भी बड़ी बड़ी सुर्ख़ियों के साथ शाया होते हैं, नामर्द को मर्द बनाया जा सकता है, जवानों को नौजवान बनाया जा सकता है । इस तरह की बात इश्तेहारात में अख़बारों के ज़रिये छपती है ।

मेरे पास इस वक्त दो-तीन इश्तेहारात के नमूने मौजूद हैं । मैं आपका ज्यादा वक्त नहीं लूंगा । सिर्फ दो-तीन मैं आपके सामने जरूर रखना चाहता हूं और उनके मुतल्लिक सभी आदमी अच्छी तरह जानते हैं । कहते हैं "बेरूनी मालिश से दिमागी कमज़ोरी . . . सर का दर्द, मेदे और जिगर का दर्द, जोड़ों और हाथ-पैरों का दर्द . . . " इसी तरह की तमाम और बातें हैं, जो इश्तेहार में दी हुई हैं दूसरी जगह कहा गया है "चेहरे की स्याही सफेदी में तब्दील हो गई । हुस्न जादू है, हसीन वा खूबसूरत बीवी के रुख़सार गुलाब की पंखुड़ियों को शर्माते हैं" और तीसरी जगह कहा गया है—"फ़सादे ख़ून की तमाम बीमारियों के लिये मुसल्लमा सरताज ईजाद, तंदुरुस्ती का ज़ामन, जड़ी-बूटियों से तैयार किया हुआ । फ़सादे ख़ून और उससे पैदाशुदा अमराज़ की सौ फ़ी सदी कामयाब और हैरतअंगेज़ दवा है ।" इसी तरह से बहुत से और मर्ज़ हैं और एक इश्तेहार नामर्दी के मुतल्लिक है—"आबाये रईसा और जिस्म को तंदुरुस्त और तवाना बनाने के लिये बेनज़ीर तोहफ़ा—अक्सीर मकव्वी—जिस्म में नई ज़िन्दगी पैदा करके तमाम अज़ा में ताकत की बर्क़ी रौ दौड़ा देती है और बदन को तंदुरुस्त और ताकतवर बना कर तमाम अज़ा में काम करने की सलाहियत और काबलियत पैदा करती है—हलक़ से उतरते ही आसाब और दिमाग पर फौरन असर करती है ।"

THE VICE-CHAIRMAN (SHRI AKBAR ALI KHAN) : I think that is not right. You should keep the dignity of the House. It is not right to read such advertisements.

श्री प्यारेलाल कुरील "तालिब" : ये इश्तेहार आम हैं और कानून बनने के बाद भी ये छपते हैं । कानून बनाना आसान है मगर कानून को लागू करना मुश्किल है । अगर आप कानून बनायें तो इसको देखें कि इसका अमल-दरामद ठीक से होता है कि नहीं आप जितने भी ऐसे अखबार उठा लें, तो देखेंगे कि इसी तरह की और पीर, फकीर, जादू की बातें दर्ज होती हैं । उनको रोका जाना चाहिये । इस पर ज्यादा न कहते हुए मैं असली मकसद की तरफ आता हूं । तीन-चार बातें मुझे कहनी हैं । जो आयुर्वेदिक तरीके से इलाज करने वाले हैं, यूनानी तरीके से इलाज करने वाले हैं, मैंने अक्सर देखा है कि ये लोग बड़ी आसानी से अपने को रजिस्टर करा लेते हैं ।

उपसभाध्यक्ष (श्री अकबर अली खान): अगर आपको कुछ और कहना हो, तो दूसरे रोज कह सकते हैं । लेकिन मैं यह समझता हूं कि आप काम की बातें तो कह चुके हैं । तीन बजे से हमें दूसरी कायवाही करनी है ।

श्री प्यारेलाल कुरील "तालिब" : अभी तो शुरू किया है, अभी बहुत कुछ कहना बाकी है ।]

3 P.M.

THE VICE-CHAIRMAN (SHRI AKBAR ALI KHAN) : Then you will speak on the next working day when we will take up this Bill. According to the programme, we have to take up the motion of Shri Mani and Shri Arora. So, I would call upon Shri Mani to open the debate.

MOTION RE. ANNUAL REPORT OF THE COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH

SHRI A. D. MANI (Madhya Pradesh) : Mr. Vice-Chairman, I have pleasure to move;

"That the Annual Report of theCouncil of Scientific and IndustrialResearch for the year 1962-63, laidResearch fo$_r$ the year 1962-63, laid

[Shri A. D. Mani.j

on the Table of the Rajya Sabha on the 2nd May, 1963, be taken into consideration."

Sir, I am much obliged to those concerned for alloting time for the discussion of this Report. One of the reasons why I gave notice of this motion is that this House, so far, for many years, has not had the opportunity of discussing the Reports of this Council. I must confess that I am not a scientist and much of the research material which is contained in this volume was not intelligible to me and I could not absorb the value of the research work that has been done by the Council.

Sir, I wanted to raise certain broad issues regarding scientific education in this country and the facilities that are available to research scholars in science. It has been stated that India spends one rupee per head per year on scientific research; China spends Rs. 6 to 7 per year on scientific research; seventy dollars are spent by the United States and 36 dollars by th$_e$ Soviet-Union. In spite of the fact union that our Prime Minister and the Planning Commission have repeatedly laid stress on the value of scientific re-seach, we have not been able to increase the allocation of the grant to the Ministry to Rs. 5 crores.

SHRI M. P. BHARGAVA (Uttar Pradesh): But how do they compare with the national income?

SHRI A. D. MANI: Whatever the national income might be. The national income was just what it was in the Soviet Union some years ago. In 1929-30 the Soviet Union was in no way different from India in respect of national income, but it has been increasingly spending more money on scientific education.

During the Third Plan we have estimated to spend about Rs. 200 crores on scientific research which works out at Rs. 40 crores a year. Taking the population at forty crores, the country spends one rupee per head per year. I thought that I should draw attention to the unsatisfactory allocation cf funds for scientific research in the country.

I admit that the Council of Scientific and Industrial Research has rendered valuable contributions towards scientific education in this country and has stimulated interest in research. I do not detract from the value of the work done by the Council. But in this connection, I must draw the attention of the House to the views expressed by Prof. Blackett at the Geneva Conference of Scientists held some time ago. He said that the under, developed countries' need was not fundamental research but research which was related to the development of the economy of the underdeveloped countries. Dr. Chandrasekhar who is one of the world's well-known astrophysicists—I have the honour and reflected glory of being a class-mate of his in the Presidency College—said the other day that the kind of research that was done in India was not adequate to sustain continuous interest in scientific talent. I know that the Minister might say that these are the views of visiting scientists to this country and do not bear relation to the value of the work done by this Council.

[THE DEPUTY CHAIRMAN in the Chair.]

Madam, my submission to the House is that in regard to the research done by the Council of Scientific and Industrial Research the research must be related to the urgent needs of the industry. I would like to refer to page 15 of the Report wherein you will find that the Central Public Health Engineering Research Institute, Nagpur, has been trying to do research into the invention of an economical cow-dung gas plant for operation. We have told on the one hand that cow-dung is being wasted in this country, that we should have ploughed in into the fields and increased the fertility content of the fields. But on the other hand, we find that one of the Institutes run by this Council is experimen-

ting with a cow-dung gas plant. Some time ago, we also heard about our solar cooker which was put on display and hastily withdrawn. I do not know what has happened to the solar coo[1] which had been invented by the National Physical Laboratory.

DR. M. M. S. SIDDHU (Uttar Pradesh) : Cow-dung gas plant gives better manure.

SHRI A. D. MANI: But I would like to know whether the views of the Food and Agriculture Ministry have been sought on this. I mean, after all the research must be related, to what is going on in the country. In various Ministries . . .

SHRI M. SATYANARAYANA (Nominated): This fact has been repeatedly stated but it has not been contradicted so far.

SHRI A. D. MANI: The solar cookar has been withdrawn. We do not Hear anything more about it.

I may just mention another aspect. It may be a matter of opinion. The Indian Institute of Petroleum. New Delhi, is interested in distillation, fractionation and evaluation of crude oils from the Ankaleshwar, Kalol and Rudrasagar wells. The same work is being duplicated by the Oil and Natural Gas Commission at Dehra Dun. What I would like to suggest is that the research work that is being done in these institutes and laboratories must have a practical bearing. And I recall in this connection what Prof. Blackett said—the need for research in this country should be to lay emphasis more on the practical needs of industry than on fundamental research. I would like to mention here that the Estimates Committee which went into the research programme of the Minisry reported—

> "The Committee consider it rather unfortunate that in some cases the results of research should have been hurriedly released to industry for exploitation, for such practice would make enterpreneurs hesitant in taking up researcn results for commercial application. The Committee hope that the practice of testing processes on pilot plants before their release and making sure that they were acceptable and economical, which had since been adopted, will be strictly adhered to."

This is the comment of the Estimates Committee on the research work that has been done by the Ministry.

Madam, I would like to suggest that if the research of this Council is to have any practical value, there should bo a coordinating apparatus between tiie Council and the industry in our country. I believe that the Government is going to set up a joint Committee to consider this matter but what I would propose is that there shouia be a joint Committee of well-known organisations like the Federation of Chambers of Commerce and Industry and the Council to go into the research programme of the Institute from time to time and see to it that the work of this Institute has some effect on the industrial development of this country. Madam, the Estimates Committee has also mentioned that there has been no adequate contact with the industry in regard to research and I do hope that Government would not consider the setting up of a joint committee as unreasonable. It should not be confined only to the persons who are connected with the Council.

I would also like to suggest that the Small Inventions Development Board which functions under the aegis of this Council should keep in touch with tne inventions in the various States. For example, in the City of Nagpur, the other day somebody invented a new voting machine for use by the Election Commission. I had to give him a number of letters to get the machine demonstrated in Delhi. There i$_s$ some

[Shri A. D. Mani.] scientific talent in the various States and they do not get opportunities for adequate seli-expression and the Council or the Small Inventions Development Board should go to the States from time to time and find out the scientific talent and the inventions that are developed in those areas. It might be of help to a large number of people who are scientifically minded to put forward their talent in the interests of development of science.

Madam, I would like to suggest also—and this is a matter which has been engaging the attention of the country—that the time has come tor us to create an all-India Scientific Service. What is the nature of this Service people would naturally! ask me to explain. What I have in mind is that we must have an all-India Scientific Service which will consist of persons whose contributions to science have been indeed recognised not only in India but abroad and who may b» available for visiting Universities as Visiting Professors for a period of time. At present we do not have such a Service. Every University is zealous about its autonomy and wants its own Professors to teach the students within that campus. If there is an all-India Scientific Service, we will be able to absorb a good deal of available scientific talent which is not finding adequate opportunities for employment and expression in the country.

Sir, in this connection I might mention that these scientists who go abroad find that the conditions abroad are far more conducive to research than in our country. And this explains why a number of men who have trained themselves in science abroad and who have made contributions to science abroad have chosen to stay abroad and accept foreign nationality in the interest of science.

SHRI AKBAR ALI KHAN (Andhra Pradesh): Very few of them.

SHRI A. D. MANI: But we have lost. And the biggest of them Dr. Chandrasekhar, is an American citizen at present. Now, the Government should really find out—and the Prime Minister has been seriously concerned about this matter, he has talked to some of the scientists himself—from these scientist themselves in the form of an enquiry as to why they find staying abroad far more conducive than staying in the country. Has any such systematic survey in this matter been done? There is no point in talking to a scientist who stays abroad to ask him why he is staying abroad, because he would say the atmosphere in the country is not sufficiently conducive. We should like to have a survey made on a systematic basis to find out what inducements are available to scientific talent outside this country and what are not available in our country. And this is correlated to my proposal for the creation of an all-India Scientific Service.

Madam, it is a matter of regret that in our country in spite of our homage to science and our recognition of the work of scientists in the various fields, we have not given scientists the respect that the Soviet Union has given. I wou'd like the Minister to go through the warrant of precedence. There is one Nobel Prize Winner amongst us for whom there is no place in the warrant of precedence. I would like to ask him what is the position given to National Professors? Probably below that of a Parliamentary Secretary, I do not know.

SHRI ARJUN ARORA (Uttar Pradesh): Below a Deputy Secretary.

SHRI A. D. MANI: Those persons are not given that recognition which the Soviet Union gives to its scientists. The hon. Minister knows that in the Soviet Union a Member of the Academy of Sciences is ranked higher than a Minister. Unless we create a scientific atmosphere in this country

and respect for science, scientific research wili not develop on the lines desired.

Madam, I would like also to point out here that in regard to the research work done by the Institute, some of the work has been of a spasmodic character. The Council did experiments on the production of vitamin 'C in the country. But before the processes could be developed, this was taken up by the private sector. The Glaxo Laboratories are now going to produce vitamin 'C in large quantities for the country. If this Government is to justify its existence the follow up procedure must be taken up. There must be systematic attention given to the follow up procedure to see that the results of the work of the Council are fully exploited for the development of industry.

