the products of the Universities and not to deprive the Universities of their best men and undertake teaching. I do wish that in our Universities much more effort is given to the teaching of basic science.

Unfortunately, the Universities sometimes want to show off, show off in the sense they will have it said, "Oh, we teach atomic energy," when atomic energy requires vast equipment and apparatus and all that. I am not referring to normal nuclear physics. That, of course, every University should teach. But I am talking about higher work. It cannot be done unless we have all that. It is much as we can do to keep our heads above water in fact—our atomic teaching in Bombay and elsewhere wherever it is, the higher course I mean. Because of the reactors and all that, we cannot do it in every University. In the United States of America they may do because they have got vast resources. We have not got the men and if we spread out our men here and there we never get that teamwork which is required for higher power work. But, what the Universities have got to do today is to teach basic science and basic science includes basic nuclear science in a competent way so as to give a very thorough grounding to our students; and then they can go on to our specialised institutes etc., where they can continue their studies.

Another thing: it was often said about scientists becoming administrators. Shri Bharucha said something which sent a shiver down my spine. He said that the scientists must be kept well within their spheres and not allowed to interfere with policy. This is just the reverse of what most of the other Members have been saying previous to him. I can understand that; and it is perfectly right to say that the scientist should not waste his special knowledge and experience over some relatively secondary matter, like administration. I agree; I say it deliberately. Administration is a relatively secondary matter to high-class science work and I fail to see why the scientist in our country takes to administration. Of course, administration is considered to be the topmost thing; and everything else is secondary. That really represents the state of backwardness of our country. It is a relic of the British times. In

any advanced country, the administrator is always respected but he finds his proper place; he is not on the shoulders or head of everybody as he was in India. Scientists, engineers, educationists, authors—all these people find their place in an advanced country. I do not want an able scientist to lose his time in administration as such. I have been worried that a man like Dr. Bhabha should have to spend so much time over just administration and we are trying to find a way out, giving him a very competent man to take away the administration part of his work, though he will be there in supervisory charge. These problems have to be dealt with as they come. On the other hand, if Dr. Bhabha had not been there in charge, to some extent, of administration also, the Atomic Energy Commission would never have gone up the way it has gone up already. Again today scientists spend quite a lot of time in attending conferences, wandering about all over the world. I do not know what to do about it. I suppose it is necessary. This applies to scientists all over the world.

I may say that our Defence Science Organisation has made very considerable progress under its very able head, Dr. Kothari. In fact I hope—I am not thinking in terms of any tremendous weapons and all that; we are not competing with Russia or America—that in many ways it is going to show adequate results.

There is again one thing which the hon. Members may or may not know. One of the divisions of our Planning Commission—I forget what it is; it is perhaps the Manpower Division—has produced a remarkable series of studies on manpower—remarkable not only in the efficiency and the speed with which it has been working but the remarkable work that has been done. I should like to give due credit to that particular division. It is a small division under a very competent head. I am sorry I cannot distribute copies of them but they have been placed in the library here. There are nine or ten separate studies which will give you complete facts about engineers, technicians of all types in India and Indians abroad. All that is necessary before we can plan. I hope to get these things printed and then the hon. Members can see but even now they are available in the library.

There are so many other things that I should like to refer to. I was surprised to hear Shri Mukerjee saying that the Indian Statistical Institute near Calcutta had not produced a single machine. As a matter of fact, they have produced a rather remarkable accounting machine which is in demand all over the world and it is considered to be a big feather in their cap. It is the first time that I have heard that they pay Rs. 10 lakhs as rent. I did not know whom they pay to and how and where they get the machine from. I would really like to find out. I am interested in this matter. I have been there and I have seen even their budgets but this particular fact never came before me.

Shri Mukerjee has suggested that a committee should be appointed to look into our national laboratories. In the rules, I believe it is stated that every five years a high-power committee should go round and examine our national laboratories and institutions of importance. We have had two such committees. The last one, I think, met two years ago and it consisted of mostly Indian scientists but one very eminent British scientist was also on it. He was the Chairman or a member—I forget. That committee produced a big and interesting report. This fact is constantly before our mind—about this kind of reappraisal of the actual work done. Now we are trying to do this smaller reappraisal frequently and in fact we are appointing special scientists for that.

Again an impression was created by speeches that our laboratories are not doing any research, especially in regard to food. Only three days ago, I visited the Pasteur Institute and the

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Nutritional Research Institute at Coonoor. I was much struck by the very fine work done there. The Pasteur Institute I refer to not so much because of rabies and dog-bites but because they are doing extra-ordinarily good work in regard to influenza and the new influenza epidemic which spread—the new influenza....

Shri C. D. Pande:.....Bacillus.

Shri Jawaharlal Nehru:.....not bacillus but virus. Very soon after the thing arrived they produced enormous quantities of vaccine and checked this disease in India. The Nutritional Research Institute there is also doing remarkably good work in that field. I do not say that other institutions could not do better work.

I would just refer to one thing. An eminent scientist who works in Almora—Dr. Boshi Sen—showed me the other day a very fine variety of irradiated wheat which really is something surprising: how the use of little isotopes had improved that wheat and how that would increase wheat production tremendously.

There are many things, Sir. The subject interests me. I am glad that it interests the House. I could speak about the other aspects but I do not wish to take up the time of the House any further except to say that I appreciate all that has been said in praise or appreciation of this Resolution and I earnestly hope that the Government will be able to live up to this Resolution and will have the support of the House.

*SURATGARH MECHANISED FARM

Mr. Speaker: Now, we will take up half-an-hour discussion. Shri Yajnik will have ten minutes and the hon. Minister will have ten minutes and any other hon. Member may put a question.

Shri Yajnik (Ahmedabad): Sir, I am happy to get this opportunity of opening a discussion on the progress of the Suratgarh Mechanised Farm which began its operations in August, 1956. It all began with the visit of the Russian leaders, Khrushchev and Bulganin. Going round the country, they felt like giving a gift of some Russian agricultural machinery. When the matter was brought to the notice of the Central Government, they appointed a committee to look for a suitable site where an ideal agricultural mechanised farm might be opened. Now, during these two years that have elapsed 30,000 acres or about that area has been acquired by the Government. All the Soviet machinery that was promised is already on the site. The unfortunate part of it is that only 3,000 acres or about that area had been sown and used. A good bit of the Soviet machinery is still lying in crates, almost exposed to the weather, without any shed. And when I saw photographs of this machinery I felt profoundly concerned.

According to the information available to us—it is a very good thing—in the very first year, 1956 *rabi*, Government was able to sow 2991 acres. The *kharif* crop, of course, was much lower—1865 acres. But what is more surprising is that the 1957 *rabi* crop or *rabi* sowing instead of increasing decreased to 2,484 acres—that is, 500 acres less. So far as the expenses are concerned, we find that while Rs. 9·11 lakhs were spent in 1956-57, Rs. 11·73 lakhs were spent in 1957-58 and Rs. 14·31 lakhs are to be spent in 1958-59. That is revenue expenditure. What is all the more surprising is that under the head of capital expenditure nothing was spent in the year 1956-57, only a small sum of Rs. 7 lakhs was spent in 1957-58 and Rs. 13 lakhs are to be spent in the year 1958-59.

Why are we not making any progress that we should have made with all the machinery available, with all

*Half-An-Hour Discussion.