विज्ञानकर्मी

VIJNAN-KARMEE

JOURNAL OF THE ASSOCIATION OF SCIENTIFIC WORKERS OF INDIA

(Founder President—Pandit Jawaharlal Nehru)

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Narendra Singh

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Pandit Nehru on ASWI

"I consider it a privilege to be associated with the Indian Association of Scientific Workers. Such an Association was urgently needed in India and the Indian Science Congress has given shape to it at the right moment. It is meant to protect these workers and to help them. It is meant also for the advancement of science and the service of the community. I hope that scientific workers all over the country will join this Association and make it an active and vital organisation."

—*Jawaharlal Nehru*

विज्ञानकर्मी

VIJNAN-KARMEE

Vol. VII] January & February, 1955 [Nos. 1 & 2

Tasks Ahead

We welcome the announcement made by the Prime Minister that the definite objective of planning in this country should be the evolution of a socialistic pattern of society, gradually and peacefully. The endorsement of this policy by the recent Avadi session of the Congress augurs well for the future of the country in that it sets a definite and clear economic objective for the Central and State Governments. It is a matter of particular gratification to us that a socialistic pattern should have been accepted by the Government and the National Congress in view of the fact that we have, at successive annual sessions in the past, expressed the opinion of the scientific workers, that the future development of the country should be along socialistic lines involving a greater and greater degree of public ownership of means of production and equitable distribution.

The clear enunciation of the economic objective is significant in the context of the thought being bestowed on the Second Five-Year Plan. It is to be hoped that the principles, on which the Second Plan is to be based, will bring the ultimate goal of socialism nearer and nearer in course of time. A transformation of the economic pattern of society of this nature cannot be achieved without science and technology taking a more direct and active part in planning and fulfilment of plan targets than has been possible in the First Plan period. It has been the opinion of some competent foreign as well as Indian observers that the role of science in the First Plan is rather implicit and not explicit. It will not be an exaggeration to say that the fulfilment of a plan rests largely on the extent of direct participation of scientists and technologists.

The Second Plan is being widely discussed now. The lessons of the First Plan are being reviewed so as to plan better for the Second. This is a question which affects, apart from the large masses of our country, intimately the scientific and technical workers. We suggest that the various scientific bodies in India bring their mature experience and judgment to bear upon the problems connected with the formulation of the Second Plan. We simultaneously urge on the Government to entrust a greater share of responsibility in planning to the Indian scientific community.

We note with satisfaction the recent appointment by the Government of a panel of social scientists, largely economists, to advise on problems of planning with particular reference to the Second Five-Year Plan. We urge that it will be profitable if the panel is enlarged to include an equal proportion of representatives of natural sciences and technology. This would afford the latter an opportunity of direct association with planning in a greater measure than hitherto.

It may be recalled that the Prime Minister in his address to the Association of Scientific Workers of India in January last at Baroda emphasised the necessity for the creation of a scientific temper in the country which he called "Vaignanik Bhavana". The association of scientific and technical workers with problems of planning would go a long way to induce this temper in the country in the current national context.

The relation between scientific research on the one hand and the development of industry and agriculture on the other and the utilization of the end products of research to further production, industrial as well as agricultural, are matters which are vital for the formulation of a realistic plan for the next five year period. The research being carried on in the various national laboratories should be closely linked with the production problems of the contemporary period. In the light of these requirements, we have critically studied the Egerton Committee's report on the working of the national laboratories and, in a resolution adopted at the last annual session, recommended the appointment of a scientific commission composed of eminent Indian scientists so as to lay down the lines on which the much needed liaison and coordination in this field can be ensured. The appointment of this Commission and an analytical study of current scientific research in this country not only in the national laboratories but also in various universities and other industrial establishments assumes added significance in relation to the Second Plan.

The fulfilment of the national responsibilities of scientists is intimately connected with an adequate recognition of their professional, economic and social status. As the Prime Minister has repeatedly pointed out, the

The Late Dr. Shanti Swarup Bhatnagar

The late Dr. Shanti Swarup Bhatnagar, D. Sc., F.R.S., F.N.I., was born on the 21st February, 1894. After taking the M.Sc. degree from the Forman Christian College, Lahore, he went to England in 1919 and worked in collaboration with Prof. F.G. Donnan, who is well-known for his theory of "Membrane Equilibria". He obtained his D.Sc. through the University College London in 1921. On his return home he worked as Professor of Chemistry at Banaras Hindu University where he built up, in a very short time, a school of physical Chemistry. In 1924 Dr. Bhatnagar joined the Punjab University as Professor of Physical Chemistry and Director, University Chemical Laboratories. His 16 years of stay at Lahore were marked by intensive activity in the field of research, particularly in the spheres of coloid chemistry, surface magneto and photo chemistry.

In 1940, soon after the outbreak of the Second World War, the Government of India enlisted his services as Director of Scientific and Industrial Research. In spite of the heavy burden of routine administration, Dr. Bhatnagar was able to devote enough time to research to develop processes of great importance and significance to industry.

It was given to Dr. Bhatnagar to fulfil the historic mission of realising the Prime Minister's vision of putting India on the scientific map of the world, and the result can be seen today in the 12 National Laboratories which have sprung up in rapid succession between the years 1950 and 1954. These have laid the foundations of the country's scientific development in the field of fundamental research and applied. To translate the fruits of research into industrial terms he conceived the idea of a National Research Development Corporation which he was able to carry into early effect with the active assistance and support of the Prime Minister. His skill as a negotiator is evidenced by the agreements that have been concluded by the Government of India with three of the world's largest oil combines to establish up-to-date refineries in India. It was largely owing to him that a heavy media separation plant was installed in Madhya Pradesh by a leading mining concern for beneficiation of low grade manganese ore.

As Secretary of the Ministry of Education, which post he held on two occasions in addition to his other duties, he gave active support to proposals for the setting up of a School of Asian Languages in the Banaras Hindu University, raising the emoluments of University professors and teachers to attract men of the right calibre and increased financial assistance to universities through the University Grants Commission of which he was appointed the first Chairman.

Dr. Bhatnagar's was a rich and diverse personality compounded of learning, scientific curiosity, a keen aesthetic sense and personal charm which won him a large circle of friends. He had the gift of organisation and of a quick and sound judgement. He will long be remembered for his signal service to the cause of science in India.

growing unemployment of scientific workers in the midst of planning is an anomoly and incongruity which should engage the serious attention of the scientific workers themselves besides the Government. The collection of factual data about the working and living conditions of the scientific workers is still a task to be fulfilled by the Association itself. Even so we commend this problem to the Government for earnest consideration and re-emphasize the close relation which the economic condition of scientific workers has with the formulation and successful implementation of the Second Plan.

Atomic Energy Development in India

A report on a speech delivered by Dr. H.J. Bhabha at the Indian Science Conference, Baroda, January, 1955.

Dr. Bhabha was addressing a gathering of several hundred scientists at the Indian Science Congress Session in Baroda when he declared that the principle aim with which atomic energy work is being undertaken in India is using it as a source of industrial power. According to his figures the total coal and oil resources of the world could be estimatsd to last only a few centuries. In fact if all countries of the world became fully industrialized and power consumption per capita increased sharply, the coal and oil resources would be exhausted much sooner. The necessity of finding an alternative source of power was therefore obvious.