Madam, I would like to mention here also that this Council may do very valuable work in regard to the supervision of scientific education in the various States. At present the Universities are autonomous in regard to the educational syllabus which the}r prescribe for the students. We are thinking in terms of an India which will emerge as one of the countries which has given its most earnest attention to science. If our scientific work is to be co-ordinated, there may have to be amendment of the necessary legislation concerning the Universities to permit this Council to exercise some kind of supervision over the scientific education imparted in the Universities. Quite a number of University Professors have told me that the standards of scientific education in some of the Universities are falling and they do not know how far that fall is related to the experiments conducted in the regional languages in some Universities. Now, if we have to develop science as an all-India subject, and if we are to give continuous attention to the growth of science in the States, it is necessary that the Council of Scientific and Industrial Research should have some method of supervision of scientific education in the Universities-Madam, in regard to the publication of journals of this Institute, I believe more than 500 papers have been published. I understand that the Ministry is now going to bring out publications in the regional languages. I believe already in Canarese some publications are coming out. Madam, first of all before we undertake a translation of scientific work in Indian languages we must have a commonly accepted scientific terminology. Is there a commonly-accepted scientific terminology at present? Does the Council recognise the use of well-known international terms like 'radio isotopes' or have they translated these terms in Hindi? This is a question I would like the Minister to answer when he replies to the debate. In any case unless there is not going to be a switch-over to Hindi in 1965, the need appears to me to be to prepare an adequate scientific lexicon *fn* the Hindi language. But let this not be hurried and let there be no puritanical approach to the evolution of scientific terminology. It need not necessarily be based on Sanskrit. It should be based on science and that should be the primary criterion for the evolution of experiments.

Madam, I would like also to suggest that in regard to the tours undertaken by the various professors to the States, they should try to see that necessary encouragement is given in the various States to scientific talent by prodding at the Ministerial level.

One final suggestion I would like to make before concluding and that is in regard to the allocation of a certain percentage of our national revenues for scientific research. The recent conference of scientists held in Delhi, which the hon. Minister attended, recommended that a certain percentage of national income should be earmarked for scientific research. There might be a good deal of opposition to this on the part of the Fi-

[Shri A. D. Mani.] nance Ministry because earmarking the national revenue for scientific research would be very difficult. The recent conference of scientists wanted that the number of scientists should be increased from 15,000 to 25,000. We would like the number to be increased. What I would like to suggest is that this is not within the purview of the Ministry, which the hon. Minister heads, but the Government as a whole. What I would like to suggest is that in regard to income-tax, since you are levying surcharges, a certain portion of the income-tax should be earmarked for science because the income-tax is largely derived from companies and the companies benefit by scientific research; and it is very necessary, naturally, for us to expect that the Government would set apart a certain portion of its revenues at least from companies for the purpose of scientific education and research in this country. I do not know whether this suggestion would be accepted by the Government. I know that the Minister himself would like more funds to be placed at his disposal. We are serious about the growth of scientific education and research in this country and we should try to see that funds are available to the Institute. The only thing is that I would like research to be a little more practical, a little more related to the needs of industry.

One final suggestion before concluding, and that is in regard to the papers published by this Institute. We have no means—I mean a layman has no means—of knowing of what value they are from the point of view of applied research. I do not believe in foreign appraisal of our work as necessarily being superior to national appraisal but science being international, it is possible for the Government to invite foreign experts in the various fields once in two years or once a year, to go through the papers published by this Institute and inform the Government in a report whether the work undertaken by this Institute is of a valuable character. It may be a sort of check aiso on this Council. It will also be an inducement to the Council because they would be undertaking the work under international supervision. I do hope aiat as a result of this debate and as a result of the pressure, which the recent conference of scientists held in Delhi will exercise on Government, the Government would be enabled to have more funds at its disposal for this Council and try to help the growth of scientific education which will enable India to emerge as a nation very strong in scientific research like the Soviet Union and China.

The question was proposed.

THE DEPUTY CHAIRMAN: There are 8 speakers. Therefore, ten minutes time-limit should be maintained.

SHRI BHUPESH GUPTA (West Bengal): Madam, I would only like to make some observations on the Report or rather in relation to the problem facing us in the field of scientific research and industrial research in particular. The first point that I would mention is about th^ allocation of funds. I am in entire agreement with the Ministry and others concerned of the Department that the allocation given by the Planning Commission is far too indaequate io meet the minimum needs of the country's scientific research. I think they made a demand for Rs. 58 crores under the Third Plan but sanction was made for Rs. 35 crores. Actual allocation was made, *i.e.,* money made available was Rs. 28 crores. Now, that is regarded as a very very inadequate sum by all the scientific experts including—he is not a scientific expert but the custodian of this Department—Prof. Kabir. He himself had to complain against the paucity of fund that was placed at the disposal of the various institutions concerned. Another person who strongly objected or rather complained in regard to the allocation was Prof. Mahalanobis who deals with many scientific institutions and has

had considerable experience in the matter. It appears that Prof. Kabir suggested that at least one per cent, of the national income should be allocated for the scientific research and the amount given is much below one-third of one per cent, of the national income according to his computation. Therefore, I think it is possible to find money provided there is a will to do. I think we spend a lot of money on various things. Instead of that, we should better divert our funds for scientific research, for industrial research. For a developing modern economy it is absolutely important that we train up our technicians— scientists and technologists—in the different branches of industry and technology. That is not being done.

Some observations have been made about the work of the Department and it has been said by many, especially an Indian who is now settled in the U.S.A.—he came to this country and he said—that the work was unsatisfactory and was even discouraging and disappointing. I am not saying that no progress has been made. Obviously, nobody can say that. We have about 28 National Laboratories and 40 Universities. The number is there, maybe a few more have been added as National Laboratories but these are not adequate. The point to consider by this House is whether the progress is satisfactory, is at least as rapid as it should be under the existing conditions. I know our limitations. Nobody says that we should draw up a blue-print of progress which has no basis in reality or not related to our possibilities in matters of resources or otherwise but it has been contended by many experts in the field that it is possible to step up the scientific research in the country and for this what we need immediately is a greater allocation. It is a costly affair no doubt. You cannot promote scientific research or technological research without putting in the requisite funds and here again as far as the foreign exchange component of the expenditure is concerned, we do not get enough foreign exchange resources allocated for bringing in the machinery and other things, the instruments and implements, for the promotion of scientific research. Here again I would support the Minister when he raised his voice and said that a greater sum should be allocated, that the foreign exchange should be increased so that the Department concerned or the institution concerned, the laboratories, etc. could meet their requirements.

I do not see why the Planning Commission or the Ministry of Finance should be tardy in this matter. We are not turning out any additional number of engineers and technicians in the country. There is lack of these already in the field and I think if it goes on in this manner, then we shall be soon faced with the problem of a kind of deadlock, that is, we will not expand very much. I think we should produce or make arrangements for turning out from our Universities and institutions a larger number of graduates, diploma-holders, etc. so that we can put a much larger number of people in the field.

Here again 1 find, as far as registration is concerned, all are not registered. According to the estimates of the Ministry there are about 450,000 scientists and technologists in the country out of whom it seems only 2,50,000 are actually registered. Therefore, nearly two lakhs of people, scientists and technologists, are not even registered. Why should it be so? We should be given a satisfactory explanation as to why it should not be possible for the Government to see that every scientist and technologist in the country gets registered at least so that we know our resources actually and we know how much we can mobilise at a given point and then we can choose from a pool or otherwise or see how best we can utilise their talent. If two lakhs of scientists and technologists go on unaccounted for by the Government, it is not a good thing. Certainly, it does not speak well of the Ministry in charge of

[Shri Bhupesh Gupta.] conducting the affairs of our scientific and technological research.

Then we have the problem of our people trained abroad. A register is prepared but it seems that still a large number remain abroad. We have not been able to attract them and here patriotism is not enough. We must give moral inspiration undoubtedly and there comes in patriotism. Appeal in the name of patriotism but there should be material stimuli also, that is to say, material incentive. It is a wrong thing to build up the scientific cadre or such institutions only on the basis of appeals to patriotism and so on. I am not saying that we are not giving remuneration and so on but this problem should also be gone into. I think we should do everything possible to get them back to the country. At one time it was thought that 8,000 such Indians trained abroad remained abroad. It seems many came and some have gone back too. Here again a report appeared in the "The Hindustan Times" some time back where it was said that out of every four scientists and technicians educated abroad who came back to this country after higher education, three went back. This is the position. I do not know whether it is two or four but this is the report that appeared in the newspaper, Now, I would mention that we have come across persons who came with great hopes or expectations after foreign education but they did not get any proper facility or proper employment and all kinds of odd jobs were given to them. It seems in one case some of the scientists and technicians are made just to write files, to deal with files, from morning ten to evening five. Their talent is not properly used. Many articles have appeared in the newspapers. I should like to know how such criticisms in the Press are dealt with by the Government and what steps are being taken to [5]m-prove the situation. Otherwise, if we are not in a position to utilise the existing talent, how can we inspire others to come into the field? Here is one such, I will just read it. It has appeared in the "Hindustan Times" of 1st June, 1963:

> "Well-qualified engineer coming from a responsible practical job in a foreign country finds himself signing official files from 10 A.M. to 5 P.M. every day."

Well, official files can be signed by anybody. I don't know what those files are. Normally, these files can be signed by anybody almost blindfold. Deputy Ministers or Members of Parliament can, given the files, easily sign them. The question is whether engineers are being given prosper jobs. That is the point. We cannot allow our talent to be wasted. It is not merely a question of giving the man employment. The question is one of putting him on a suitable and most profitable job, from the point of view of the larger national interest. The number of people engaged in scientific research in our country is only 15,000. It is far too inadequate for our Third Plan. This is the position. It should be much higher. And this cadre cannot be trained overninght. There should be a proper scheme and a right perspective and incentive and so on.

Then there is another point. People who are in the senior field do not make room for the junior and younger people. I am not saying that seniority should be given the go-by. But there is substance in the criticisms in the newspapers when they say that some of the seniors in the scientific field in-du'ge in boss:sm rather than try to inspire people. In fact, Prof. Prasanta Chandra Mahalanobis himself has stated that they indulge in bossism rather than become fountains of inspiration. I am using, more or less, his own words. I would like to know how these things are being handled, because it is the younger and junior people who are to be inspired and educated. Normally, if you go to the

Soviet Union, in their scientific insti- i tutions you will find that it is the younger people who are in the picture more than others. The point is not so much to show your talent. The point is not so much of giving a good account of your own merit only as an individual. You must import it to others and train up younger people so that they may suitably multiply and take positions in our industry as scientists and technologists and so on. This is a matter for the Minister to consider. We can only make suggestions about it and say that the total number is very small.

Then again, these academic qualifications should not be always the criterion. They are undoubtedly important. But experience and other things should also count in this matter. It is quite possible that an engineer might prove himself a very good research worker although his educational qualification as such, this dip'oma or degree, may not show him to be very high up. Well, the other day I was talking to a scientist in the Soviet Union—I think I may mention it here —wen I visited a University there, and he mentioned an under-developed country. I would not name the country either. He said: "Good academic degrees are there, but they have not seen even a single machine". And one student with very high qualifications who had gone there for admission into some engineering institution was asked, "Suppose the electricity fails in your room and suddenly the lights fail, what will you do?" The answer given by the student was, "1 will call for the electrician". You see, h_e has not the slightest idea of what it means although he has qualified himself in that particular line in a University. Therefore practical training and knowledge is very important.

SHRI AKBAR ALl KHAN: We are glad you spent some time with the scientists also there.

SHRI BHUPESH GUPTA: The emphasis should be on the practical aspect also. I think here we should draw from among the skilled workers and technicians and foremen who may not be so qualified from the point of view of University education. We would like to draw upon that untapped talent for training our scientists and technologists. One of the experiences of the Soviet Union in this respect is that they themselves got this talent from the workers who were working, not so much from the Universities. Having got them they sometimes sent them to higher institutions and academies for higher learning and education. But in our country there seems to be over-emphasis on educational degrees and Prof. Kabir also has very high educational degrees, having been a lecturer in a University and so on. But I think it does not necessarily mean that any similar degree-holder will be good in practical jobs.

Proper utilisation is important. According to the estimate of the Government—I think it was the Estimates Committee's Report, or some other report—it is stated that 10 per cent, of our scientists were unutilised. They are either unemployed, or are employ, ed in some non-scientific job. Such is the position. I could give many more instances of that nature. The point is we are not utilising the existing talent. That is my point and Government should do everything possible in order to utilise them. The Indians abroad should be attracted towards our country and we should look after them so that they remain here. It is not easy to train up scientific cadres.

