THE MINISTER OF STATE IN THE MINISTRY OF INDUSTRY (SHRI CHARANJIT CHANANA): (a) and (b) The information is being collected and will be laid on the Table of the House.

श्रीमती रत्न कुमारी : श्रीमन, जैसा कि हम सभी जानते है, हमारे देश में मध्य प्रदेश राज्य ऐसा उदाहरण है जहां बहुत कुछ किया जा सकता है और किया बहुत कम गया है। इस प्रदेश का भूभाग इंगलैंड, जर्मनी और जापान इन सभी देशों के भूभाग से अधिक विस्तृत है, उत्तर में चम्बल से ले कर दक्षिण में गोदावरी तक फैला हुआ है। यह बहुत ध्यान देने योग्य है कि इस मध्य प्रदेश में संसार में सब से अधिक आइरन ओर, डायमंड, कापर, कोल, बक्साइट और मैंगनीज के भण्डार उपलब्ध हैं, परन्तु इसी प्रदेश के लोग संसार में सब से ज्यादा गरीब हैं। मेरा पहला प्रश्न है कि मध्य प्रदेश राज्य में कितने जिलों को औद्योगिक दृष्टि से पिछड़ा हुआ घोषित किया गया है? उनकी प्राकृतिक सम्पदा के दोहन के लिए सरकार इन जिलों में कोई हल्का या भारी उद्योग लगाने का विचार रखती है क्या ?

SHRI CHARANJIT CHANANA: Sir, I have already replied to the question that the information is being collected and it will be laid on the Table of the House.

(Interruptions)

DR. BHAI MAHAVIR: Mr. Chairman, this is a very strange way of dealing with the House. The question is very simple: is there any proposal before the Government? Let him say 'yes' or 'no'. What is the information to be collected?

SHRI CHARANJIT CHANANA: I shall request the hon'ble Member to read the question which says:—

"whether there is any proposal under Government's consideration to set up any heavy industry . . ."

The Government consists of various Ministries and several other institutions. We have already requested all of them. It is not under one umbrella. or one Ministry that the information has to be collected. We have already requested all of them.

MR. CHAIRMAN: Mr. Minister, whether it is under ten umbrellas or two umbrellas makes little difference. Is it under consideration or is not under consideration? That is the question.

SHRI CHARANJIT CHANANA: Data is being collected. Without collecting the data it will not be proper on my part to say whether or not...

DR. BHAI MAHAVIR: It is a question dealt with by the Industry Ministry.

श्रीमती रत्न कुमारी : श्रीमन्, मेरा प्रश्न यह है कि क्यों सरकार को विदित है...

MR. CHAIRMAN: If you are collecting material it is obvious that the matter is under consideration. Why not say so?

SHRI CHARANJIT CHANANA: The matter is under consideration. Sir.

MR. CHAIRMAN: Next question.

Solar energy research

@*224. SHRI KRISHNA NAND JOSHI:†
SHRI BISHAMBHAR NATH PANDE:
SHRI PRAKASH MEHROTRA:

Will the PRIME MINISTER be pleased to state:

@Previously Starred Question 85 transferred from the 17th March, 1980.

†The question was actually asked on the floor of the House by Shri Krishna Nand Joshi.

(a) whether there is any proposal to orient the country's science and technology in the field of solar research;

(b) if so, what are the details in this regard; and

(c) if the answer to part (a) above be in the negative whether Government purpose to start a solar energy research programme in the country in the wake of world-wide energy crisis?

THE MINISTER OF STATE IN THE MINISTRY OF DEFENCE AND DEPARTMENTS UNDER THE CHARGE OF PRIME MINISTER (SHRI C. P. N. SINGH): (a) to (c) A Statement is laid on the Table of the House.

Statement

Utilisation of Solar Energy:

The most important renewable source of energy for mankind is the Sun—especially for India where there is an abundant supply of sunshine. Government of India therefore propose to accord high priority to the development of technologies for utilisation of Solar Energy for a wide range of applications with special emphasis on its use on a decentralised basis particularly in rural areas. The Department of Science & Technology has already taken up a coordinated programme of systematic R&D in solar technology, by availing of the infrastructure facilities and expertise existing at the various institutions in the country such as the institutes of Technology National Laboratories of the CSIR, R&D Division of the BHEL, Central Electronics Ltd., and other; this programme has as its objective R&D that can lead rapidly to practical.