Dr. Bhabha said that before controlled 'fusion' as in the hydrogen bomb could be used, fission energy of the type released by an atomic bomb has to be utilized. For a process of fission, however, out of the 92 known elements and several hundred isotopes, there is only one substance, namely Uranium 238 and Thorium which can be considered 'fertile'.

After describing the British system for the production of atomic fuel, Dr. Bhabha outlined a system that would suit our resources, and would be based ultimately on the exploitation of Thorium—a fertile substance of which over a hundred thousand tons are estimated to be spread on the beaches of Travancore alone. Monazite containing even more than O. 35% of Uranium has been reported from places on our east coast. For use as moderator in a slow neutron pile, Dr. Bhabha discussed various substances and pointed out some of the difficulties associated with their use, manufacture, purification and handling. Heavy water was favoured by him because inspite of its prohibitive cost of import (Rs 10 lakhs per ton from Norway) it could be made available as a by-product of a fertilizer plant. Dr, Bhaba suggested that if a fertilizer plant in Bhakra-Nagal could fertiliser heavy water, this expensive material could cost almost nothing—since even with the added cost, the fertilizer would be cheaper than that from Sindri.

Dr. Bhabha discussed briefly some of the problems Indian scientists would have totackle and solve in connection with the development of atomic energy work in our couutry, especially because at every step one came across information which has been classified as confidential by other countries. The corrosion of metals used in the pile, and the general physical properties and behaviour of substances under exposure to heavy radiation is one of such problems which will have to be taken up by us. For this purpose an early installation of an experimental pile is a necessity. The problem of fiinding a suitable fluid for extracting heat from the pile, and of remote control and servomechanisms for handling highly radioactive materials was, according to Dr. Bhabha another of such important problems. For the Universities where a lot of very expensive and specialized equipment was generally not available Dr. Bhabha suggested the study of the effet of minute and measured impurities on the structure and behaviour of matter.

A the end of his talk, Dr. Bhabha assured the Indian scientists gathered there that such a development of atomic studies would be pursued in India evcn without foreign help; however, he said India was willing to enter into more extended co-operation with all other countries for the expansion of the knowledge of the atom and its industrial application.

Pandit Nehru Addresses A S W I

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What Pandit Nehru said and thought about the Indian Association of Scientific Workers seven or eight years ago, he said, is even more true now.

He said our first five year plan was started when we had no data and little idea of things. But now that more statistical data are available and materials may also be procured, what is of prime importance is the man - because he cannot be so easily trained or obtained and it takes years to build technical and scientific personnel. What India needed more than anything else - even money —today was trained personnel. The fact that in the face of such a national need, we still have unemployment among scientists, to which the President of the Association has drawn attention indicated that there was something wrong in our social structure. This fact spoke of the part disorganisation and bad management of our economy and social life are playing. Our society should be reorganised in such a way that anomalies like want of trained men on the one hand and unemployment of the trained on the other did not exist. Scientists are needed both to advise regarding what to do and for doing it. We can ignore this only at our peril.

Appealing to the scientific and technological workers to play their part in the many national reconstruction programmes before the country, Pandit Nehru said unless India brought up her progress - economic, social and other - on par with other nations, it would become impossible even to survive.

Pandit Nehru emphasized that he had not the least doubt in his mind that the country was well set on the road to progress and that India would forge ahead in spite of all obstacles. Now at least we have the atmosphere for planning in the country. Some years ago there were opinions for and against planning but now we take it for granted and accept it.

Science is also an attitude of mind, a method often antagonistic to our traditional ways of thinking. Even scientists when outside the bounds of their subjects live in a different world of ideas. There is the need of a "scientific temper" in the country and to create such a "scientific temper" work is needed - sicence has to be taken to the people. Such "scientific temper" alone would help the nation combat evils of reactionary movements which hampered progress. Pandit Nehru said that he had no doubt that such tasks being undertaken, the country will progress even faster. The scientific workers could play a very valuable part in creating among the people the right type of psychology and he called upon the scientific workers to propagate among the people what he called "scientific temper" (VAIGNANIK BHAVANA) He said that in this context he gave great importance to the Association and he had great expectations.

India, he said, could legitimately take pride in what the country had been able to achieve in the short space of only three years of the first Plan. This achievement had already had its effect on international opinion, but they should not become complacent but redouble their efforts.

Referring to the suggestion that there should be improvement in the lot of scientific workers, Pandit Nehru said while he agreed with this plea, he would ask them to realize that India was a very poor country and the first task was to work hard.

Presidential Address

by

Major General S. S. Sokhey

9th Annual Meeting Of A. S. W. I. Baroda, 4-1-1955

We are very glad and feel highly honoured to have you here with us today at the 9th Annual Meeting of the Association of Scientific Workers of India. We Welcome you, Sir, as the Founder President of the Association and as our beloved Prime Minister, a true friend and a great patron of science and scientists.

In 1947 when the Association was founded, you, in your inauguration address, said :

"Such an Association was urgently needed in India and the Indian Science Congress has given shape to it at the right moment. It is meant to protect these workers and to help them. It is meant also for the advancement of science and the service of the community. I hope the scientific workers all over the country will join the Association and make it an active and vital organisation."

Scientists And The Five-Year Plan Of Development

Our country and we scientists need this organisation today more than ever. We are in the midst of implementing our First Five-Year Plan of Development to mitigate the poverty and misery of our people, the heritage of over two hundred years of merciless colonial exploitation. The Second Five-Year Plan is in the offing to increase further the resources of our country to give our people a competence and a cultured life. This is a tremendous task, and depends for its implementation on the availability and the proper use of highly developed techniques in industry, agriculture and medicine. Science must play a leading part and the scientists an active role.

Indian Science Congress And The Association Are Complementary To Each Other

You, Sir, and your Government have clearly indicated the path the country must take to establish a classless and casteless society, and your Government have indicated its economic and industrial policy, and what is more, you have always asked for and welcomed constructive suggestions. You have rightly pointed out that in independent India all of us are the government, and that we should take due share in building up the country. In this regard the scientists, who have enjoyed very special privileges of scientific education, which is still beyond the reach of the nine-tenths of the people, owe a special duty to the country at this stage of development. We ought, besides our normal duties, to take interest in and find time for the study of national problems and put the result of our study at the disposal of the Government. Further we should take science to the people, illuminate their life and enable them to develop a scientific outlook. To do so we must work as an organised body by joining the Association of Scientific Workers of India which concerns itself largely with the social aspects of science. We must look at the social problems not from any party point of view, or from any interest of individuals, but from the point of view of the whole country, study the subjects as trained scientists and express views in a restrained and responsible language. To be able to do so the Association should speak in the name of the vast majority of the scientists of the county. Just as today the Indian Science Congress has brought into its fold a vast majority of Indian scientists, similarly should the Association of Scientific Workers of India The two are complementary bodies, as the Indian Science Congress devotes itself to science and technology while the Association of Scientific Workers deals largely with the social aspect of science. At this stage of our country's development this aspect of work is as important as the scientific and technical knowledge itself.