As far as other things are concerned, I do not wish to say very much because much depends on how we conduct the affairs of our scientific research. Our industrial development, scientific development, the general progress of the country and the building up of a modern economy, they are all interwoven with how we manage the affairs of scientific research and so on.

[Shri Bhupesh Gupta.]

Madam Deputy Chairman, I would repeat again in this connection that demand for allocation of higher funds is absolutely justified. If necessary, we should think of other measures of nomy in other fields; but if at all we are pledged seriously to rapid industrial and scientific progress in the country, it is not enough only to have some show pieces and so on, and show certain things that have already been done. What is important is to have a dynamic and vigorous approach and this should be backed by all sections in the countsy, especially by those who control our finances. This is what I have to say, and I hope that the Government will take every step in this matter. They should draw on the working classes for training young men into able technicians and engineers and in this matter there should be consultations in the private sector as well as in the public sector with a view to seeing that talented and promising workers coming from among the working classes, are given higher education and fitted to hold higher places. Then the picture will itself change and incentive will grow and we will be drawing up and getting into the services a much larger number of people in a short time.

SHRI ARJUN ARORA: Madam Deputy Chairman, scientific research in this country suffers from many handicaps, the biggest of them being that industry in this country does not take any interest at all in any research whatsoever and the whole burden of financing and establishing scientific research institutes falls on the Government. Government has limited mean$_3$ and the C.S.I.R. $_a$nd the Ministry deserve our congratulations for what has been achieved with so little resources within such a short time.

SHRI M. SATYANARAYANA: What about Tatas?

SHRI ARJUN ARORA: Tatas are perhaps one exception among the industrialists. I challenge all the industrialists and all the pro-capitalist elements in this country and elsewhere to mention any other name. The industry in this country is really callous and the fact that only the name of Tatas can be mentioned lends support to my statement rather than contradicting it. In other countries, particularly in capitalist countries, it is the privately-owned industry which engages scientists and promotes research. Industry in this country has singularly failed to do so. There is a case in point. Take, for example, the cotton textile industry which today still follows the age-old technique and though during the War the industry was given taxation relief to set apart money for establishing textile research institutes only the Ahmedabad units set up an institute of textile research. In U.P., for example, the UP. Government and the Government of India have been urging upon the textile industry of Kanpur to set up a textile research institute and they have not only been urging upon them to do so but~the Government of India and the UP. Government have offered monetary assistance for that purpose and that assistance is not being utilised by the industry because 25 per cent of the cost will have to be met by the industry itself.

With such unenlightened industry in the country, it is not surprising that our young men who go abroad and acquire higher education feel frustrated and disillusioned when they come here. It is not only Government whose job it is to give employment to scientists; it is also the duty of industry to give them employment. It is correct that in certain cases Government has failed to make proper utilisation of scientific talent and the hon. Shri Bhupesh Gupta is right in saying that scientists feel frustrated when they are asked to deal with cold files from 10 A.M. to 5 P.M., but what is the record of industry? Industry in this country does not employ scientists. Far from encouraging research, far from sending people for training, it does not even give employment to Indian scientists who come back after training.

Then, Madam, only industry is not t) be blamed in the matter of scientists who yearn for stay abroad and accept jobs elsewhere. Government does not look into the mental attitudes of the students whom it allows to go abroad. Why is it that some sort of patriotism does not compel the Indian student trained abroad to come back and suffer hardships here rather than accept higher paid jobs in America and Great Britain? The choice of students for training abroad, I must say, is highly defective because only their academic qualifications are looked into. I had the misfortune to have as my guest for a week last year an Indian mining engineering student going to America. It was a sickening experience, Madam. He was all the time talking of America and though h_8 had never been there, he was talking of a wonderland; and though he was going at the cost of the Government of India, every action of his made me feel that he would never come back; and I felt so annoyed at his attitude that I had to remind him that he was too dark in colour to be acceptable to American society.

SHRI A. D. MANI: There are darker people in South America.

SHRI ARJUN ARORA: I know the att tude of the white Americans towards the dark people, and the experience of Alabama is still fresh.

SHRI BHUPESH GUPTA: Dr. B. C. Roy was not allowed to enter a restaurant, a Chief Minister of ours.

SHRI ARJUN ARORA: Why should such young people who have not been politically orientated—by political orientation I do not mean that they should be orientated in the politics of one party or the other but should have the elementary sense of patriotism, elementary sense of duty to the country—be sent out at all? Unless we are sure of that, no student should be allowed to go abroad.

While the Government is doing a great deal through the CSIR in the field of establishing institutes of higher learivng and research, it is time that it is warned of what is happening at the very base. Science education in schools is merely in name and the Minister for Scientific Research and Cultural Affairs should get conscious of the big drawback. This is the very souree from which you draw and this will be dry one day. I recently had occasion to visit some schools, in fact, my old school also, and I found that the science laboratories had been converted into lecture rooms. A lady who is a teacher in one of the costliest schools in Kanpur told me that though she was a science teacher all that she did was to demonstrate some experiments to the Senior Cambridge students. Scientific education cannot come merely by this sort of demonstration and the students not being allowed to experiment themselves. This is the case in respect of the intermediate and degree colleges. Scientific education in the schools and at the intermediate and degree colleges deserves much better attention and much bigger help than it is receiving.

With these words, Madam, I once more congratulate the Council for what it has done.

SHRI M. RUTHNASWAMY (Madras) ; Madam Deputy Chairman, from the statement of income and expenditure printed towards the end of the Report, we find that on the side of income Government gives Rs. 4,95,00,000 and through donations the Council gets Rs. 6,75,000—in all Rs. 5,35,00,000. Of the donations, I find that only the Andhra Government subscribes about two lakhs of rupees and among the private industrialists only the Birlas contribute about Rs. 50,000. As Mr. Arora pointed out, what are the other industrialists doing? I think Government should make an appeal or put the kind of pressure they can put on private industrialists to make them sit up and take notice of their duties towards scientific and industrial research. Turning to the column of expenditure, I find that pay and allowances of officers takes up as much as three crores of rupees. I do not know whether the officers mentioned here are administrative officers or the

[Shri M. Ruthnaswamy.]

scientists working in the various establishments patronised by the Council are also included. If scientists are included, I think, I would deprecate the use of the word 'officers' to describe them. Scientists are scientists and not officers of any Government.

I also find that the income exceeds expenditure by about Rs. 25 lakhs. On the one hand we find Mr. Mani urging that Government should make more grants to the Council of Scientific and Industrial Research while on the other there is an excess of Rs. 25 lakhs which the Council does not seem to know how to make use of.

With regard to the actual research which lies to the credit of the Council, the Council has sponsored, we find, some research. It is listed here under 'Some Significant Results of Research' and I gather that these must be the most important results of research. We find one in regard to the proteins of Indian pulses—green gram, red gram, black gram and Bengal grams—so as to get more amino acid from them. Then Palu-drine seems to have been researched into as a preservative for *neera* and I believe methods of removal of Palu-drine from *neera* have also been developed. We find also another kind of research connected with the preservation of mangoes and oranges. These are no doubt admirable research but compared to the results of research in other countries they seem to sink into insignificance. I should like to ask, therefore, certain questions. Is there any research sponsored by the Council, in nuclear physics because we have entered on the atonrc age in this country and there should be basic research done in nuclear physics, and also in solid physics? I learn that the study of semi-conductors leading to developments in the manufacture of transistors has been conducted in other countries and it would be useful to sponsor research in this direction. Geophysical research which would be usefu] for the development of mining is another line in which research might be taken up. In other countries oceanographic research has been taken up. It has been found that the ocean bed contains resources in metals like cobalt and copper. We are very deficient in cobalt and copper in our country and I think research in this direction would yield useful results. Meteorological research into the operations of clouds and rain might also be useful in our country, and also biological research with a view to controlling population. Some years ago I read a book called "Geography of Population" I think and there the thesis put forward by a scientist was that rice-eating people are more prolific than wheat-eating or protein-eating people. Now if biological research were conducted with a view to finding some diet which might reduce fertility in our people, it would serve a useful purpose rather than resorting to all those harmful methods of birth control to which the Government seem to be addicted. In regard to applied industral research computers have been highly developed in other countries. They have been used especially in Government Departments, more especially in the Finance Department. Whether our Finance Department will improve its operations as a result of the use of computers I do not know, but it might be tried. Ours being a country of small-scale industries I should have thought that the Council of Scientific and Industrial Research would have paid attention to the discovery of methods and processes of work that would help small-scale industries, that would improve the tools of small-scale industries, like our ploughs, our building operations, etc.

When we compare the investment in science in India with the investments in science in other countries we have a deplorable tale to tell. In England last year as much as £634 million were spent on scientific and industrial research of which private industry contributed 39 per cent, and Government contributed 61 per cent. As a result of this in-

vestment in scientific and. industrial research the industry ther, has benefited to the extent of £ 100 million a year. Oi this investment 10 per cent, has been devoted to basic research 35 per cent, to development of existing processes and 35 per cent, to the discovery of new projects. Five-sixths of the projects in the industrial field were for commercial application.

Now, one interesting question that is raised and dwelt upon often in our debates in this House is about the problem of~highly trained students of science not finding service in our country. Lack of patriotism has been attributed to them but it is not merely financial consideration that persuades our students to seek service in other countries. It is the atmosphere of work that has largely to do with it. In the foreign countries the university is self-contained. There is the academic atmosphere in which the student works. The whole atmosphere of the university or the college is conducive to academic work, to scientific work and to research work Students and teachers talk about their studies, their books, their work, their research, all the time but here there is a lot of distraction especially in large cities like Bombay, Calcutta, etc., and especially in an official-ridden city like Delhi. So, unless we improve the atmosphere in our Universities, unless we make it an academic atmosphere, unless we debureau-cratise our institutions of scientific and industrial research—reference has been made to the administrative work with which scientists are plagued in th's country—unless the scientists are left alone to do scientific work—the administrative work should be in the charge of special administrative officers who can do the dull and drab wofk of looking 'nto files and signing the records that have to be signed—we cannot expect things to improve. It is not merely the financial consideration that keeps many highly qualified Indian scientists away from the country; it is the attitude of the general public, the attitude of the Government, the atmosphere in which they have to work that is largely responsible for the frustration which Indian scientists feel when they return to this country.

4 P.M.

With regard to the work of the Council of Scientific an^ Industrial Research, it is no doubt a noble work, a useful work. But as I said, it must concentrate on research that will be really useful to the industrial development of the country and as this is a country of small industries they should pay more attention to the development of inventions that will help the small industries. If we do that, if they are able to utilise all the money that is placed at their disposal by Government and if they are able to make a successful appeal to private industry so that it may realise its duty in regar^ to scientific and industrial research, I think the work of the Council of Scientific and Industrial Research will show much greater improvement In the years to come.

PROF. M. B. LAL (Uttar Pradesh!: Madam Deputy Chairman, from the Report we gather that after the declaration of national emergency, research programmes of the National Laboratories are to an extent geared to meet defence requirements and a Defence Co-ordination Unit and a steering committee have been formed to push forward that programme. This is no doubt a right step in the right direction. I do feel that this step should have been taken by the Council and by the National Laboratories much earlier than the proclamation of national emergency. We know that since 1951 China had begun to build up its military pressure on India's northern front'ers. In October 1959 it penetrated 40 miles deep into our territory m Lad^kh and by August 1961 it penetrated into India 70 miles deep and occupied about 15,000 square miles of our land. This should have been a sufficient warning to us. I know that there was a research department under the Defence Ministry, but as we all know to our cost, the research department

[Prof. M. B. Lai.]

under the Defence Ministry was not able to cope with the requirements. I am sure that if the National Laboratories had cared to devote some attention to defence requirements, our jawans might have been saved from many hardships that they had to face last October and November. Anyhow steps have been taken by National Laboratories in this matter and I hope that the Council would see that the National Laboratories do not suffer from complacency because the Foreign Minister of Indonesia had recently declared that China has no intention to attack India. Our efforts in that direction must not be slackened.