The current activities of the Department seek to expand the programme with special emphasis on the following three main areas of solar technology.

(a) Development of Solar Thermal devices and systems based on the thermal effects of radiation;

(b) Development of Photovoltaic devices and systems for direct conversion of Solar energy into electricity;

(c) Bio-mass and bio-conversion technology.

Solar Thermal Devices:

In the area of solar thermal devices, development of solar collector technology is being actively pursued. Top priority has been accorded to improving efficiency and cost effectiveness for different specific applications. The programmes includes development of corrosion resistant materials for absorber plates, use of selective coatings and paints to improve efficiency of collectors, fabrication of parabolic surface and paraboloid dishes and tracking systems. Basic technology for flat plate collectors has been developed with a view to commercialisation.

Prototype grain dryers of different capacities have already been developed and these are at present undergoing field trials. A 10-tonne per day capacity solar grain dryer has been installed under the auspices of DST at the Central State Farm near Ludhiana by the NIDC. A small capacity solar dryer of 500 kgs per day capacity for cash crops such as ginger, arecanut, turmeric etc. has been installed at Gauhati. A project for tobacco drying using solar energy has also been initiated in Andhra Pradesh. Further development of solar dryers for agricultural and food products is envisaged alongwith their widespread utilisation.

Several types of solar water heating systems are being developed. Performance evaluation of the experimental solar heating systems put up by BHEL at Qutab Hotel in Delhi and Guest House at Hardwar, is underway. Meanwhile, with the experience already gained, a solar water heating plant is being put up at the Leprosy Hospital, Pune and one more Unit is being planned for the Andhra Pradesh

Diary Development Corporation at Warangal. It is now proposed to promote solar water heating systems for wider application in domestic, commercial and industrial establishments.

A solar powered Cold Storage Plant with absorption refrigeration system has been completed at the Indian Institute of Technology, Bombay; the plant is under performance evaluation. Design, development and fabrication of a few more solar powered refrigeration plants are planned under the DST programme for optimising the engineering parameters.

A short term and long term test programme of the 10 KW Solar Thermal Power Plant already installed at the IIT, Madras jointly with BHEL, is being undertaken. Solar Thermal Power plants based on different system configurations and collectors are also planned. Demonstration power plants for decentralised application are proposed to be installed in the next three years.

In order to give a dynamic thrust towards large-scale and commercial application of solar thermal technology, the Department has since formulated a major and comprehensive project for setting up a Centre for Prototype and Product Development, including field trial and demonstration in rural areas, of solar thermal devices/systems. The Project is estimated to cost around Rs. 6 crores over 5 years.

Photovoltaic devices and systems:

The basic technology for direct conversion of solar energy into electricity by photovoltaic cells has already been developed. The main problem now is to bring down the cost per peak watt of electricity by this method to a reasonable level, and this is the primary objective of the current DST Programme in this area. This could be achieved: (a) by developing low cost solar grade silicon material and low-cost techniques of fabrication and (b) by improving the efficiency of solar cells and panels. The programme in this area has so far successfully resulted in the fabrication of single crystal silicon cells at the laboratory scale by the Central Electronics Limited (a Public Sector Undertaking under DST) with participation of research groups in IITs, National Laboratories, Universities etc., Solar Photovoltaic modules developed at CEL are currently being used in the Lighthouse Beacon at Dwaraka Port for ship navigation, for pumping water in the solar distillation plant at Awania village in Gujarat and in a few demonstration pumping systems. Future programme envisages scaling up the fabrication techniques for silicon solar cells and panels developing modules for applications such as pumping of drinking water, minor irrigation, community lighting, for educational radio and TV sets, cathodic protection of oil pipelines and for use in communication equipment in remote areas. A major project costing about Rs. 9.5 crores over 5 years, including large-scale application of photovoltaic system in rural areas for a variety of purposes (with emphasis on water pumping for drinking and minor irrigation), has been drawn up. Simultaneously R&D work has been taken up for developing different types of solar cells such as polycrystalline silicon cells, MOS cells, Cadmium Sulphide cells, etc. as also concentrator system for solar panels with a view to improving cost-effectiveness and efficiency. It is proposed to expand the application of photovoltaic systems for drinking water, irrigation etc. starting this year.