Importance Of Scientists Organising Themselves

The need for the scientists organising themselves into the Association of Scientific Workers is obvious. Only thus can they pool their resources to undertake the national tasks and speak with one voice and be respected. But the importance of this duty of scientists is not fully realised and appreciated. Our efforts to strengthen the Association are not viewed with favour by some departments of the Central and State Governments. In fact a large number of scientific workers feel that their Governments and the heads of their institutions do not like them to join the Association because it does not limit itself to the academic issues of science, but concerns itself with the social implications of science and the working and the living conditions of the scientific workers themselves. These apprehensions have turned out to be genuine in a number of instances. Some officials in authority and some senior scientists do not realise the social importance of science and scientists speaking as an organised body. We must, therefore, work ever harder to win over the active suppport of the people who are still in doubt about the service which the Association can render to the country. The fact that you were the Founder President and wanted the Association to grow should have prevented any such doubt from arising. However, your presence among us today will again bring to the notice of all the importance of this organisation to the country, and if need be, I am sure, you will declare that the Central and State authorities should help in every way possible for this organisation to discharge its very important duties.

Taking Science To The People

We scientists on our part are conscious of the fact that we should organise ourselves effectively to render that service to the country which only the scientists can render. First and fore-most we must take science to the people and create a scientific outlook among them. Scientific outlook is essential if we are to successfully mount over our numerous social and economic difficulties. For that purpose we should organise to give simple talks on general science illustrated with slides, charts, graphs, etc., and the talks should be to popularise scientific knowledge as such. Equally important we should study in the localities in which we live the day to day problems of our people and illuminate them by scientific talks. It is certainly valuable to give general popular lectures on science, but it is still more valuable to clarify the problems that are of moment to the people and form part of their daily life, by scientific explanations. And those of us who live in industrial areas should in addition give popular scientific talks to explain the science and technology of the industrial production they are engaged in, and the social implications of their productive effort. Thus we will be doing service of the greatest value to the country and thereby earn the respect and friendship of our communities, which will encourage us to do more.

Peaceful Introduction Of Socialist Economy

Another very important duty we can discharge is that we should study the various social and economic problems that face the country, study them in a fundamental and objective manner. At present the country is deeply involved in multiplying its productive resources through five year plans of development. We have a definite duty to discharge in this sphere. We should apply ourselves to study the question and put forward constructive proposals. The Government has very clearly enunciated that it wants to build the country on the basis of socialist planned economy because the capitalist system can not help us to develop the resources effectively and rapidly. In this regard we have a great deal to learn from the Soviet Union, the People's Republic of China and the People's Democracies of Eastern Europe who are building themselves on the basis of planned socialist economy. But we cannot apply their experience directly to India. We must translate their experience in terms of Indian conditions. This is a tremendous and important task and we can legitimately

take an important part in it. We should study this problem, what requires to be done and how, and suggest ways and means to bring about socialist economy under our social order. The other day you, Sir, stressed that the Russian and the Chinese systems rose out of historical upheavals. You rightly do not wish to wait on such upheavals to take place in our country before we harness socialist planned economy to solve our problems. We should, therefore, look at the problem from that point of view and study the developments that must be undertaken and the steps through which these can be brought about. You, Sir, very rightly desire the change to take place under our parliamentary form of government. This should be possible since you were not committed to any dogmatic form of that system, but are agreeable to introduce suitable changes, if circumstances demanded it. Here is a task worthy of all the effort and talent we can find to show the way to the development of planned economy in our country.

The Problem Of Unemployment

Then again there is the question of unemployment. When we look at it we immediately come to the conclusion that it is not a problem by itself, but is a offshoot of an unplanned economy and the under-developed state of the country. Further that it is widespread phenomenon which affects the whole community, and the unemployment or malemployment of scientific workers is only a serious part of it. The problem of unemployment must be faced squarely as affecting all workers and methods must be devised to deal with it as a whole. Of course there may be certain small emergent instances where the need can be met by *ad hoc* arrangements. For example, a large number of young science graduates, at present unemployed, can be given short courses of instruction in mineral surveying at all possible centres and pressed into service to survey the mineral resources of the country, which needs to be taken in hand urgently. But the wider question of unemployment can only be met by working out a plan of socialist expansive economy, and the steps needed to implement it. Under extensive industrial development a number of unemployed workers would be absorbed in industries. In addition cooperatives of craftsmen, carpenters, shoemakers, metal workers, etc. should be formed with State aid to put to work as many workers as possible. The reason why such individual workers can not carry on at present is that they lack funds and borrowing is fatal for them, and again because they cannot compete with the products of large scale industry. But under planned socialist economy it should be possible for the State to equalise prices so that the handmade articles are not discriminated against. I am offering this as an example how the socialist planned economy can take care of and give work to almost all workers in a reasonably short space of time.

Working Conditions Of Scientists

Another very important activity which the Association of Scientific Workers of India must attend to is to study and keep the Government informed of the conditions under which the Scientists work with a view to helping Government to see to it that the conditions are such that the scientists can give their best to the science and to the country. In order to bring about a situation such as we scientists desire should prevail for scientific work and the maximum utilization of scientific and technical knowledge in the country, we should study the problem and bring to the notice of the Government our findings with constructive suggestions. We must aim to create a situation in which the scientists are enabled to give their best. In the expanding economy of our country, security of tenure and financial competence should be achieved. However, while undertaking this vital broad study we should make every effort to mitigate any presonal hardships that arise to individual workers from the present unplanned economy.

This in brief, Sir, is our outlook and an outline of our programme. We propose to work out the necessary details to convert it into a blue-print of work. Should we

See page 11

Messages

Prof. Frederick Joliot Curie, President, WFSW

I am very happy to greet today on behalf of the World Federation of Scientific workers the meeting of your Annual Council.

Our Federation wishes you a rapid and great development and wants to avail itself of this opportunity in order to tell you how much it appreciates your contribution to its activity.

Your Association has well realised during the past years that the whole of mankind was working today with a mixed feeling of fear and hope. That was the meaning of your resolution regarding your appeal to the UNO for the convocation of an International Scientific Conference.

We have undertaken action about which you are already informed and we should pursue it until we obtain success, faithful to our charge and to the resolution of our General Assemblies.

We are certain that we can rely on your active cooperation.

I renew to you, therefore, the greetings of the Federation and I would like to add, if you allow me, a special message of sympathy for your President, my friend Maj. Gen. S. S. Sokhey.

Paris
13-12-54

F. Joliot-Curie.

Profesor J. D. Bernal, Vice-President World Federation of Scientific Workers

I wish the greatest success to the meeting of the Association of Scientific Workers of India. What I have seen of your activities during my short stay in your country has convinced me more than ever of the importance of the Association and the part it needs to play in the intellectual and economic life of India. Particularly now when there is a great need of the use of science and technology in the service of national reconstruction the corporate activity of your Association is essential. However well the government is advised on higher level, it is the working scientists who really know the possibilities and the difficulties of the application of science. Any effective plan involving development of heavy industry must give a large place to science and end the present intolerable state of unemployment and misemployment of scientists. I hope the Association may be able to cooperate with Governments and States in this task. In this way also the unsatisfactory material conditions of many Indian scientists may be improved.

Finally, by your success you will be able to increase the already great contribution of Indian scientists to the World Federation of Scientific Workers, especially in the cause of the peaceful utilisation of science.

J. D. Bernal.

Prof. J. G. Crowther, Secretary General, WFSW

On the occasion of your Annual Council in January, 1955, the World Federation of Scientific Workers sends the warmest greetings, and best wishes for your deliberations, and future development.