Madam, in the Third Plan prepared by the Planning Commission considerable stress is laid on co-ordination of research work carried out in the National Laboratories, Universities, technical institutions, laboratories oi scientific associations and research work of Government Departments. I do not know what efforts are made by the Government or by the Council particularly in this direction. If I mistake not, Mere is lack of co-ordination even today and because of lack of co-ordination our result in this field are not as good as they could be if there had been adequate coordination. To me it seems—not to speak of other institutions—there is a certain lack of co-ordination of work even in the case of the National Laboratories. In the Summary of the Third Plan prepared by the Planning Commission it is said that "a large proportion of the inventions made in the country still remain to be exploited. Intervals between the time when the results of laboratory research become available and their wider application are at present considerable, and there is need for more effective action" The Summary further says that "the factors which have hindered vapid utilisation of the results of research appear to be lack of pilot plant facilities and of design and fabrication facilities, inadequate liaison between Industry and research organisations, insufficient attention on the part of :ndustry to the urgent need to secure indigenous production to replace im ported articles, and inadequate co ordination between licensing policies and programmes for the development of research." All these defects are pointed out by the Planning Commis sion in their Summary of the Third Five Year Plan. The Planning Com mission further holds that "'for lack of extended application, full value is not realised from expenditures incur red on research, thereby slowing down the process of technical advance and modernisation." I tried to read care fully the Report of the Council, but I have not been able to find out wnat steps are taken by the Council or by the Government through the Council to see that this lack is reduced and proper utilisation of research is made for our industrial development. I beg to submit that a study of the Report clearly indicates that full value is not realised from expenditure incurred on research. According to the Report the Council's share of royalties and prenva accruing out of processes leased out to industry was Rs. 1,35,584 during 1960, Rs. 1,09,376 during 1961 and Rs. 1,35,907.73 during 1962. A comparative study of the3e three figures will indicate that the Council's share of royalties and premia was less in 1961 than it was in I960. Though the share has to a certain extent increased in 1962 as compared to what it was in 1961, all the same the share amount of 1962 is more or less the same as it was in 1960. Only it was more by Rs. 323 in 1962 than it was in 1960. During these three years the expenditure that we have incurred on scientific research through this Coun cil has considerably increased. While we are increasing expen- diture, the yield through the Council's share is more or less steady. Sometimes it goes down, sometimes it comes to the level of 1960. This is rather not a very good state of affairs, and I feel that it requires careful attention. Madam, nobody can doubt that in a country like India greater stress should be laid on industrial research, on research in applied sciences, than

on research in basic sciences. Nobody can deny the importance of basic sciences, and we are proud of the fact that India has produced scholars like Raman and Krishnan who have contributed much to the development of basic sciences. But all the same, situated as we are, greater stress is needed on researches in industrial problems. Co-ordination between research and industry is very necessary, and I agree with Mr. Arora that our industrialists are not paying as much attention to research as they should pay, but I-wish to point out to this House that even in our public industrial sectors due attention is not paid to this problem. I would make this request through you, Madam, that there should be close association between research workers and public sector enterprises. I feel that if Government pays due attention to this question, if Government decides to spend some amount of the public sector enterprises on research work, research will be promoted and ttere would also be promotion of industrial development.

SHRI N SKI RAMA REDDY (Mysore): Madam, I am very happy that the Annual Report of the Council of Scientific and Industrial Research for the year 1962-63 is being discussed at the present moment. I would like to discuss the Report under three main heads namely, organisation, resources, and work undertaken and results obtained. Speaking of the organisation the Council of Scientific and Industrial Research is extremely fortunate in hav'ng as its President not less a person than our illustrious Prime Minister Shri Jawaharlal Nehru. This shows what great importance «ur Prime Minister attaches to science and research in this country. This is an age of science and technology without the help of which the progress that man can make is very little. Therefore it is in the fitness of things that such an eminent personality presides over this organisation. Secondly, the Vice-President, the hon. Shri Humayun Kabir, our Minister of Scientific Research and Cultural Affairs, is an eminent person by himself, and therefore it is all the more creditable that the services of such an eminent person has been acquired for this purpose. Of course, the Director-General is Dr. S. Husain Zaheer, he is an eminent scientist himself. Therefore, the organisation starts very well. The organisation is quite all right.

I would like in this connection to point out that I am not one of those who believe that mere muitiplicatcn of expenditure will also multiply results. These are not my words. Only the other day Dr. Bhagvantham speaking to a few of us of the Parliamentary Scientific Committee was telling us these things. Certainly expenditure must increase. We have to spend more money on science and research in this country. But without a proper base for scientific research, proper human material for it, merely spending money will not produce results. It must be proportionate to the material that we are having at present. While I am second to none in stressing the need for more money, I would like the hon. Members who criticise the small expenditure on this account to ponder over and find out if the human material 'hat is necessary is there in our country or not.

Only very recently a small note appeared in the "News Weekly", an American magazine, from which we find the magnitude of the scientific personnel that has developed in the U.S.A. as a whol-e. According to the National Science Foundation, those that are engaged in the pursuit of science are 27 million people in the USA. Since 1940 the number has increased five times. The number of scientists in the U.S.A. has increased five times since 1940 because they hava found the necessity of more scientific men, more men who pursue science and research. Therefore, it has increased five times since 1940. Sngineers alone are said to be 1 million; technicians are said to be another million; teachers of mathematics and science are said to be 2J lakhs.

[Shri N. Sri Rama Reddy.] Those who hold Ph.D. and M.Sc. degrees are said to be 5 lakhs. This is the position with regard to the scientific personnel available in America. As against this, in our country according to the Report that is presented to us, there are said to be 1.75 lakhs of scientists all over India. According to the register that has been prepared and given to us, Indian scientists abroad are said to be about. 7,643. Of course, about the scientists that are working abroad enough ha.« been spoken by my friends, and therefore I would not like to speak much about them. It is for the concerned Ministry to make every attempt to bring back all those that are working in foreign countries and offer them attractive terms so that they might come here and help our scientific effort.

We have, according to this Report, 28 National Laboratories, 10 Research Committees, two Research Units and 495 Research Schemes. Therefore, a huge amount of work is being done. We have started very well. Great fillip was given to this organisation's work by the Industrial Policy Resolution that was passed, I think, in March. 1958 or so. That Resolution of the Government of India has given great importance to the scientific work that has got to be undertaken in this country. Accordingly, science has been developing and a network of institutes are spreading all over the country and we , are progressing well. Of course, we cannot produce results overnight, it is impossible. It is a work of science. Very difficult problems connected with nature have got to be tackled and results have got to be obtained. It is not an easy matter to take out from nature's womb things we want for the benefit of mankind. Thousands of people have to work for a longer time and the perseverence should be of the greatest amount. For years and years, people have got to work on certain problems to find results. Therefore, I am quite happy that there is this organisational set-up in our country and we are sure that from year to year we will march forward in our pursuit of science and research and development.

Of course, the organisation is still in a very nebulous condition. It requires years of work; we have to perfect it. I am sure that by and by, at scientific temper spreads all over tht country, people studying science would be coming up. But the results may not be as good as we want them to be. All the same, earnest effort* have got to be made to develop * scientific temper at all levels right from below. Though it m-w not h* very pertinent for me to talk of that aspect of the question, it is absolutely necessary to develop a proper scientific temper in the country. From tht primary school stage we have to pay greater attention to it. I am sure that we are doing something towards ii Everything big is not necessarily tht best. We are going in a very bif way. But for lack of teacher?—and earnest teachers at that—our standards are falling. That also has go* to be borne in mind.

Having said so much, I would likt to say a few words about our finances. I have already said that tht multiplication of expenditure is not the multiplication of results. Certainly, I congratulate the Planning Commission on having set apart Rs. 3* crore$_s$ in the Third Five Year Plan a» against Rs. 20 crores only in tht Second Five Year Plan, for thi$_s$ Council. Rupees tw$_0$ hundred crores w»» the figure given by my frined, Shri Mani, with regard to the entire work connected with science and research. For the Second Five Year Plan only Rs. 20 crores had been set apart and for the Third Five Year Plan Rs. $5 crores have been set apart. Probably, under the stres$_s$ and strain of . .

(Time bell rings.)

I have only finished speaking about the organisation.

THE DEPUTY CHAIRMAN; Back ten minutes.

SHRI N. SRl RAMA REDDY: I d» think that the amounts that have been set apart are quite good and according

to the requirements of the times, and much can be done with those amounts.

Now, coming to the work undertaken and the results produced, I just want to say this. Of course, I do not know what amount of co-ordinf tion there exists between all these organisations that are working all over India, the Defence Science Organisation, the Indian Council of Agricultural Research, etc. But I think scientific effort is a little frittered away here and there, in every department, i ao not want to enter into that discussion at the present moment. But what I would like to know is whether some o'f these institutes are tackling any problems so far as applied research is concerned. I am not talking of fundamental research. Oertpinly, fundamental research is very necessary for -any progress. Whatever amounts are spent on fundamental research, I do not grudge them. Coming to the practical ₛide of it—applied science, as it is called—I would like to know the position. There are innumerable problems facing us, they are not tackled on the basis of pragmatic necessity. That is what is happening.

I would like to know one thing. You are importing three million tons of kerosene oil into this country. There is plenty of vegetable oil available in the country. All [our] ancestors managed with the available vegetable oil. But we are importing now three million tons of kerosene oil at considerable foreign exchange. Is it not possible to develop a simple lamp so that the local oil that is available can be used, giving the same brilliance as the kerosene oil lamp? We have been unable to solve this very simple problem. Is there not one technologist in all your 28 Laboratories who can produce a small lamp which can burn brilliantly with the help of our local vegetable oil? Castor oil is there or what we call *honge* oil is there. There are any number of oils. An these oils could be used, they are going to be used. I do not want to go into the details.

Now, coming to . . .

THE DEPUTY CHAIRMAN: Tho time is over. It is a two-hour debate, Mr. Reddy,

SHRI N. SRI RAMA REDDY: I will take only two minutes.

THE DEPUTY CHAIRMAN: I cam give you only one minute more. Please wind up.

SHRI N. SRI RAMA REDDY: So far as applied science is concerned, I am not quite happy over the position because processes utilised by industry for production are only eight; processes leased to industry are only seven; and processes ready for industrial utilisation are only ten. Of course, previous year's work is also tagged on to it. Only very little has been released to the industry by this Council. It *ie* very poor.

I wnat to point out another thing. There is a Corrosion Committee. It i« said that during the Second Five Year Plan, Rs. 21 crores were lost due to corrosion of various steels stored by the Railways. In the Third Five Year Plan, it is estimated that Rs. 45 crore* are going to be lost. What has beea done about some of these things, I would like to know.

It is said in this Report that the Botanical Gardens, Lucknow, have produced a citrus plant so dwarf that it could be grown in a pot in the house. I have not seen one anywhere in thii country. I do not know if our Minister has got potted citrus plants. Ho has made a claim about it, and he must show us at least. Another thing li about the gibberellic acid; ' 1 in-a million part applied to rice plants is supposed to increase the growth three or four times. Why is nothing of that sort done? Some claim has been made but that is not given in detail at all.

I have a number of things to point out but you are not pleased to giva me any more time. Anyway, there i* no proper co-ordination and the result* that are obtained are not many.

श्री विमलकुमार मन्नालालजी चौरडिया (मध्य प्रदेश) : उपसभापति महोदया,

[श्री विमलकुमार मन्नालालजी चौरड़िया]

जो रिपोर्ट प्रस्तुत हुई है, वह कौंसिल आफ साईंटिफिक एण्ड इण्डस्ट्रियल रिसर्च के बारे में है और आज देश को इन खोजों की कितनी आवश्यकता है, इसके बारे में दो मत नहीं हो सकते । जब तक इन्वेन्शन नहीं होते, रिसर्च नहीं होती, तब तक मनुष्य का जीवन और सुखमय बन सके, यह सम्भव नहीं । मनुष्य ज्यादा से ज्यादा सुखमय जीवन कैसे बिता सके, अपनी रक्षा कैसे कर सके और ठीक तरह से जीवन कैसे व्यतीत कर सके, यह काम हम सब खोज के द्वारा ही कर सकते हैं । राष्ट्र की सुरक्षा का भी बहुत बड़ा भार रिसर्च विभाग के ऊपर है; किन्तु अभी जो लड़ाई हुई उसमें ऐसा देखा गया कि हम अपने काम में पीछे हैं, बहुत पीछे हैं और हमारा रिसर्च का काम बिल्कुल ही ठीक है, ऐसा नहीं कहा जा सकता है । किसी भी क्षेत्र को ले लीजिये, कुछ इने गिने क्षेत्रों को छोड़ कर, संसार में जितने रिसर्च हो चुके हैं, उन मामलों में हम बहुत पीछे हैं, इसमें दो मत नहीं हो सकते हैं । अभी भी यह आवश्यक है कि हमारा यह रिसर्च का डिपार्टमेंट चले, रिसर्च की कौंसिल कायम रहे और रिसर्च का काम चलता रहे, परन्तु जो व्यय हम करते जा रहे हैं, जो काम हमको करना चाहिये, साइन्टिस्टस की इनर्जी का जो उपयोग हमें लेना चाहिये, उसमें ठीक तरह से कोआर्डिनेशन कर पा रहे हैं, ऐसा लगता नहीं; साइंस का काम भी, रिसर्च का काम भी, हमारे मन्त्री महोदय या कौंसिल वाले शायद ऐसा समझते हों कि जैसे ५ बजे की घंटी बजी कि रिसर्च का काम बन्द हो जाना चाहिये और ११ बजे फिर रिसर्च का काम शुरू हो जाना चाहिये, किन्तु वह हो नहीं सकता ।

श्री अकबर अली खान : ऐसा नहीं होता है ।

श्री विमलकुमार मन्नालालजी चौरड़िया : कई जो रिसर्च करने वाले हैं वे लेबोरेटरी से छः-छः, सात-सात, और आठ-आठ मील दूर रहते हैं—लेबोरेटरी होती है उनके घर से आठ मील दूर—कैसे वे रिसर्च कर सकते हैं ? उनकी घर जाने की इच्छा होती है कि हम खाना खाकर आवें और इतनी देर रिसर्च का काम ठहर नहीं सकता ।

श्री अकबर अली खान : आप रकम दें तो बिल्डिंग भी उनके लिये वहीं बना दें ।

श्री विमलकुमार मन्नालालजी चौरड़िया : प्रार्थना यही है, सुझाव यही है, यह आपकी समझ में जल्दी आ गया, यह मन्त्री जी समझ जायं तो ठीक हो । तो निवेदन है कि रिसर्च करने वाले जितने साइंटिस्ट हैं, जिनको हम अप्वाइंट करते हैं, उनको लेबोरेटरी के बिल्कुल नजदीक रखना चाहिये, उन्हें दूर नहीं रखना चाहिये, ऐसी व्यवस्था हम जब तक नहीं कर सकते तब तक हम उनका पूरा उपयोग ले सकेंगे, इसमें मुझे पूरी शंका है; इसलिये सबसे अधिक ध्यान हमको इस बात का देना चाहिये ।

एक और बात देखने में आई कि हमारे यहां पर एक कमेटी नई कायम की गई है, डिफेंस कोआर्डिनेशन यूनिट—

to look after work of the Steering Committee for co-ordination of scientific research for Defence.