Conversion of Bio-Mass INTO Energy:

In recognition of the importance of R&D in the area of bio-gas systems, a time bound All India Coordinate Programme involving several inter-disciplinary research centres such as Planning Research and Action Division (PRAD) of the UP Govt. at Lucknow, KVIC, Structural Engineer-

ing Research Centre at Roorkee and the Central Building Research Institute and other organisations was initiated by the Department of Science and Technology a few years ago. In phase-I of the programme considerable success has been achieved in the utilisation of organic waste, primarily animal dung and a few designs of viable family size bio-gas plants have been evolved. "Janata" drumless plants and feroo-cement gas holders have been developed, and research work in the micro-biological aspects has been shown promising results.

A major and dynamic thrust is now being given by the DST to develop family and community-size biogas plants as an important element in the rural energy matrix. In the future phase of programmes, which has commenced this year, more emphasis is being placed on expanding the installation of community size biogas plants, as well as family type plants and the utilisation of other types of solid wastes/materials like vegetable wastes and agricultural residues. Initially 6 community size bio-gas plants would be developed in selected villages by PRAD, Lucknow and KVIC. In support of the coordinated project, work is underway in resolving other technical problems concerning microbiological aspects, formentation technology, low cost construction techniques and materials, and low cost devices and engines for bio-gas utilisation.

Various programmes are under way to explore the utilisation of agricultural residues or biomass to provide renewable energy sources for the future; here solar energy is made use of through photosynthesis and the biological chains. DST has constituted a National Steering Committee to examine, identify and formulate R&D Programmes related to production of Biomass and conversion of Biomass to fuels/feedstock, specially keeping in view the abundant supply of solar energy. Two projects—project on bioconversion of methane to methanol and another project for studying conversion of callulosic material to ethanol have been taken up at the IIT, Delhi. Also a project for introduction, screening, cultivation of potential pettrocrops and their conversion into Petroleum hydrocarbons has been initiated by the DST at the National Botanical Research Institute, Lucknow jointly with the Institute of Petroleum, Dehra Dun. Since the entire R&D chain in this areas will have a long gestation period, efforts are to be started now to have the technology readily available in the reasonable time frame. The use of biological systems by harnessing solar energy would be very effective mechanism, specially to check environmental pollution, resources depletion and promotion of decentralised energy supply.

In general, it is proposed to give a fresh impetus and priority to the programmes for development and harnessing of renewable energies and their widespread utilisation.

A Cabinet Committee on Energy has been constituted which will *inter alia* monitor the progress achieved in fuller utilisation of renewable energy sources like solar energy.

SHRI PILOO MODY: Between the two of them they should make up their mind as to who is in charge of solar energy.

SHRIMATI INDIRA GANDHI: Mr. Mody.

SHRI PILOO MODY: I am only the solo part of it.

SHRI KRISHNA NAND JOSHI: Sir, the hon'ble Minister has given exhaustive and valuable information to the House on the utilisation and use of solar energy and that it is being accorded high priority. A Cabinet Committee on Energy has also been constituted to monitor the progress achieved. Sir, a study of "Earthscan" a U.N.-sponsored agency based in London, has warned that big companies in the west have begun to

dominate solar industry. It is reported that there are signs of the solar know-how coming under the control of major trans-national corporations of the world who already have a stronghold on other technologies. It adds electricity generation and irrigation pumps are the major growth areas in the developing world and it is precisely in these areas that the west is taking a lead.

Apprehension is shown in certain columns of the press that U.S. multinationals, through its Indian collaboration, may be allowed to import a hundred American solar pumps at the cost of Rs. 50 lakhs, even though State-owned Central Electronics Ltd., has developed its own pump which also uses photo-voltaic (PV) cells. It is further apprehended that in the long run the market will be flooded with sets built with U.S. technology.

It is also pointed out that it will greatly affect Indian solar pumps which are not only cheaper but more advanced because they can run on cloudy days as well. My question, as such, is:

Will the hon'ble Minister be pleased to state:

(a) whether the Government of India has taken any steps to block the entry of multi-nationals in areas in which indigenous know-how already exists or can be developed;

(b) whether the Government has initiated any move with a view to making solar technology available to the third world free of cost, as an UNCTAD study has suggested?