The growth and initiative of your Association is a factor of immense importance for the future of science, not only in your country, but in Asia and in the world. This has been illustrated by your proposal

Continue from page 10

need financial aid, as we are sure we shall, particularly in the project of popularisation of science, we shall approach the appropriate departmens of the Central Government. We trust we shall succeed in winning over hea cooperation of all the departments of the Central and State Governments in our endeavour to do this important national work. We are confident, Sir, we shall continue to be worthy of your active support.

of an International Conference of Scientists, which is being vigorously pursued by the World Federation.

We look forward to further valuable results of collaboration with the Association of Scientific Workers of India, and wish you all success in your most important work.

London
12-12-54 } J. G. Crowther

Shri Kanwar Sain I S E, Chairman, C W P C, New Delhi

I have great pleasure in sending my greetings to the Council and General Body of the Association of Scientific Workers of India on the occasion of its 9th Annual Meeting.

In modern life Science and Technology provide the key to good living and a steady rise in the standard of comfort, not only for the leisured classes, but for the common man. Through wise husbandry and careful utilisation of our vast resources in men and material, the scientist and engineer, I am sure,can work up a decent living for all our millions. In this effort each of us has a role to play. As individuals our services call for dedication to the cause of implementing the policies of Government aimed at increasing output and national income. As members of a group with a scientific outlook, an onerous responsibility rests on us to help the statesmen mould national policies in the sphere of constructive endeavour. It is on this front that the Association of Scientific Workers of India has much to contribute and distinguish itself as something more than a more trade union. Such a contribution, I am sure, will also establish in its wake the right of the scientist and engineer to be given a place in Government, second to none.

I wish the deliberations of the Association every success.

Kanwar Sain
28-12-1954

Dr. V. K. R. V. Rao, Director, Delhi School of Economics, Delhi

I am very glad that such an Association is in existence and I am deeply appreciative of the good work it has already done.

With all good wishes,

Dehli-9
29-12-54 } V. K. R. V. Rao

Shri C. D. Deshmukh, Finance Minister India

Some centuries ago the world relapsed into a dark age. One of the reasons why our country lagged behind while others recovered on to the state of advancement was that the sea of science which took elsewhere found ours an inhospitable soil perhaps because of the entrenched weed of superstition and dogma. Happily this has changed in recent years and the number and the proven confidence of our scientific workers today enables us to face the occasion of your annual meeting. I send my greetings to the Association of Scientific Workers of India and wish them an ever-widening sphere of endeavour.

New Dehli
December 24, 1954 } C. D. Deshmukh

Sir Shri Ram, New Dehli

I am glad to learn that your Association has completed 8 years of useful service to the scientific workers of India and your annual meeting will be addressed by the Prime Minister in the first week of January at Baroda. I wish your session every success.

New Delhi.
24-12-54 } Shri Ram.

S. Lal Singh, M. P.

I am glad that our Prime Minister has kindly consented to address the Association. I wish I could attend the meeting of the Council but regret my inablity to do so as I have got another engagement.

Undoubtedly the Association of Scientific Workers of India can render greatest possible service to the country in the formulation of a realistic plan for the Development of natural resources in this country. I wish the Conference a great success.

New Dehli.
31-12-54 } Lal Singh

I. Report of the General Secretary

The ASWI has completed its eighth year, a year of considerable importance in the life of the Association. In the very beginning, close after the annual elections, four office-bearers at the Central Office resigned for personal reasons and the Central Executive Committee appointed the following in the resulting vacancies.

Vice-President	Dr. K. S. Krishnan
General Secretary :	Shri Narendra Singh
Joint Secretary :	Shri G. S. Sirohi
Treasurer :	Shri C. S. Rao.

Vijnan-Karmee

Except for the issue of February 1954, Vijnan Karmee has been published regularly. The financial position of the journal has become more difficult because of the improvements made in its content and get-up. Since this situation could not be allowed to continue, the CEC issued an appeal for funds. The response to this appeal has not been very encouraging and the journal continues to be a drain on our finances.

As is evident from the issues of the Vijnan Karmee, the Branches have been more regular in sending reports of their activities. The number of articles written directly for the journal by our members and other Indian Scientists has increased.

During the 9th Annual meeting of the Council a commission was set up to thoroughly discuss the difficulties and suggest improvements in the journal. At Baroda members have voluntarily sold 245 copies in two days (The largest sale of 135 copies was made by the Bombay Branch) Amongst the individuals Miss Seeta Ganpathy deserves special commendation for selling 36 copies and they deserve our congratulations.

Editorial comments in the journal were made on the following subjects : Hopes for 1954; Indian Science Congress; Hydrogen Bomb and Scientific Workers; National Laboratories and industrial developments; India's atomic energy programme; Mineral development; Personnel for River Projects; The Flood Problem; Research Institutions and the Universities; Technical Training and Retrospect and Prospect.

Data on Living and Working Conditions of Scientific Workers

The questionnaire on living and working conditions which was issued by the World Federation of Scientific Workers was circulated to different branches and units. Bangalore, Hyderabad and Poona branches reported some progress and the Hyderabad Branch has sent a set of questionnaires directly to the Central Office duly filled in. The Calcutta Branch is collecting data on its own questionnaire, and so is our Sugar Technologists Section. The CEC adopted a note on the "Economic Survey of Scientific Workers" for initiating a discussion on this problem, and this has been circulated to the Branches and Units and it was also published in the June issue of Vijnan Karmee.

Action on Resolutions :

The resolutions passed at the last Annual General meeting were communicated to the various agencies concerned but replies received have indicated that in future our resoultions must be more specific and they should be based on more concrete information.

The results of our resolution requesting the World Federation to appeal to the UNO for a convention are of special interest.

The resolution was placed along with a statement of the ASWI on Hydrogen bomb explosions on the agenda of the 13th Executive Council meeting of WFSW.

The decisions of the Exective Council of the WFSW are as follows:—

1. Organisation of an international conference of scientists is the Federation's most urgent and important task.

2. Conference should be as broad as possible and be held in the spring of 1955.

3. Acad. Oparin and Dr. Piquard should put forward a continued proposal for the agenda.

4. The Bureau, with President's help be left to decide on how to start, whether or not by approaching the United Nations.

5. A special number of the Bulletin should be devoted to selected statements by scientists throughout the world.

6. The following convening Commitee was appointed to procceed with the project.

The President
Prof. C. F. Powell
Prof. L. Infeld
Acad. Oparin, or possibly a Soviet physicist.
Prof. Hirano or other Japanese respresentative
A representative of China
A representative of India
Maj. Gen. S.S. Sokhey is representing India on this Commitee.

The following letter has been received from the WFSW:—

"On the motion of Academician A. I. Oparin, at its 13th Meeting, the Executive Council of the Federation unanimously resolved that a message of warm congratulation should be sent to the Association of Scientific Workers of India, on their most important request that the Federation should help to initiate an international meeting of scientists to discuss the banning of weapons of mass extermination. Would you please convey the message to your Executive Council ?

The Federation's Executive Council discussed this proposal at length and will be writing to you again shortly, about the action it is taking in the light of the discussion."

We have further noted that now the World Federation is proposing specific steps to the UNO for making effective the Conference called by the UNO. The World Federation is also proposing to call a conference of scientists in Geneva, or a place near it, which is to immediately follow the UN sponsored conference. This will give a chance for a large number of scientists from all countries to gather on a non-official platform and to freely and frankly discuss this question of vital importance to the whole world.

We have received the following reply to our resolution suggesting the sending of Indian students to USSR and other countries.