एक पहले से स्टीयरिंग कमेटी बैठी है कोआर्डिनेशन करने के लिये डिफेंस वर्क को और उसके लिये फिर एक डिफेंस कोआर्डिनेशन यनिट कायम की गई है । इसकी जो स्टीयरिंग कमेटी है, उसके चेयरमैन हैं डाइरेक्टर साहब और इसके भी शायद वही रहेंगे मगर एक कोआर्डिनेशन कमेटी को कोआर्डिनेट करने के लिये दूसरी कमेटी बैठे, तो कुछ समझ में आता नहीं । फिर सब के ऊपर रिसर्च कौंसिल है और यही सब कोआर्डिनेट करने को है । उसके भी अधिकार और फंक्शन लगभग वही हैं, जो कि इस कोआर्डिनेशन कमेटी के हैं । तो इस तरह से इस दिशा में भी कुछ विचार किया जाना आवश्यक है ।

दूसरे एकाउण्ट्स के बारे में माननीय रत्नस्वामी जी ने काफी कहा है । मगर कुछ समझ में नहीं आया कि इसके बैलेन्स शीट में व्हेकिल और ट्रांसपोर्ट के बारे में जो एमाउण्ट दिया गया है वह गत वर्ष भी यही था और इस वर्ष भी वही है । तो क्या बुक वैल्यू उसकी घटी नहीं या डैप्रिसिएशन उसका काटा नहीं जाता ? क्या एक साथ इसको रइट आफ करेंगे ? क्या इसका लक्ष्य है इसके बारे में मन्त्री जी प्रकाश डालेंगे तो ज्यादा अच्छा होगा ।

इसके साथ साथ यह निवेदन है कि यहां पर खर्चा इसका बढ़ता जा रहा है । खर्चा बढ़ने के लिये आपत्ति नहीं है, मगर जो रिजल्ट हम प्राप्त कर रहे हैं वह कुछ समझ में आने सरीखा नहीं है । जैसा मणि साहब ने बताया, सूर्य के रश्मि से हम भोजन पका सकेंगे, ऐसी हमारे यहां पर रिसर्च हुई, बड़ा प्रकाशन हुआ और काफी अखबारों में उसके बारे में निकला, मगर उसके बाद उसका हम कुछ लाभ ले सकें, कोई प्रैक्टिकल उसका उपयोग हमको देखने में आता नहीं । केवल प्रचारमात्र के लिये हमारे यहां पर काफी रिसर्चेज का काम हो जाता है जिससे कि हमारे वे साइंटिस्ट भी जस्टीफाई कर सकें और डिपार्टमेंट भी जस्टीफाई कर सके कि हमने कुछ किया, मगर हम एक्चुअल में कुछ देख पाते नहीं ।

तीसरे साइंटिस्ट्स में आपस में प्रतिस्पर्धा होती है और प्रतिस्पर्धा के परिणामस्वरूप जो काम उनको करना चाहिये वह हो नहीं पाता । एक दूसरे को नुकसान पहुंचाने की भी प्रवृत्ति कहीं कहीं देखी गई । इसके ऊपर भी प्रतिबन्ध अत्यन्त आवश्यक है । सेन्ट्रल ड्रग रिसर्च इंस्टिट्यूट लखनऊ में किसी साहब ने चूहों पर एक्सपेरीमेंट किया और उनका एक्सपेरीमेंट कुछ सफल होने की स्टेज पर आ रहा था, तो किसी दूसरे साहब ने प्रतिस्पर्धा के कारण, ऐसा कार्य किया कि उन चूहों को स्लो प्वाइजनिंग कर दी जिस की वजह से उनका सारा एक्सपेरीमेंट उपयोग में नहीं आ सका और फिर प्रारम्भ से उनको उसे करना पड़ा । तो इस दिशा में भी हमको कुछ करना पड़ेगा ।

एप्वाइंटमेंट्स के बारे में लोगों की बड़ी शिकायत है । एक तो पब्लिक सर्विस कमिशन की मार्फत सारे एप्वाइंटमेंट्स शीघ्रातिशीघ्र होने की ठीक व्यवस्था होनी चाहिये, वह हो नहीं पाती । इस दिशा में भी कुछ ध्यान देना अत्यन्त आवश्यक है । दूसरे, एप्वाइंटमेंट्स में कभी कभी एकदम इतने हाई ग्रेड्स दे दिये जाते हैं कि किसी की तनख्वाह ६०० से एक दम एक हजार पर पहुंचा दी और किसी की १६० रु० हो तो ६०० रु० पर पहुंचा दी । कुछ उनकी उपयोगिता का आधार भी देखना चाहिये । कोई नया स्टूडेंट हो तो वह रिसर्च नहीं कर सकता, ऐसा मैं नहीं मानता, वह भी रिसर्च कर सकता है । मगर इस दिशा में भी कुछ ध्यान दिया जाना आवश्यक है ।

सेंट्रल रोड रिसर्च इंस्टिट्यूट यहीं दिल्ली में है और उसका कर्तव्य है कि वह रोड्स के बारे में स्टडी करे कि कौन कौन सा मैटीरियल डालने पर कितनी मजबूत रोड बन सकेगी, कहां पर ट्रैफिक की क्या व्यवस्था हो सकती है, किस ढंग से रोड बनानी चाहिये, कितने टर्न्स देने चाहिये, वगैरा वगैरा । मगर ऐसा देखने में आता है कि दिल्ली प्रापर में भी रोड्स की ऐसी खराब व्यवस्था है कि उसको भी स्टडी करने की इस रिसर्च इंस्टिट्यूट को फुर्सत होगी, इसमें मुझे शंका है। दस साल इसको लगभग हो गये, मगर दिल्ली की ही रोड्स को ठीक करने की दिशा में इसने अभी तक कुछ किया हो ऐसा कुछ लगता नहीं ।

रेडियो रिसर्च कमेटी हमारे यहां पर है । एक प्रश्न के दौरान में कल ही पता लगा कि कोई डाक्टर एस० दत्त हैं और उन्होंने यह क्लेम किया है कि वे ५० रु० में ट्रांजिस्टर सेट बनाने को तैयार हैं और राजस्थान में एक रॉक हमको मिली है । तो हमारे डिपार्ट-

[श्री विमलकुमार मन्नालालजी चौरड़िया]

मेंट ने उनको वही रैडटैपिज्म के आधार पर पत्र लिखा जब उनकी अर्जी आई कि हम विचार कर रहे हैं। यह नहीं किया गया कि उनको कॉल करके उनका जो भी नमूना हो उसको देख कर कहा जाता कि तुम्हारा यह सक्सफुल हुआ तो हम तुमको इतना इनाम देंगे । खुद कौंसिल या जो कमेटी है रेडियो के सम्बन्ध में वह अगुवा हो के, इनिशिएटिव ले करके, इस मामले में आगे बढ़ करके और दत्त साहब को बुला करके फाइनलाइज करे इस बारे में कि कहां तक उनका कहना सत्य है या असत्य है और उसके बारे में तुरन्त निर्णय लेकर काम करे, मगर वह होगा नहीं । चार पांच महीने हो गये और अभी हमारा यहां पर जवाब यह है :

> "फिर भी पता चला है कि सहायता अनुदान के लिये डा० दत्त के एक प्रार्थना-पत्र पर वैज्ञानिक तथा औद्योगिक गवेषणा परिषद् विचार कर रही है। जब तक इस उपाय का अन्तिम रूप से मूल्यांकन" वगैरह, वगैरह . . .

तो अभी तो यहां पर यह डिपार्टमेंट विचार कर रहा है इन चीजों में डिले करने से कोई लाभ होता नहीं और जल्दी उसका निर्णय लिया जाना चाहिये । इस लिये यह अत्यन्त आवश्यक है कि इस दिशा में भी हमारी सरकार कोई कदम उठायेगी तो ज्यादा अच्छा रहेगा ।

अंत में यह निवेदन कर दूं कि साइंटिस्ट, जिनकी इच्छा सचमुच जीवन उसमें देने की है — केवल तनख्वाह के लिये वे काम करने आते हैं इस दृष्टिकोण से आने की अपेक्षा जो अपना जीवन इस रिसर्च के काम में देना चाहते हैं— उनको सिलेक्ट करके रखा जायेगा तो अधिक अच्छा होगा । उनकी खोज के प्रति आकर्षण पैदा करने की आवश्यकता है किन्तु उनमें जो प्रतिस्पर्धा की भावना है उसको समाप्त करना चाहिये । केवल मैं आगे बढ़ूं यह भावना होनी चाहिये, मगर एक दूसरे से ईर्ष्या रख करके उनको नुकसान पहुंचाने की भावना हो, इस पर प्रतिबन्ध लगाना आवश्यक है और उनको खोज के प्रति आकर्षण के लिये उनको प्रोपर एप्रिसिएशन समय समय पर, उन्होंने जो थोड़ी बहुत खोज की है, उसके लिये दिया जाना अत्यन्त आवश्यक है ।

इस सम्बन्ध में यह भी अत्यन्त आवश्यक है कि जहां पर लेबोरेट्री हो वहीं लेबोरेट्री के पास हों उनका निवास-स्थान बनाया जाना चाहिये जिससे उन पर यह प्रतिबन्ध न लगे कि ५ बज गये, इस लिये घर जाओ, अब रिसर्च नहीं कर सकते । रिसर्च का काम ऐसा है कि उसमें खाना पानी सब भूला जा सकता है । अगर कोई आदमी उसमें मशगूल हो जाय उस स्थिति में सब फैसिलिटीज हमको देना अत्यन्त आवश्यक है । मगर आज रिसर्च करने वाले लेबोरेट्री से आठ आठ और दस दस मील दूर रहते हैं । बम्बई में भी यही हालत है, यहां भी यही हालत है और सब जगह यही हालत है । तो इस दिशा में हमको व्यवस्था करना अत्यन्त आवश्यक है ।

जो भिन्न भिन्न लेबोरेट्रीज हैं उनका कोआर्डिनेशन करने की अत्यन्त आवश्यकता है । प्राइवेट सेक्टर वाले भी करते हैं, हमारी गवर्नमेंट की तरफ से भी हो रहा है । हमारे मित्र अरोड़ा साहब ने आरोप लगाया कि प्राइवेट सेक्टर में कुछ होता नहीं, मगर मैं उनसे मतभेद रखता हूं क्यों कि कोई भी व्यापारी हो वह अपना उद्योग चलाने के लिये यह अत्यन्त आवश्यक समझता है कि कम से कम उसमें खर्च हो और अधिक से अधिक बचत हो और उसके लिये वह कोशिश करता है । इस लिए कोआर्डिनेशन करके हमें अधिक से अधिक लेने का प्रयत्न करना चाहिये, यही मेरा निवेदन है ।

THE MINISTER OF SCIENTIFIC RESEARCH AND CULTURAL AFFAIRS (SHRI HUMAYUN KABIR) : Madam, I am grateful to the hon. Members who

have taken part in this discussion. I was very happy to find that the approach of every one who participated has been constructive and helpful, This is an occasion where, I think, there is a concensus of opinion in the House, and though there may be differences in details, the broad perspectives and the objectives have been common among all sections of the House. That is what we all expect in a matter so abstract and impersonal as research and so vital in importance from the point of view of national security and prosperity as science.