SHRI C. P. N. SINGH: Sir, at present there is nothing before the Government regarding these multi-nationals trying to block our programme.

SHRI KRISHNA NAND JOSHI: The Director of the Indian Council of Agricultural Research Institute in a recent Indo-Soviet Symposium on physiological aspects of increasing potential productivity of cereals held in Delhi on 13th December, 1979 said that "Solar energy equivalent to about 10 barrels of oil was available in a day on an acre of land. This enormous amount of energy should be effectively harnessed by bringing about physiological changes in plants." Sir, will the honourable Prime Minister be pleased to state whether the Government proposes to accelerate the research to utilise solar energy in bringing about physiological changes in plants and fix biological nitrogen?

SHRIMATI INDIRA GANDHI: We are deeply interested in promoting solar energy. Various experiments are going on. It is being used already for various purposes, but very much more work still needs to be done to make it competitive. In the long run it is competitive but immediately it is more expensive. I personally have been deeply interested in this matter for many years and am glad to say that it is being taken up in a big way.

SHRI BISHAMBHAR NATH PANDE: Sir, the Prime Minister has stated that she was deeply interested in the research work in solar energy and I remember that in December, 1975, while inaugurating the silver jubilee celebration of the National Physical Laboratory she said that she was very much interested and she was happy that the National Physical Laboratory has seriously undertaken the research work in solar energy. I want to know how much progress the National Physical Laboratory has made after that, in these three years, in its research work on solar energy. I know that the Janata Government did take interest in organic research in the problem of urology but I would very much like to know what research work has been done by the National Physical Laboratory in the field of solar energy.

SHRIMATI INDIRA GANDHI: Sir, it is not possible for me to quantify the work done by the National Physical Laboratory at this time, but I

should like the House to know that the Department of Science and Technology has taken up a very systematic and co-ordinated R and D programme in solar technology by availing of and strengthening the infrastrucutral facilities and expertise existing in the various laboratories and institutions, in the IITs in the National Laboratories, in the R and D Division of BHEL, Central Electronics Limited and other such organisations. Solar technology is still at the R and D stage and there are several problems to be overcome in regard to collection, conversion and storage of solar energy, particularly to make the new technology cost-effective. Some of the solar energy devices have been demonstrated to be technically feasible such as water and air heating systems, solar driers for agricultural products, solar refrigeration units, solar protovoltaic system for micro-irrigation etc. However the techno-economic viability of such systems and devices has to be increased by continuous research and development including field evaluation trials of pilot plants and demonstration models in order to increase efficiency, reliability and to bring down the costs.

श्री प्रकाश मेहरोत्रा : नार्मल इलेक्ट्रिकल एनर्जी की प्राइसेज आज एक इन्टरनेशनल प्रोब्लम है। इस वक्त सोलर एनर्जी एक इनएग्जास्टेबल सोर्स है और इस देश में प्लेन्टीफुली एवेलेबल है तो मैं यह जानना चाहता हूं कि प्रायोरिटी हमारी क्या है और किस फील्ड में सोलर एनर्जी का उपयोग करने का सरकार का विचार है ? दूसरी बात यह है कि सोलर एनर्जी को इलेक्ट्रिकल एनर्जी में कन्वर्ट करने के लिये क्या प्रयास हुआ है और कमर्शियल लाइन पर या किस लाइन पर इस तरीके की एनर्जी बनाई जा रही है ? और अगर है तो उसकी कास्ट जो है वह नार्मल इलेक्ट्रिक एनर्जी के मुकाबले कितनी पड़ती है ? दूसरी बात मैं यह जानना चाहता हूं कि दूसरी कन्ट्रीज में, जैसे यू० एस० ए० और स्वीडन आदि में, जहां पर इस क्षेत्र में काफी काम हुआ है, उनके साथ इस बारे में एनर्जी का क्या कोई आदान-प्रदान हो रहा है और यदि वह हो रहा है तो किस फील्ड में हो रहा है ?

SHRIMATI INDIRA GANDHI: We are giving the greatest importance to the use of solar energy for agriculture, *i.e.*, for pumps, for increasing the yield improving the variety and so on. We are in touch with a number of countries with regard to the work which has been done there; and I have already said that a considerable amount of work is being done in different parts of India. Earlier, a Member asked about the National Physical Laboratory. Its work is on the production of cheap solar grade silicon and solar collector.