"I am directed to refer to your letter No. Co/CEC/54 dated 21st July 1954 on the subject mentioned above and to say that the Government of India have noted the contents of the Resolutions adopted by your Association at its meeting held in Hyderabad in January 1954 on the training of students in foreign countries and the possibilities of of the use of weapons of mass destruction.

As regards the training of students in foreign countries the Government of India agree in principle to sending of Indian Students to all foreign countries without distinction, wherever facilities for further training are available. In this connection, I may add for your information that the Government have under consideration a proposal for the exchange of students with the people's Republic of China and of sending Indian students to Japan for further technical training."

Trade Union Cases :

The following trade union cases were taken up at the Centre and the Branches :

(i) In respect of the order of the Hyderabad Government asking Dr. S. H. Zaheer, Vice-President of ASWI to resign from Honorary Professorship of Osmania University.
(ii) Termination of services of Dr. M. S. Chaudhuri.
(iii) Termination of Services of Mr. K. D. Sharma
(iv) Representations for improvement of working conidtions of scientific workers at Kalka.
(v) Representations from affiliated organisations.

See page 21

2. Commissions' Reports

(a) Report of the Science Policy Commission.

Chairman : Dr. Rais Ahmed.

Recorder : Dr. Miss. B. M. Braganza.

It was felt by the Council delegates assembled here that the Association should try to integrate its understanding of the various problems connected with our country's declared aim of driving towards a socialist form of economy, and of drawing up the second five year plan. As the discussion on the whole economy of the country was out-side the scope of the meeting it was suggested that the ASWI should work out those aspects of the five year plan which concern the scientific workers. It was felt that a "science policy" of the Association would also greatly help in popularizing the Association and clarifying its stand in vital questions of national reconstruction.

In comparison to these "lofty" aims, the time allotted to us was exactly two hours ! And what is more, every one was not quite prepared for a considered and weighty discussion. However, while the discussion was general, it was very encouraging to note that there was also general agreement on the most important points.

Now these points of agreement with reference to different divisions of the topic will be briefly reported.

Industry :

1. There was general agreement that rapid industrialization and modernization of agriculture is our urgent need, and for this purpose a) there should be planning, and going forward to obtain help and advice from countries which have similar problems or have experience in planning; b, the basic and key industries should be given priority and made to development through Government investment. Private capital could neither keep national interest above profit nor had it the necessary vitality to undertake this immense and many - sided task. Even if private capital from other countries has to come, it should be channeled through our Government so that it may be utilised rationally. In this connection the immediate need of nationalizing our coal mining was stressed.

It was said that India was paying a huge sum in royalties on foreign investment here; and even now about 80% of our production of coal, jute, tea and many other materials was in British hands. The existing agrrangements with foreign firms are detrimental to our national interest, and they could be changed entirely if Government were to set up parallel and competitive industry with the help of any countries that could give us the capital goods and facilities to do so.

Trade :

(a) It was the general opinion of the Commission that we should cease to be a party to the patents agreement, and in fact, for rapid industrialization, the patent law should be abolished. The import and export trade policies should be directed towards safeguarding the industries which are essential for our economic independence. It was also suggested that if trade in private hands cannot carry out this national task, we should have an agency like the trading agency in China.

Technical Problems :

The question of our present technical dependence on Britain, and to an extent on America was specially pointed out. It was said that with political independence, and even with growing economic independence, if we do not free ourselves from the hold of other countries in technical matters our economic independence will always be an illusion. The necessity of using some prevalent foreign standards was pointed out but at the same time it was emphasized that as in engineering industry design formulae based on foreign products are used, there should be a determined effort to analyse them and have Indian equivalents. The

role of national laboratories in this connection was obvious and such problems would be a source of co-operation between industry, national laboratories and also the Universities.

In this context it was felt that our technical education should be remodelled, and after drawing up a list of nationally important problems our research efforts should be directed to their solution. There should be greater stress on applied rather than foundational research. The utilization of psychological methods and the principle of vocational guidance in planning the human side of our effort suggested.

In the discussion on the popularization of science it suggested that this may be done effectively by consideration of particular problems of interest to the community in a scientific manner and by explaining to the people both the scientific method and the social significance of science. The importance of starting popular science digests in regional languages was also stressed.

(b) Report Of The Commission On The Trade Union & Organisational Problems :

Chairman : Mr. M. R. Raman.

Recorder : Mr. A. K. Deb.

The commission discussed the organisational difficulties of the different branches, which mainly fall under the following heads :

1. Finances and Enrolment of members.
2. Programme of interest.
3. Publicity.
4. Co-ordination between the interests of members belonging to different organisasions, institutions and industries within one branch.
5. Parallel and competitive organisations doing more useful work than the ASWI.

In respect of these difficulties, the commission found that the opinion was to activise the work in the following manner.

(a) Programmes such as popular Scientific lectures, Exhibition of scientific films, scientific exhibition and demonstration etc., etc. should be drawn to attract members and non-members, followed by determined personal contacts, so that a vigorous enrolmet drive may be set up.

(b) Setting up of branch offices at Central places inviting people there and publicising and advertising the activities of the Association there.

(c) Co-operating and co-existing with organisations of similar objectives.

(d) Catering to the different social, scientific and if possible cultural needs of the members working in heterogeneous institutions.

(e) An executive committee in the branch may be formed with active members to avoid the passive inculcation of interest.

For the trade union aspect, the commission found that each branch has to face peculiar problems of its own, the solution in one branch not fitting in the other. It is also a controversial question for the Government employees, who are sometimes not allowed to join it. Branches with heterogeneous units or members are not recognised by Governments to work as trade unions. Further more, the trade union Bill to be introduced in the Parliament is feared to be very reactionary, which will seriously undermine, if not completely terminate, the smooth functioning of the Association.

However, the commission found an unanimous opinion in favour of the view that the Association should work as a Trade Union.

In view of these circumstances, it was proposed that a committee might be formed with Messrs. Raman (as convenor) C.S. Rao and Dr. R. Ahmed as members with power to co-opt, :

1. to draft a policy for the Association (after considering the various difficulties) which will enable it to work as trade Union either vertical or horizontal applicable for smooth working in any branch of this Association,

2. to get adequate, authoritative legal opinion on this matter for evolving a policy without any constitutional loophole under the trade union act, and

3. to circulate such a draft policy to

the different branches as early as possible to elicit their opinion, suggestion and modification if any,

4. to place the final draft before the Central Executive Committee within four months.

(c) Report of the Commission on 'Vijnan Karmee'

Chairman : Shri A. Rahman
Recorder : Dr. K. S. Korgaonkar

The discussion on Vijnan Karmee invited suggestions that would make the journal more attractive gaining larger circulation and be a useful platform for expressing the views of the scientific workers effectively and for giving an account of their activities and problems. Suggestions were also invited to find ways and means to increase the finances for Vijnan Karmee.

Mr. Rao, a delegate from Delhi Branch pointed out the necessity of having a set editorial policy for the Journal. This, he felt, could be based on the views expressed by our Commision on Scientific policy. He requested the branches to secure by way of advertisement, etc. some financial help to the V. K. Fund. The reports of the activities of the branches were stated to be inadequate and irregular.

Suggestion of Prof. Bannerji, a delegate from Calcutta, that the Journal could be changed from a monthly to a bi-monthly issue was not favoured by a number of delegates.