Madam, the various points which have been raised can be grouped into a number of broad heads. I think I will take from my hon. friend, Mr. Sri Rama Reddy, his broad division and try to put under them the remarks of the different hon. Members who have taken part.

Shri Mani went into great detail. Obviously he has made a careful study Of this Report, but occasionally he seemed to overlook that the Council of Scientific and Industrial Research is only one among many organisations. In the Government of India alone there are four or five different major organisations looking after different sections of research. There is the Defence Science Organisation. There is the Indian Council of Agricultural Research. There is the Indian Council of Medical Research. There is also the Atomic Energy Commission. And there is, of course, the Council for Scientific and Industrial Research. Therefore, when we talk of organisation, we have to think of the organisation of all these different groups together. While I admit that there is some need for co-ordination, I would also like to place before the House this point that the pursuit of co-ordination should not go too far in the case of science. Research cannot be co-ordinated in the way in which many other activities can be and are co-ordinated. In research, there must always be an element of individual initiative. In a sense, there is a paradoxical position so far as research is concerned. On the one hand no research scientist today, in the existing state of knowle.'ge can hope to make a break-through entirely on his own. He must depend on the co'laboration and co-operation of many fellow-workers and yet on the other hand, without individual initiative, without the individual genius, any major break-through does not take place. So, we have to balance these two things.

When we look at the history of science in the past, we find that sometimes the attempt at co-ordination has led to undesirable results. If there had been too much insistence on co-ordination, there would not have been integral calculus and differential calculus. Some great administrator would have said, "Since Newton is working on the problem, Leibnitz should not be allowed to do so." In that case, the world would have been much poorer because the two great scientists worked on the same problem but with a different background and different approach and came to different conclusions. Similar things are happening even today in the free field of science. Though the problem appears to be the same, different scientists working independently come to different conclusions and we must never forget this fact.

Shri Mani referred to the question of resources and pointed out that in India we spend Re. 1 per head per annum. I am sorry to say that it is not even Re. 1 per head per annum. The total allocation for scientific research in the Third Plan is about Rs. 130 crores and with Rs. 70 crores of committed expenditure, the total which the Government of India will be. according to the present Plan, spending on research will be roughly Rs. 200 crores, that is Rs. 40 crores a year and the population of India, as everyone knows, is about 45 crores. The figures for China are certainly higher than that and that is why we have been insisting that we must also increase our allocation. The Scientists' Conference which was held recently made a recommendation that

fShri Humayun Kabir.] roughly 1 per cent. <>f the national income may be allocated for research. That would give us at present approximately Es. 145 crores and it may, in course of time, go up to Rs. 200 crores by the end of the Third Plan.

The point about the allocation of resources is one where I am entirely at one with every Member who has spoken except hon. friend, Shri Sri . Rama Reddy. His was the one voice in this House which thought that the resources were adequate. I do not know wherefrom he obtained this information. I say, certainly Re. 1 per head per annum or less than that is not on any account adequate, and I am sure that all the other Members of the House who pleaded, that this should be increased considerably, if not five times as we would desire, at least three or four times, are certainly in the right.

Shri Mani raised another basic question in this connection and a number of other speakers returned to that po'nt—the relation between fundamental and applied rsearch. Whatever Prof, Blackett may say, fundamental research has its importance for every economy and even for what are called underdeveloped and undeveloped economies. If We concentrate only on applied research, we cannot get the best results even in applied research. There may be difference of opinion about the proportion. In England, among the different scientific organisations, we find that there are different allocations for different purposes. In Defence Science, for example, England spends only about one per cent, of it resources on fundamental research, it spends only, as far as I recollect, about 15 or 20 per cent, on applied research and the balance she spends purely on development. As opposed to that, the Universities spend a major part on fundamental research whereas the Councils, whether it is the D.S.I.R., that is, the Department of Scientific and Industrial Research, or the Medical Research Council or the Agricultural Research Council, spend about 25 to 30 pier cent, on fundamental research. They have recognised from experience that without fundamental research, applied research itself is not effective.

One of the reasons why Germany had a great break-through in the seventies of the last century and became one of the most highly industrialised countries within the course of about 20 years wa$_s$ her attention to fundamental research. Today in America in one of the major industrial organisations, about 500 physicists are working on pure fundamental research which has no relation whatever to the particular problems of that industry and yet the results of fundamental research sometimes give unexpected results. Take the question of nuclear power and atomic energy. These have developed as a result of fundamental research, not applied research, and therefore I would not agree with Mr. Mani that we should neglect fundamental research and apply all our attention to applied research, though I would agree if he says that in our country there should perhaps be in the National Research Councils and the Laboratories a somewhat greater emphasis on immediate practial problems and a somewhat lesser emphasis on fundamental problems.

Shri Mani in that connection referred also to the cow-dung plant and solar cooker. This was a little surprising because this is a case of applied research and this is a case where one of our very valuable materials can be fully utilised. This research in cow-dung plant guarantees that you get the energy out of the cow-dung without in any way losing its use as a fertilizer. In fact this is what my scientist friends tell me that as a result of this cow-dung gas Plant, the nitrogen and other mineral contents are concentrated. Nothing is wasted but in addition you get some power, some energy which will be utilised and if this programme can be successfully implemented, it will go a long way in solving one of our major problems.

About the solar cooker, I think I have told this House before that this is a matter which is in its experimental

stage. If undue publicity was given to it at one stage, that was a mistake. I think no one in this House can say that for the five years that I have been associated with this Ministry and with the C.S.I.R., I have referred to solar cooker unless someone provoked me to do so. My reply has always been that it has not yet been fully worked out. and until we can solve the allied problem, the problem of finding out a battery, a battery in which energy can be stored in a compact and economic manner, the solar cooker will not work for the simple reason that people want to cook every day and every night throughout the year and the sun is not available throughout the year in that way. Human beings are not like camels that they will feed for one day and go on that food for seven days. So unless we can find a proper battery, I do not think . . .

SHRI AKBAR ALI KHAN: If it is solar energy, how can they cook in the night?

SHRI HUMAYUN KABIR: That is the reason why the problem may be attacked from a different side.

Then Shri Mani referred to coordination of, the relation bciween the Indian Institute cf Petroleum and the O.N.G. Commission. Perhaps, he is not aware that it was largely at the instance of the O.N.G. Commission that this Institute has been established and the two are working very closely. In fact many of the personnel are common. The O.N.G. Commission is concerned with the day-to-day problems whereas the Petroleum Institute will be concerned with the basic research problem of the petroleum and petro-chemical industries. The general view throughout the world appears to be that there should be, what may be called, operating laboratories, work-a-aay laboratories, attached to every Ministry to deal with routine and operational problems but wherever any basic problems are involved they should not be in the charge of any laboratory attached to the Ministry concerned. Any Ministry which is dealing with a particular programme is so pressed by urgent day-to-day problems that if these research laboratories are attached to them, they cannot pay attention to the basic problems and in that way there may be national wastage.

Shri Mani also cautioned against premature publication. I entirely agree and that is why we would rather be cautious and not give our results before we are sure. I think it is a fact that the National Laboratories jointly and severally have made a distinct contribution to the development of national industrial life of which you will And many instances in the Report which has been given. I would like to inform the House that we are preparing a simple document for the layman, which will give some account of what the National Laboratories have achieved till now. This book is now in the press and I hope to place it on the Table of Parliament before the end of this Session, if it is possible, but certainly at the next Session of Parliament so that all hon. Members may have some idea of what the National Laboratories have done in the course of their existence. I would like the House to remember the oldest Laboratory is only 12 or 13 years old. The National Chemical Laboratory and the National Physical Laboratory, the two earliest laboratories, started functioning about 1950 and 13 years is not a very long period in the life of a laboratory. In the case of some of the others, the period is much shorter. Therefore, you cannot expect very spectacular results from them.

Mr. Mani also referred to consultations with industry. Here I would say that we have taken a number of measures for establishing closer liaison with industry. If you look into this Report, ycu will find in the Report towards the end of it, an account of some of the steps which have been taken. My friend—I think it was Prof. Lai—said that nothing much had been done in this direction, although he had read the Report carefully. I do not know if he went up to the end of the Report. If he had gone beyond

[Shri Humayun Kabir.] page 18 h_e would have found from page 20 onwards, some account given about industrial liaison and expansion of scientific personnel which would deal with some of the points raised by him. Briefly, I may tell the House that these are some of the measures we have taken. Everyone of those National Laboratories has a governing body or an executive council which has on it representation of industrialists and commercial people interested in that particular industry with which the laboratory is concerned. In addition, the National Laboratories have extension services. There is an extension service with the Leather Research Laboratory and we have had very warm appreciation from the industry, of the help which research in this laboratory has given to the industry, to both small-scale as well as large-scale industry. Similarly the Glass and Ceramic Research Institute has also helped with their services. So far as the National Metallurgical Laboratory is concerned everyone who knows about the development of our steel industry knows that but for the help of the National Metallurgical Laboratory, we would have had to spend crores more on foreign exchange and also we would not have had commensurate results. Most of the difficult problems of the industry have been solved in this Laboratory. Similarly in the Fuel Research Laboratory at Jealgora, they are doing some processing with coal and they are working on a problem which is basic to our industrial development, We have a'most unlinrted reserves of poor coal, but our reserves of metallurgical coal are very limited and the Jealgora Institute is working on the problem of avoiding waste and how comparatively poorer quality coal, by proper blending, by mixtures and washing, can be made to serve some of the metallurgical purposes. Therefore, it would not be true to say that there is no liaison with industry. I would certainly agree that the liaison should be still closer.

One hon. Member—I forget who it was—said that unless there are more pilot projects in operation, and the industry got results, they could not develop these processes purely from the laboratory findings. That is also a fact which we have recognised. Very recently, more emphases has been given to the development of pilot plants in the different National Laboratories. The budget for pilot plants in the year 1963-64 will be about Rs. 80 lakhs. So far as pilot plants are concerned, the budget formerly was less. It waa Rs. 44 lakhs in 1960-61 and Rs. 70 lakha in 1961-62. Unfortunately it went down in 1962, partly because one major project at Jamshedpur had been constructed and therefore, in this particular year the figure came down to some extent. But in 1963-64, we have a provision of Rs. 80 lakhs for pilot plants. In addition, we have also strengthened this industrial liaison unit and we have created a designs unit in the C.S.I.R. so that pilot plants can be designed and we can advise the industry on proper utilisation of the results of research through the fabrication of equipment which is necessary for the purpose.

My hon. friend Shri Mani also referred to a scientific service. There are difficulties about a scientific service, unless it be a purely educational service. Even in a purely educational service, there are difficulties, because different scientists cannot be equated together. So are you going to have a service for physics, another service for chemistry and yet another for biology? There are many difficulties of this kind. In any case we are awaiting the report of the Mahalanobis Committee which was appointed sometime ago and which is going into the whole question of the structure and nature of a scientific service.

Mr. Mani raised another point to which I think almost every speaker referred in one way or the other. Why is it that some of our research scientists go abroad? The number, as I said yesterday, and I would repeat it, is not very large and I think my hon. friend Shri Arora also referred to the fact that the number who actually go away is very small. Some of

them may be very good. But we are not losing more than 2 per cent, of those who are trained abroad. It is not 2 per cent, of the scientists trained. here, but 2 per cent, of those who are trained abroad, whereas the proportion in a country like the United Kingdom is about 10 to 12 per cent of those trained in the U.K. itself. They are losing their Ph.D.s. at the rate of 10 to 12 per cent. Why is it that scientists go away? It is not merely a question of emoluments. I do not think emoluments are a major consideration. The major considerations are two or three other things. Firstly, today unless a man is working in a team, it is very very d·fncult to achieve significant results in a short time. In our country these teams unfortunately, do not yet exist in sufficiently large numbers. Even when we are trying to build up teams, unfortunately an element of personal equation comes in which dees not operate to the same extent in other countries. We are, I think in our country, greater individualists than perhaps the scientists in most other countries. Often it is a case of every scientist for himself, I will not say who should take the hindmost. And because there is lack of team spirit, some of the younger scientists prefer to work abroad, because there they can make their contributions immediately and make a name for themselves. This has actujl-ly happened.

There is also greater academic freedom enjoyed by scientists. Here the Government has nothing to do with it. So far as the Government is concerned, we are trying to take measures to give the greatest measure of freedom to the scientists. We are in fact now taking steps t_0 abolish different grades of scientists. In the C.SJ.R. there were a number of officers, the Director-General, the Deputy Director, the Scientific Officers, Assistant Directors and so on and so forth. Now, the proposal is being examined and I think we will be able to give effect to it, to place all of them in one category as Scientific Officers, may be of different grades. They will -all be Scientific Officers, but on different grades. I hope this will help in the creation of a more democratic spirit.