SHRI MANUBHAI PATEL: Sir, in view of the exhaustible energy resources in the country, we are suffering from so many energy problems. The Prime Minister has just now announced that the Government is going to pay attention to produce these things in a big way. Now I can understand that, as far as the sophisticated materials for scientific work and scientific research are concerned it may take a long time. But, as far as the uilisation of solar energy for domestic purposes is concerned, sufficient research has been done. For example, the Khadi and Village Industries Commission have successfully invented a solar cooker for cooking purposes. Then Jyoti Ltd. of Baroda have invented solar water pumping—which were exhibited in the exhibition which I saw—for irrigation purposes in the fields. Then I would like to know whether it is possible to replace these electric batteries by solar batteries where we are running short of petroleum products, etc. From the moon they ran a jeep with that battery. I would like to know whether we could replace that. Then it could be used for water heaters. I think there was a water heater of this type in the Prime Minister's house, I would like to know whether these different item which could be utilised for domestic

production will be developed. In view of the recent statement by the Prime Minister that they are going to produce these things in a big way, will they give priority to these domestic appliances?

SHRIMATI INDIRA GANDHI: Sir, we are fully aware of the items and the institutions which the hon. Member has mentioned. Many institutions, firms, hotels and private individuals are using solar energy. As he has pointed out, in my house also we had installed it for heating water; but I am told that for some reason the previous Prime Minister did not approve of it. (*Interruptions*) Now it is not working. We are trying to set it up again. Solar energy is being used for heating and cooling photovoltaic irrigation solar drier, solar thermal power devices, biogas bio-mass production for conversion of alcohol, petro-products in collaboration with Australia, the USA, France and FRG.

SHRI BHUPESH GUPTA: Sir, before you ask the hon. Home Minister to reply to Question No. 225—a series of questions—do we have an assurance from you that our privilege of receiving replies to questions from him will not be interfered with by denial by an unnamed official the next day or the same day? As you know very well, he gave replies to certain questions in this House and immediately they were denied by an unnamed official. I have asked you to find out the name of that official who repudiated the Home Minister's statement. Therefore, Sir, I want a clear assurance from Mr. Zail Singh that whatever answer he is going to give here now will be protected against instant denial by some unidentified, unnamed official, and specially at the instance of the American Embassy.

SHRI JAGJIT SINGH ANAND: Outside the House he has made some other statement. It has come in the "*Tribune*". When he went to Chandigarh he called a Press Conference, but he would not come to the House to clarify or correct his statement. He has gone away from the statement he made in the House. This is an insult to the House. There must be some assurance that the dignity of the House will be kept up.

श्री शिव चन्द्र झा : सभापति महोदय, यह प्रश्न संख्या 225 किसके नाम से यह भी पूछेंगे क्या ? आपने प्रश्न-कर्त्ता का नाम पूछा क्या ? तरीका यह रहा है कि सवाल पूछने के पहले प्रश्न कर्त्ता का नाम बोला जाता है । परन्तु माननीय सदस्य पहले बोल उठे और उनका जवाब मंत्री जी देने लगे । जो तरीका है वह चलाइये यह मेरी पहली बात है ।

मैं 225 सवाल पूछूंगा । लेकिन उसके पहले मुझे थोड़ा सबमिशन करना है । उसकी आप इजाजत देते हैं या नहीं ?

श्री सभापति : पहले सवाल पूछियेगा, उसके बाद सप्लीमेंटरी में जो कुछ कहना है वह कहिये ।

Jail manual

*225. SHRI SHIVA CHANDRA JHA: Will the Minister of HOME AFFAIRS be pleased to state:

(a) whether Government are planning to change the jail manual;

(b) if so, what are the details in this regard; and

(c) if the answer to part (a) above be in the negative what are the reasons therefor?

THE MINISTER OF STATE IN THE MINISTRY OF HOME AFFAIRS (SHRI YOGENDRA MAKWANA): (a) to (c) A statement is laid on the Table of the House.

Statement

The subject "Prisons" is in the State List of the Seventh Schedule to the Constitution and as such, administration of prisons is the responsibility of the State Governments. However, the Government of India has been pro-