Dr. Rangachari from Bangalore was in favour of having the editorial board rotated from one unit to another, but this suggestion was found to be difficult from the organisational point of view, besides the doubtful advantages of such a step. It was, however, suggested that there may be regional committees to advise from time to time on the editorial policy conducted by the Central Board.

Mr. Baldev Singh from Hyderabad was very critical of the general get-up and contents of the Journal and desired a modification that would make it more attractive and of a standard similar to that of 'Scienec and Culture'. Dr. Korgaonkar from Bombay was also in favour of improving the get-up of the Journal and wished that greater attention was given to the scientific activities and only articles of high calibre be included in the Journal.

Regarding finances, Dr. Roy from Calcutta suggested that Government Education Departments may be approached for suitable donations. Various branches of the Association of Scientific Workers of India promised to collect donations for the V. K. Fund and accepted certain *targets** to be reached by the end of February, 1955. Promises were also received from different branches to secure some advertisements from local business concerns. It was suggested that some advertising Agencies may also be approached for securing such advertisements on a commission basis.

**Promised donation targets :*

Calcutta	...	Rs. 500
Lucknow	...	,, 200
Bangalore	...	,, 50
Poona	...	,, 100
Bombay	...	,, 100
Kanpur	...	,, 50
Aligarh	...	,, 100
Delhi	...	,, 25
Raniganj	...	All support

3. Amendments to the Constitution

The following amendment to Rule No. 18 of the Constitution was unanimously adopted.

Rule 18 :—The enrolment fee and subscription shall be determined by the Council from time to time subject to ratification by the General Body of members in the Annual General Meeting.

Note (i) The enrolment fee for ordinary and Associate members is fixed for the present at Re. 1/- (instead of Rs. 5/- and Rs. 3/- respectively). The annual subscriptions for ordinary and Associate members are also fixed at Rs. 5/- and Rs. 3/- respectively.

(ii) In case of persons who are eligible for Ordinary membership but whose basic salary does not exceed Rs. 100/- per month, the annual subscription shall be Rs. 3/- each.

4. Arrangements for the activities of the Association during 1955.

1. Composition of CEC and its office bearers :—

President	...	Gen. S. S Sokhey
Vice-Presidents	...	Dr. K. S. Krishnan
		Dr. S. Husain Zaheer
General Secretary	...	Mr. Narendra Singh
Joint Secretary	...	Dr. M. R. S. Iyenger
Treasurer	...	Dr.S.P.Raychoudhuri

Members :

Dr. J. J. Chinoy	(Delhi
Dr. S. Dhawan	(Bangalore)
Dr. N. P. Gupta	(Lucknow)
Dr. B. C. Guha	(Calcutta)
Dr. S. L. Hora	(Calcutta)
Mr. V. R. Joshi	(Poona)
Dr. N. D. Kehar	(Izatnagar)
Dr. K. S. Korgaonkar	(Bombay)
Mr. M. R. Raman	(Kanpur)
Mr. Baldev Singh	(Hyderabad)
Dr. B. Viswa Nath	(Delhi)
Mr. H. N. Mukherjee	(Calcutta)

The Secretaries of the following branches will be ex-officio members of the CEC :—

(1) Aligarh (2) Bangalore (3) Bombay
(4) Calcutta (5) Dehradun (5) Delhi
(7) Hyderabad (8) Lucknow (9) Poona

2. Composition of Editorial Advisory Board :—

President.

Dr. Rais Ahmad	(Aligarh)
Dr. P. K. Kichlu	(Delhi)
Dr. R. Prasad	(Delhi)
Mr. A. Rahman	(Hyderabad)
Dr. N. R. Srinivasan	(Bangalore)

General Secretary will act as ex-officio Editor of 'Vijnan Karmee'

3. Dr. J. J. Chinoy (Delhi) be nominated as the ASWI representative on the Indian National Commission for Co-operation with UNESCO.

4. CEC thanked Messrs. T. R. Chadha and Co., Chartered Accounts, Delhi for their honorary services during the past year and requested them to continue as Honorary Auditors for 1955 as well.

6. Dr. P. K. Kichlu be requested to continue as Publisher for Vijnan Karmee.

7. The budget estimates for the year 1955.

Receipts.		Rs. As. Ps.
1. Opening balance	...	85/- 0/- 0/-
2. Expected contributions from members.	...	4000/- 0/- 0/-
3. Advertisement charges in Vijnan-Karmee	...	4000/- 0/- 0/-
Total.	...	8085/- 0/- 0/-

Expenditure

	Rs. As. P.
1. Salaries, allowances & expenses of officers.	500/- 0/- 0/-
2. Salaries, allowances & expenses of establishment	600/- 0/- 0/-
3. Cost of Publishing Vijnan-Karmee.	6200/- 0/- 0/-
4. Stationery & Postage	700/- 0/- 0/-
5. Balance in hand	85/- 0/- 0/-
Total ...	8085/- 0/- 0/-

Appendix

List of institutions where the ASWI is functioning :—

Aligarh	Aligarh University
Bangalore	Indian Institute of Science.
Baroda	Sanitax Chemical Industries.
Bombay	(1) The Haffkine Institute, (2) The Tata Memorial Hospital (3) The G. S. Medical College.
Calcutta	(1) University College of Science and Technology (2) Central Glass and Ceramic Research Institute (3) College of Engineering and Technology (4) Indian Association for the Cultivation of Science (5) Presidency College (6) National Instruments

	Factory (7) School of Tropical Medicine.
Dehra Dun	(1) Technical Development Establishment (2) Forest Research Institute.
Delhi	(1) Indian Agricultural Research Institute (2) Central College of Agriculture (3) Ministry of Commerce and Industry (4) Ministry of Food and Agriculture (5) Malaria Institute of India (6) Meteorological Department (7) Council of Scientific and Industrial Research (Publications) (8) Delhi Cloth and General Mills (9) University.
Hyderabad	(1)Central Laboratories for Scientific and Industrial Research (2) Women's College (3) Saifabad Science College.
Izat Nagar	Indian Veterinary Research Institute.
Jaipur	Maharaja's College
Kaghaz Nagar	Sirpur Paper Mills, Kaghaznagar (Hyderabad State)
Kalka	Camp Laboratories.
Kanpur	Indian Institute of Sugar Technology
Lucknow	(1) Central Drug Research Institute (2) Lucknow University (3) King George's Medical College.
Naihati	(1) Jenson and Nicholson (India) Ltd, 24-Parganas (2) India Paper Pulp Co. Ltd., Naihati.
Patna	Bihar College of Engineering
Poona	India Meteorological Deptt (2) National Chemical Laboratory of India (3) Public Health Department
Rani Ganj	Bengal Paper Mills Ltd
Sabour (Bihar)	Office of Entomologist to the Government of Bihar, Sabour (Bhagalpur District.)
Kanpur	Scientific Workers Association, (India) Ordnance Services) 101 Hardinge Road, P. O. Box 173, Kanpur.
Khamaria	Khamaria, Jabalpur c/o F. I. Section, Ordnance Factory, Khamaria.
Kirkee	Association of Scientific Workers (Ordnance Establishments) Joglekar Quarters, Poona-4

Continued from page 16

(vi) Representations from NIF unit of ASWI.