There is also the question of facilities. We are a poor country and thai fact cannot be denied. Many of tha material and equipments necessary *toe* research today are very expensive, so very expensive that even the richest countries find it difficult to finance them completely. I found in the United Kingdom, where the Universities have been extremely jealous of their autonomy, where they do not want to enter into co-operative pro jects for research, they have been compelled by the logic of circumstances to have to agree to have one—I forget the exact name of it, it is not exactly a cyclotron—one accelerator of a special type which will cost £ 10 million Because one single equipment cost3 £10 million, the Universities have agreed to work in co-operation with the Atomic Energy Establishment, because each University cannot afford to have an equipment of that type.

It is not only with regard to expensive equipments. Even in the case of comparatively cheaper equipments, we have to import them and till the industrial base of the country is raised we cannot successfully meet this problem.

5 P.M.

My hon. friend, Shri Mani, also raised the question of the status of scientists and of National Professors. I think National Professors have a very high status and the recognition given to the National Professors has certainly helped in raising the status of scientists. I would agree with him that much more remains to be done in this direction, but that depends not only on the Government, not only on a Minister or a Council of Ministers but it depends on the general social climate in the country. In creating that general social climate, every Member of the Parliament has a role to play. If we can create that condition in the country where educated and learned people are recognised for their own sake, if we

[Shri Humayun Kabir.] can create an atmosphere where dedicated teachers are honoured above others, certainly we shall get a far larger influx of talent in the scientific and other departments of intellectual pursuit.

Shri Mani referred also to the question of supervision of scientific education. I regret I do not agree with him that the Council should supervise scientific education. This again is a matter for the Universities and there is the University Grants Commission. The Council should certainly offer facilities and the major function of the Council is to promote applied research and help fundamental* research but education in schools and colleges is different and if the Council undertook that task, it would be undertaking more than it can properly manage and it would really be encroaching upon the function of others.

I was rather surprised that Shri Mani was unhappy that we should publish in Indian languages. I think, on the contrary, till we can publish on a much larger scale all kinds of text books, general scientific literature, popular books, popular magazines and every kind of scientific literature in every Indian language, we cannot create a proper scientific atmosphere in this country.

SHRI AKBAR ALI KHAN: But he was talking about terminology.

SHRI HUMAYUN KABIR: Terminology, in the case of science, is not very much of a problem because such terminology is international. We have to use international terminology because any attempt to concoct any new kind of terminology will create a great bar to the progress of science. Science is not merely learning a few terms. Much of the work in the modern day is done through journals, bulletins and brouchures, Unless a person is completely familiar and is fully able to utilise all the information in the journals, research bulletins and brochures which appear from time to time, unless he is at home, he cannot make any contribution and, therefore, if there are two sets of terminologies, it will 'add an undue burden on the memory of school children and college students. Therefore, scientific terminology, scientific formulae, scientific symbols must be universal and must be the same for all the countries of the world, if science is to progress. That has been the experience of other countries which have been experimenting with this sort of thing. In the Soviet Union, I have found that scientists who do not know any Russian can pick up enough Russian for scientific purposes in about two months or so for the simple reason that when they look at a scientific bulletin in Russian, they will find seventy to seventy-five per cent, of words that they would have used in English or French or German or in any other language. The same experience is in Arabic and the same experience is in Japanese. I believe the Chinese also follows the same pattern though I confess that we do not have sufficient experience of Chinese publications at the present time.

Allocation of resources is a point which I have already dealt with and I hope that the demand that was made at the Scientists Conference will be met, if not fully, at least substantially. We asked for one per cent, which would come to about Rs. 145 crores. For this year, the allocation for scientific research in the Government of India's Budget is only Rs. 40 crores. I agree with a number of speakers who have said that we cannot step up suddenly. That is why we have taken a realistic programme. In the Scientists Conference the demand was that we should have thirty thousand research scientists in place of fifteen thousand in the course of the coming five years and I am quite confident that this can be done provided we take the necessary steps.

My hon. friend, Mr. Mani, also raised the question of evaluation of research. I should like to say that I accept that in principle and we are trying to do that continuously. I think this House is aware that we have already decided to appoint a very -high-powered com-

mittee to review the working of the CSIR as a whole during the last eight er ten years. That committee, or com-aiission or whatever you may like to call *it, will* siart working in November this year, I think, and when it gives us an evaluation of the work of the different National Laboratories and of the CSIR as a whole, we may accordingly frame our future programme. But I would not agree with my friend, Mr. Mani, when he says that we should invite experts every two years to judge the publications of the different scientists of this country. Assessment in scientific work is a continuous process. Kvery paper which is published, if it la worth while, immediately attracts notice througout the world. I am sure that hon. Members of this House will be glad to know that sometimes papers published in our journals have a demand from all over the world and we have sometimes had to reprint these articles in order to meet that demand. Members of this House would be glad to hear that the work done in this country has received universal acclaim. Very recently, one of our workers for the work which he did on cholera, has received recognition in India and outside as one of the foremost workers in that field in the world. One friend, I think it was Mr. Ruthnaswamy, referred to the question of population control.

SHRI AKBAR ALI KHAN: Do you five some reward to such people who do such work?

SHRI HUMAYUN KABIR: My hon. friend will be glad to hear that he was, as far as I remember, a Senior Scientific Officer and today he is a Deputy Director which meant a lift of something like a thousand rupees; he was drawing Rs. 800 or Rs. 900 and he got Rs. 1600 in terms of money but far more in terms of honour and distinction. We have made it a rule that for meritorious work there will be no question of routine promotion. 'Whether there is any post or not, a post will be created if a man has done outstanding work and where a man has done good meritorious work, he will be given recognition by means of advance increments, of which again we have given a large number.

One friend, I forget if it was Mr. Chordia or Mr. Sri Rama Reddy, objected to our giving a higher start to some of our scientists. Now this, I think, contradicts what all the others had said. Most of the speakers wanted that the scientists should be well paid and if you want to attract promising scientists and keep them in the laboratories, you have to give them terms which are acceptable to them. There is no point in stinting fifty or twenty rupees in choosing valuable scientists.

SHRI N. SRI RAMA REDDY: It was not I that said this, Sir.

SHRI HUMAYUN KABIR: I am glad.

As I was saying, Sir, appraisal goes on day by day. We judge the quality of papers by the number of references to that paper in text books, in scientific journals and this is almost a sure test. Therefore, this idea of inviting people every two years or so, I think, is not desirable and not necessary.

I am happy that for once I am almost completely in agreement with my hon. friend, Shri Bhupesh Gupta. For once we have spoken with the same voice and though he had one or two comments to make here and there, most of the things he said were extremely useful and valuable. I agree with him and with other Members who have spoken about the paucity of funds. He asked whether our progress is adequate. Here again there is room for honest difference of opinion. We believe that the laboratories in the conditions under which they are working have made fair progress, whether it is adequate, I cannot say. Results do not always show it immediately. Sometimes there have been mistakes and I think this hon. House will accept this position that in research if I spend or if I indulge in a hundred different items, and ten of them lead to results,

[Shri Humayun Kabir.] it is not unsatisfactory. If you beforehand prescribe that every research must necessarily yield results, I do not think any scientist will undertake research at all. No one can give a guarantee like that. Research arises mainly because of two reasons. There are some people who have that inqui-sitiveness and that impluse, that irresistible impluse for research and they will go on carrying out research. We find that a man may have worked for ten years on a problem and failed again and again and in the eleventh year he may succeed. Sometimes it may be twenty or twentyfive years and if we say that we want results immediately, I think many of these researches would have been stopped. So, I hope that the House will be generous in this matter of research and not demand that results must be shown immediately. Shri Gupta asked if there was adequate number of engineers and technologists in this country and if we were producing them in sufficient number. He was not in the House yesterday when I said that we were well within the margin of requirements of this country. In tact. I believe we have a slight excess and I would like to have a slight excess because that would again imple people to take up new types of work and help in the industrial development of the country.

SHRI AKBAR ALI KHAN: Still we are far behind modern countries like the Soviet Union, the U. K. and the United States.

SHRI HUMAYUN KABIR: I think it would be premature for us to compare ourselves just now with countries like the U. S- A., Soviet Union or the U.K. The United Kingdom has a lead of 300 years; the United States has a lead of over 100 years. And the Soviet Union, not Soviet Union, but Russia has a lead of 150 years.

SHRI AKBAR ALI KHAN: Not . Soviet Union?

SHRI HUMAYUN KABIR: But the Soviet Union has not come out of the blue. All the work of the Nobel Prizemen, of the great scientists and of the great industrialists who flourished there before 1917 was not wiped out. Hon. Members very often forget that even before 1917 Russia was one of th* great Powers of the world and if there was any country of which the British Empire in the height of its power was afraid, it was the Russian Empire of those days. That fact is very oftee forgotten. Therefore, we cannot compete with these countries or with France or with Germany. They have all had a lead over us but I agree that we should use our resources to the best possible extent and see how we can develop fast. Of course, if we develop too fast then there is the danger that the quality may suffer and I am sure the House will not desire this.

But one statement of my friend, Mr. Bhupesh Gupta, astonished me. He said that out of four scientists who had come back to India three returned Out of four scientists who got trained abroad three went back. This is, I should say . : .

SHRI BHUPESH GUPTA: I read out the quotation from "The Hindujrta* Times."

SHRI HUMAYUN KABIR: I would only say that this is a gross exaggeration. As I said, of the scientists whe have been trained abroad and have returned to this country not even twe per cent have gone back. Three out of four means 75 per cent. But it ie not even two per cent. We have actually collected the figures—I do not remember the figure at the moment—but I gave the figures to the conference of scientists. It is less than two per cent that have gone back because they were dissatisfied. There are a large number of our scientists abroad; I do not deny that fact. But some of them are undergoing training; some of them have gone as visiting professors and a certain amount of circulation of scientists like that is botk desirable and beneficial to our country.

Then my friend Mr. Gupta referred to the question of administrative responsibilities of scientists. I confess that here I myself face certain d'fflculties. The scientists sometimes complain of the'r administrative responsibilities but I can also assure you that if these administrative responsibilities are taken away from them they feel even more unhappy. It is a common saying not only in this country but in other countries as well, are the scientist* going to be on top or are they always going to be on tap? Scientists want to exercise a number of powers. Regarding files, there are files and files. There are certain typas of files where without a proper scientific background a man cannot function at all. I think we have to reconcile ourselves to this position that to some extent scientists will have to undertake administrative responsibilities but I agree that they should not indulge in routine activities. They should delegate to others the power that is given to them. The Director of a National Laboratory is the Head of the institution. Nobody prevents him from delegating as much power as he wishes. In fact we are encouraging the delegation of powers and therefore the appeal should be to the scientists that they should delegate the powers and not try to •xercise all those powers themselves.

My hon. friend Mr. Gupta also referred to the fact that even men without academic qualifications may do good work. 1 agree. When the results are there in the form of published papers we do give due recognition. Now, what is the way of recognising? Academic career is some kind of criterion. If there are publications that is some kind of criterion. I get letters almost every day from people from all over the country making sometimes fantastic claims of soving problems which till now have never been solved and which according to some scientists are incapable of solution. I have received a number of letters from a number of persons who say that they have devised an engine which will run perpetually without any kind of fuel,- not even water. Well, if such an engine can really be devised it is something phenomenal. I have written back to them saying, 'if you have devised this engine .take a patent and you will become a multi-multi-multi-millionaire in no time.' But you cannot always expect all our scientists to spend their time in scrutinising this kind of things. Whenever there is anything which has the least promise, we always ask our scientists to examine it and they do examine that with' a great deal of sympathy.

SHRI M. RUTHNASWAMY: The Minister was going to say some thing about the research on population but in the meanwhile he was disturbed bj an interruption. Will he now say that?

SHRI HUMAYUN KABIR: A certain amount of work is being done in that field in two of our National Laboratories, at Lucknow and at Calcutta and both have attracted notice even outside the country. Very recently, I heard that one of the scientists working at Calcutta has found out soxn» kind of an oral contraceptive which ii expected to be almost fool-proof, almost 100 per cent successful but we can't say anything till we get a propel scientific assessment. As I said earlier, I do not wish to give premature publicity and sometimes as a result of premature publicity the scientific work suffers and the reputation of the laboratory may come down. That work is being continued and if that is accepted by the scientific world, I shall myself come and tell the House with pride that this work has been achieved. The attempt is there and that is all that I can say at this moment.

DR. M. M. S. SIDDHU: May I know from the hon. Minister whether it i» not a fact that the work at the Central Drug Research Institute at Lucknow for the last four years has been on cadmium chloride to produce sterility? And if I were to go through the Annual Reports of the Council of Scientific and Industrial Research, *I* find it is just a duplication of the same

[Dr. M. M. S. Siddhu.]

thing again and again. I have myself gone through the last four Reports.