A novel feature of the ASWI activity this year has been the convening of Council meetings two days before the start of the Science Congress. The delegates have had an opportunity of exchanging views in detail on serveral questions of great importance for the Association. There was useful discussion on economic, trade and technical problems facing the country as a whole, and the scientists in particular. Vijnan Karmee was also discussed in detail from the point of view of improving its appearance and sale, of increasing the number of advertisements; and enriching its content. The problems of trade union nature facing the Association were discussed in the light both of the reported experience of the Branches, and the forthcoming trade union law. These reports in summary form are appended and it is hoped that on their basis our work will be speeded up in the year 1955.

The Financial Position :

The financial position of the ASWI remains difficult as before. The following branches have not remitted the share due to the Centre :

Raniganj, Dehradun, Bombay, Naihati, Poona. Calcutta.

RESOLUTIONS

(Adopted at the 9th Annual Council and General body meetings at Baroda in January, 1955)

RESOLUTION No. 1

Condolence Resolution on the Death of Dr. S. S. Bhatnagar

It was just on the eve of this Annual Session of the Association that the Members learnt with deep regret of the sudden death of Dr. S. S. Bhatnagar. In the council on the 2nd and in the General Body meeting on the 4th Jannuary 1955 the following resolution was adopted by the Members and they paid their homage to the memory of Dr. Bhatnagar who was an illustrious member of the Association by standing and observing two minutes silence. The resolution reads as under:

The Members of the Association of Scientific Workers of India express their deep sorrow on the untimely death of Dr. S. S. Bhatnagar in whose sudden passing away, the country has indeed suffered an irreparable loss.

This meeting of the Association pays its homage to the memory of the eminent scientist and an illustrious member of the Association and conveys its heartfelt condolence to the bereaved family.

RESOLUTION No. 2

Facilities For Training Abroad

It has long been a desire of the Members that the Association should undertake upon itself the task of exploring the possibilities for training and study of the Indian Scientific Workers on long-term and short-term basis in foreign countries. The basic understanding in the background of this move was that in the present state of the national development, the Association should take upon itself, in co-operation with Sister Organisations affiliated to the World Federation and others outside the WFSW, to evolve and implement a definite plan of arranging to send Indian Scientific Workers abroad so that after obtaining the correct type of training their academic background and experience they fit in to the present structure of the developmental work in the country and carry out the tasks of national development. A rough draft of the scheme of sending Indian Scientific Workers abroad was also presented by the Aligarh Branch which was accepted by the Council and the General Body as a basis for conducting and and negotiating with sister Organisations and various other responsible bodies in the foreign countries. The resolution adopted on the subject reads as follows.

In the interests of scientific development, The Association should immediately investigate the possibility of obtaining facilities for training and study of scientific workers in other countries on short term and long term basis.

RESOLUTION No. 3

Atomic explosions and call to Afro-Asian Nations and Scientists

The Association has been, practically since its inception, condemning atomic and other weapons of mass destruction. It was at the last annual session at Hyderabad that a resolution was adopted wherein the World Federation was requested to approach the United Nations to organise an international Convention of Scientists for suggesting effective measures for ensuring a ban on all weapons of mass destruction. Only a little later, the Govt. of United States of America started experimental explosions of Hydrogen Bomb in the Pacific. It was natural that along with other people, the Scientific Workers also felt greatly concerned at these new developments. The Central Executive Committee of the Association issued a statement, wholeheartedly supporting Pandit Nehru's call for a standstill agreement and requesting the United Nations and W. F. S. W. to organise an International Convention of scientists. The World Federa

tion decided to convene a Conference and, in the meantime, the United Nations also decided to convene a Conference under the UN auspices. The World Federation approached the United Nations to expand agenda and enlarge the scope of discussion at the conference to which the United Nations has not agreed. Therefore, the World Federation has decided to convene a broader International Conference.

The first atomic bombs were dropped on the towns of an Asian country and also the experimental explosions of the Hydrogen Bomb have been carried out in Asia. Again, Japan has suffered tremendously on account of these explosions and other Asian countries also have collected evidence of the contamination of the atmosphere. The conference while discussing this aspect, felt that an opportunity is afforded by the proposed Afro-Asian Conference wherein all these neighbouring countries could come to an agreement and jointly protest against these experiments; demand a ban on the atomic weapons and such a joint move on the part of the Afro-Asian nations will have strong influence on the experiments and also on the future course of development of research in atomic energy.

The Association was also aware that an Asian Solidarity Conference was being organised in New Delhi to discuss the common problems in the Asian countries and to properly coordinate the organisational moves in respect of maintenance of peace.

The basis of the Asian Solidarity Conference is going to be the five principles which our Prime Minister and Premier Chou-en Lai of China have agreed upon. It was unanimously felt that this opportunity should also be availed so as to collect the Asian Scientists on a common platform to discuss this important problem of atomic energy developments and it was decided that an approach should be made to the Organisers of the Asian Solidarity Conference to include scientists as well in the delegations which shall be coming from different Asian countries so that a meeting of the Asian Scientists could be organised on this problem.

The following resolution was accordingly adopted. :

In the opinion of the Association of Scientific Workers of India, a very serious situation has arisen in connection with atomic energy developments because :

(*a*) *the major powers have not been able to arrive at a settlement for prohibition of atomic weapons.*

(*b*) *the NATO Commanders have actually been asked to prepare for the defensive use of atomic weapons.*

(*c*) *according to considerable scientific opnion the effects of experimental hydrogen bomb explosions have even been un-predictable."*

Experimental explosions of H. Bomb even though they may not immediately destroy life, have very serious accumulative adverse effects on life as predicted by physicist Charles Noel Martin, in a paper presented recently to the French Academy of sciences, and by Nobel Laureate Prince Louis de Broglie.

According to Charles Martin, Neutrons from an H-Bomb turn the atmospheric elements into large amounts of radio-active carbon 14, whose half life is 5,500 years. Absorbed by plants. it eventually enters the tissues of animals and humans. Results are unpredictable but would fall in line with raising appreciably the general level of the earth's radio-activity. Even a slight increase is likely to have important genetic effects. Experimental reasons for fearing this increased radio-activity are well established. C. Martin also points out that such explosions form vast amounts of nitric acid out of atmospheric oxygen, nitrogen and moisture. This may be enough to acidfy rain over large areas with adverse effects on vegetation- Another possible effect is that H-Bomb when exploded on the ground, throws into the air something like one billion tons of pulverised materials. Floating for years in upper atmosphere, the dust may oust the strenght of sunlight, act as condensation nuclie, stimulating rainfall and thereby changing the pattern of winds. Such modifications of climate will not necessarily be good.

Therefore, this Association desires that every effort should be made to secure standstill agreement on such experimental explosions and fully supports the stand of Shri Jawaharlal Nehru on this issue.

The Association appeals to the sponsors of the forthcoming Afro-Asian Conference to place this question on the agenda of the Conference so that the Afro-Asian countries may jointly protest against the use of their territory for experimental explosions and may collectively appeal for a ban on all types of atomic weapons.

The Association further requests the sponsors of the Asian Solidarity Conference which is to held in Delhi, to include scientists among the delegations to be invited from the various countries so that the question of banning of atomic weapons and promotion of peaceful development of atomic energy may be discussed among Asian Scientists."