SHRI HUMAYUN KABIR: I shall certainly have this looko:'. into but I would only mention this. We recently had an offer of very substantial help from abroad for carrying on this work »nd if that work did not have promise, why should they have come forward with this, help? They are all scientists and nobody is willing to part with hard cash in substantial amount unless they think that the work has promise. As I sad, I am not a scientist myself and therefore I cannot pass any judgment but the point raised by my hon. friend will certainly be examined.

Mr. Gupta also referred to some un employed scientists. There are un fortunately some unemployed scientists but this House knows the measures we have adopted. We have got the scientists' pool. We offer not only an allowance but opportunities for work to any qualified s The number has recently been increased. It was originally 100 and we had made it 500 earlier this year. Now we have decided that there should be no linr'ta-tion of number provided the scientists with requisite qualifications come to take advantage of this pool.

THE DEPUTY CHAIRMAN: How much more time would the Minister need?

SHRI HUMAYUN KABIR: I think another fifteen minutes or so. ActuaUy, Madam, there is a Cabinet meeting. May I then, if you would agree, finish it on Monday?

THE DEPUTY CHAIRMAN: No, no. This is a two-hour discussion.

SHRI HUMAYUN KABIR: Then I will be very brief.

So far as my friend, Mr. Arora, is concerned, I would very largely agree with him—he is now gone away. I think it is true that industry does not pay sufficient attention to research and it does not employ sufficient scientists but, I think he was perhaps a little too hard on them. They do something. For example, he referred to the ATIRA as the only one of the textile research associations. There are already functioning. There is one at Coimbatore, the CTRA, there is another in Bombay, the BTRA and one in U.P. may be coming up. And eleven more, what we call, co-operative research associations have already been established where we give half the capital and recurring cost as grant and the other half of the capital cost and the recurring expenses are given by th$_e$ industry. I however, agree with him that industry should pay far more attention to research and it will pay them. It is one of the most satisfactory investments that any industry could undertake.

SHRI N. SRI RAMA REDDY; I would like to know about Prof. Raman's institute. It is not mentioned in this Report.

SHRI HUMAYUN KABIR: Ptor. Raman's Institute has nothing to do with the C.S.I.R. Prof. Raman is one of our National Professors and the institute gets help when it requires from the Ministry.

SHRI SANTOKH SINGH (Delhi): May I know if it is a fact that in every industry useful research work is already going on as applied to industry and that they have got to do it for tneir own sake?

SHRI HUMAYUN KABIR: I agree, but that is for the industrialists. I cannot give an answer. We would certainly welcome it and we have made an open offer that in the case of any industry which organises research on a co-operation basis, we shall assist them by giving fifty per cent as capital grant subject to a maximum and fifty per cent of the recurring expenditure.

Then, Mr. Arora referred to the question of selection of students and said that we should not select on aca-

demic grounds. My difficulty is that I do not know of any other ground, [f I go on any other ground, I am sure that hon. Members of this House will be justified in attacking me. What other ground can I havie.

SHRI BHUPESH GUPTA: Papers may have been published by them.

SHRI HUMAYUN KABIR: So far as publications are concerned, they are always considered. In the case of scholarships, generally they are at a level where they have no time for publications. Students should certainly t>e patriotic and we do try to give some kind of orientation. But this is again a question of the general atmosphere in the country. My conviction is that here also my friend Shri Arora was a little too pessimistic. Our students are by and large patriotic. They are proud of the achievements of India and what India is doing especially after Independence. That is why the majority of them return. As I said, less than two per cent are lost to us.

He also raised a very important question about science education in schools. I entirely agree with him. I am afraid that here again the Council as such can do nothnig. It is a matter for the State Governments and the educational authorities in the States and at the Centre.

There is one rather curious point raised by my friend, Mr. Ruthna-swamy. He was surprised that there were Rs. 25 lakhs not spent at the end of the financial year. I should have thought that an organisation which is spending about Rs. 5J or 6 crores a year should not be a pauper at the end of the year. After all, even at the end of the year there should be at least one month's money to carry on. Therefore, it should not be Rs. 25 lakhs, but more. Unless an organisation has some money in its coffers, how is it going to meet its day-to-day requirements? I was surprised because he is an experienced administrator. I am ¸ure that if in his University on the 31st March the figure showed an empty till or a minus, he would have been most unhappy.

Shri Ruthnaswamy also talked about nuclear physics. It is being looked after by the Atomic Energy Commission.] Solid state physics is one of the major concerns of a number of laboratories. Some work is being done in the National Physical Laboratory and the National Chemical Laboratory. The Defence Science Laboratory is also doing it. If he had read the Report, he would have seen oceanography also. For the first time in our history we are giving it a fairly big place. The Indian Ocean expedition started last year. India is one of the participating countries and with international co-operation we expect that fairly soon in oceanography also we shall be able to find valuable material for us both industrially and scientifically.

SHRI N. SRI RAMA REDDY: Will you please tell us something about rain making?

SHRI HUMAYUN KABIR: There is a unit working on rain and cloud physics. This again is an experiment which, firstly, is very expansive and Secondly, one where you cannot give results immediately. Some of the preliminary results, which we have seen from experiments carried out both at Agra and at Delhi, have been promising. I would not go beyond that. These experiments have been carried out in Australia for a number of years. I think in spite of the fact that they have been working for five or six years they cannot say that they have solved the problem. Attempts have been made in California in America. These are being persisted with and we hope that a day may come—when I cannot say—when we shall have some control over rain and clouds. I do not think we will attain complete control at any time.

Then, I agree entirely with my friend, Mr. Ruthnaswamy, that there should be an atmosphere of complete academic freedom in laboratories and Universities. We are doing everything possible to encourage that.

My friend, Mr. Lai, raised also a curious point. He said if there is a co-ordinating unit . . .

SHRI M. RUTHNASWAMY: Before he goes on to the next point, may I ask him how he explains this excess of income over expenditure?

SHRI HUMAYUN KABIR: Because there must be some money at the end of" the year to carry on for another month. It is an obvious thing. You cannot have a zero in your coffers on the 31st March.

SHRI M. RUTHNASWAMY: As much as Rs. 25 lakhs?

SHRI HUMAYUN KABIR: When your budget is approximately Rs. 6 crores, what is the expenditure in one month? I though I had already dealt with that point in some detail.

My friend, Mr. Mukut Behari Lai, was rather surprised that there is a co-ordinating unit when there is a steering committee.

PROF. M. B. LAL: I did not say so, I was not surprised at all. I was glad that you have established it.

SHRI HUMAYUN KABIR: I am sorry. It was Mr. Chordia. He was surprised. Obviously he did not realise that the steering committee consists of the heads of seven different organisations. In order to make the work of the steering committee possible, a coordinating unit in the C.S.I.R. is essential. Mr. Lai asked: Why it was not set up earlier? I agree. We did not do it earlier and it was wrong. But if we had rectified a wrong, I think he should not be unhappy.

PROF. M. B. LAL: I am glad. My first sentence was that we were glad. I am not unhappy. I am only sorry that you did not do it earlier.

SHRI HUMAYUN KABIR: I agree that it should have been done earlier, but now we have gone a step further. For the first time, we are now setting up an advisory body on science which will bring all the different research councils, all the different research organisations together, so that there can be some kind of overall survey of scientific work in the country. I hope that this body, when it is set up— which I hope will be before this month is over—will be able to advise us how to use our funds and our resources in man-power most economically and most effectively.

I think I have dealt with almost all the points. One other point raised by Mr. Lai was the time-lag between research and application. There will always be some time-lag. I have already mentioned some of the measures which have been taken to see that the time-lag is reduced.

PROF. M. B. LAL: I am sure that this fact to which our attention is drawn by the Minister must have been noted by the Planning Commission. All the same the Planning Commission complains about it.

SHRI HUMAYUN KABIR: Well, it is odd that the Planning Commission should complain, because it is also a part of Government. It should do the thing. I do not believe in any Ministry or any part of the Government making complaints in public. We should try to do what ought to be done instead of complaining.

PROF. M. B. LAL: I do not know why the Planning Commission dare do so against the wishes of the Minister.

SHRI HUMAYUN KABIR: I would agree with him that in the public sector there should be greater research. In fact this has already been taken note of by the Ministries concerned and they are setting up research units. I hope that very soon we shall see that the public sector industry does not lag behind any other sector in providing facilities for research.

I think, Madam, I have covered all the points. There are only two points raised by Mr. Chordia.

THE DEPUTY CHAIRMAN: Just two more points.

SHRI HUMAYUN KABIR: TWO more points. He wanted that hostels should be built for research workers ...

SHRI AKBAR ALI KHAN: Staff.

"SHK HUMAYUN KABIR: . For the staff and the research scholars in the laboratories. I wish we could provide accommodation for everyone. You know the housing problem in the country generally. We are trying to provide accommodation for laboratory workers as far as possible and a very expensive programme of construction has been taken in hand.

Then, he asked something about vehicles and why no depreciation has been shown. The reason is that in accordance with the decision of the Government, no depreciation can be shown on vehicles or transport. This is just the Government's way of accounting and there is nothing mysterious about it.

Madam, I hope I have answered every point which was raised. In conclusion I would again say that I have appreciated very greatly the spirit in which ail the Members who have taken part have spoken.

THE DEPUTY CHAIRMAN: Mr. Mani, do you want to say anything?

SHRI A. D. MANI: Madam Deputy chairman, I shall take only seven minutes to reply.

THE DEPUTY CHAIRMAN: Why seven minutes?

SHRI A. D. MANI: Because I have got two points to make. I am just dividing time. Madam, I am much obliged to all the speakers who have taken part in the debate and also to the Minister who has given what I may call a complete reply to all the points raised. Whether we are convinced by his reply or not is left to the Members concerned to say, but he has tried to answer all the points that were raised. I would like to refer to something that was said in reply to Mr. Ruthnaswamy's remarks about Rs. 25 lakhs being the surplus available to the Council. He said that the Council must have some money at its disposal. I do not think that it is a correct answer to the question. I would refer him to page 38 of the Estimates Committee's report, 27th Report, wherein the Committee points out that under fellowships and scholarships the full grant has not been utilised, and the Ministry replies to the Estimates Committee's observations on these lines.

SHRI HUMAYUN KABIR: This is 1962-63.

SHRI A. D. MANI: Yes, current one. They say that they will ensure that the estimates are realistic and that the provision will be fully utilised. So, there is room for us to believe that all these estimates have not been properly planned and that there has been under-utilisation of the money given to the Ministry.

Madam, I would like to mention that the Minister has stated that much depends upon the atmosphere we create for scientists in the country and that in the creation of the atmosphere Members of Parliament as well as others have to bear the responsibility. I would like to mention here that one of the complaints made by scientists in the country is that they are being treated as Government servants and ordered about. Here is a quotation from a speech made by Dr. Bhagavan-tam, Scientific Adviser to the Ministry of Defence, who addressed a group of Members of Parliament two days ago. According to a newspaper report Dr. Bhagavantam said that the implementation of the scientific policy resolution moved by the Prime Minister in Parliament on March 4th, 1958, had been rather slow; scientists should have more freedom to do research work in the way they liked and the authoritarian way did not promote science. Dr. Bhagavantam said that.

SHRI N. SRI RAMA REDDY: I do not think that is correct.

SHRI AKBAR ALI KHAN: He was present there.

SHRI A. D. MANI: This is a report from the "Hindu" of Madras which is known for its fairly accurate reporting.

SHRI M. SATYANARAYANA: The "Hindu" representative was not present. It was only a meeting addressed by Dr. Bhagavantam of Members of Parliament.

SHRI A. D. MANI: He seems to have said this, unless Members sa$_v$ that he did not make such a statement.

SHRI AKBAR ALI KHAN: Mr. Reddy was there.

SHRI A. D. MANI: Whatever he may or may not have said, the general feeling is that they are being treated in the "North Block" way, that they are not given the respect that is due to them. If they feel that they are not being respected as men of science, the proper atmosphere for science will not grow in this country.

I would like to wind up by saying that in regard to private industry Mr. Arora said that private industry had not contributed much to industrial research. He put it, as the Minister observed, in rather harsh terms. I believe that private industry particularly in the manufacture of art silk has contributed much towards industrial research. I recently visited the CIBA Research Centre at Goregaon in Bombay set up by the CIBA Pharmaceutical Works, which is a very grand project for the conduct of medical research in this country. I do hope that the co-operation of industrialists will be forthcoming in a more generous measure in the future and that our scientific development will be strengthened. Thank you.

THE DEPUTY CHAIRMAN: The House stands adjourned till 11 A.M. tomorrow.

The House then adjourned at thirty-three minutes past five of the clock till eleven of the clock on Friday, the 6th September, 1963.