RESOLUTION No. 4

Retrenchment In Lucknow Medical College

As has been reported in the October issue of Vijnan-Karmee, two lecturers in K. G. Medical College, Lucknow were retrenched in the beginning of the last academic session. In the first instance, the Lucknow Branch took up the matter locally and a deputation waited on the Vice-Chancellor and other authorities but there was no success in those efforts. The members felt very concerned primarily on the manner in which this retrenchment was carried out without giving any consideration to the seniority and other merits of the individuals. The case has been fully reported in Vijnan-Karmee and in the absence of any suitable response from the authorities, the following resolution was adopted.

"*This meeting of the Association of scientific Workers of India expresses concern at the manner in which the services of two lecturers of the K. G. Medical College were terminated. The Association urges upon authorities of Lucknow University to take immediate steps for the re-instatement of the retrenched lecturers. If this is not possible, the University should provide alternative suitable employment for the retrenched lecturers so that their qualifications and experience are properly utilised by the country*".

RESOLUTION No. 5

National Instruments Factory :

The National Instruments Factory at Calcutta is a very important factory and is one of the few which are directly in the public sector. Naturally it is expected that when our Government has proclaimed socialist economy in the country as the objective, the Scientific Workers in the establishments under the Government should be given full encouragement in developing the establishment in the national interests and should be taken into confidence in respect of the plans of development because whatever may be the plans of development, it is the common scientific worker which has to implement and carry it out to the end. The Scientific Workers in the National Instruments Factory have made representations to their authorities to re-organise and develop the factory. They have been putting forward the plea that the Scientific Workers in the factory should be consulted in implementing the Five Year Plan schemes to develop the factory as they have long experience of work there. The members at the annual session strongly felt that the demand of Scientific Workers in the National Instruments Factory was very justified in the national interests.

The following resolution was adopted.

"*The Association notes with regret the inordinate delay in the implementation and development of the National Instruments Factory, Calcutta which is a factory of very great national importance in regard to both industries and defence. It urges on the Government to implement the scheme with the greatest possible expedition and also to consult the Scientific Workers of the National Instruments Factory who have very long experience in this line in regard to the further development of the factory.*

The Association of Scientific Workers of India, after having carefully studied the report of the Egerton Committee regarding the development of scientific research in India is of the opinion that, while the above report has drawn attention to certain important problems confronting scientific research in the country, it has not gone deeply into some aspects which deserve and urgently need a thorough investigation.

The Association of Scientific Workers of India, therefore, recommends to the Government of India the appointment of Science Commission composed of representatives of scientific research, education and industry in the country, to make an exhaustive survey and report on the progress of scientific research and education in the country, paying particular attention to the following :—

(*i*) *Research programmes in the National Research Institutes and their relation to the development of the country.*

(*ii*) *Liasion with Industry and utilisation of results of completed research projects.*

(*iii*) *Provision of equipment, apparatus and chemicals for the National Research Institutes through national resources and effort.*

(*iv*) *Close collaboration between the Research Institutes and Universities.*

(*v*) *Organisation of science education in Universities and Schools to be of maximum use for national development.*

(*vi*) *Social and economic conditions of scientific workers in Research Institutions, education and industry."* *See page 25*

RESOLUTION No. 7

Collaboration Batween Osmania University and Central Laboratories :

In the August issue of Vijnan-Karmee a report on the order of the Hyderabad Government asking Dr. Hussain Zaheer, Director, Central Laboratories, Hyderabad (Dn) and one of the Vice-Presidents of the Association, not to continue as Honorary Professor of Chemical Technology, Osmania University, was brought to the notice of the General Members. The developments at the branch level also have been reported therein, but no fruitful results have been achieved on the representation made by the Branch in this matter. The Members at the annual session strongly felt that there was great need of callaboration between Universities, Research Laboratories and education, research and industrial development in the country in the national interests. In this particular case, many scientific workers in the Central Laboratories were also affected by this order of the Hyderabad Government. In the light of these facts, the following resolution was adopted.

"The Association of Scientific Workers of India deplores the action of the Government of Hyderabad in refusing permission to Dr. S. Hussain Zaheer, Director, Central Laboratories, Hyderabad (Deccan) to continue as Honorary Professor of Chemical Technology, Osmania University, thereby debarring a scientist in Government employment from fully contributing to the educational and technical development of the State; interfering with the happy collaboration that existed between the two Institutions which was a unique feature of scientic education and research in the State; causing hardship to the students and staff of the two Instiutions and adversely affecting the development of science and technology in the State.

The Association of Scientific Workers of India urges on the Government of Hyderabad, therefore, to review their order and restore the *status quo* in the interests of fruitful scientific development in the State."

RESOLUTION No. 8

It has been a long felt need that there must be science museums in the country to bring science close to the people. In many important towns there are no museums at all and in some where there are musuems ther is no section for science or if there is it is very poorly equipped; as such, through the following resolution, the Association wishes to draw the attention of the appropriate authorities to institute a science

section in the already existing museums and also to open new science museums where they do not exisit.

"The Association of Scientific Workers of India urges on the Government of India to take steps in co-operation with State Governments to establish science museums in important cities and/or to open science sections in the already existing museums in the country, as a means to popularise science and develop a scientific attitude among the people of the country."

RESOLUTION No. 9

Ban On Weapons Of Mass Destruction

Reiterating its earlier stand for demanding a ban on the atomic weapons of mass destruction, the following resolution was adopted.

"The Association of Scientific Workers of India reiterates its earlier resolution calling for a a total ban on the manufacture, test and use in war of all nuclear, bacteriological, chemical and other weapons of mass destruction; and in this connection expresses its appreciation of the efforts of the Government of India in endeavouring to bring about agreement among the World Powers for enforcing such a ban."

RESOLUTION Nos. 10, 11, 12 and 13

On behalf of the Scientific Workers employed in the Technical Development Establishments, Ordnance Factories and in the Army Headquarters, the Association has adopted the following resolutions in respect of :

(i) Working Conditions in he TDEs
(ii) Security of Tenure
(iii) Working hours in TDEs
and
(iv) Medical facilities.

It may also be mentioned that the three organisations working at Kanpur, Kirkee and Khamaria which are affiliated to the Association of Scientific Workers of India have made representations at various levels to their authorities in respect of these demands but the Government has not given a satisfactoy consideration to the requests. The Members of the Association unanimously support the demands and urge upon the Government to do the needful in the interests of proper scientific development in these establishments and in the interests of the Scientiffc Workers.

RESOLUTION No. 10

Working Conditions In T. D. Es.

"The Army Units of the Ordnance Services all over India are governed in respect of their working conditions among other things by the age old regulations for the Army Ordnance Services.

The importance of scientific and technical research, design and development pertaining to the equipment needed by the services was realised during World War II and there now exist a chain of Technical Development Establishments all over India under the control of the Director of Technical Development, Master General of the Ordnance Branch, Army Headquarters.

Since these newly sprung up research, design and development establishment and institutions are a part of the Army Ordnance Branch, the Regulations for the Army Ordnance Services have been applied to these establishments as a whole without taking into consideration that the regulations may not as such, be suitable for units engaged in scientific and technical research

The strict conformity with the RAOS requres the scientific workers to spend a good bit of their working hours in fulfilling unnecessary formalities (such as security duties, opening and closing duties etc) which are not conducive for creating proper atmosphere for research and develpment work and constitute a wastage of scientific and technical man power.

Therefore, this meeting of the Association of Scientific Workers of India urges that the TD Es engaged in research, design and development work for Army be removed from the purview of the out-moded regulations which govern Ordnance establishments in general and that a Commission be appointed by the Government of India

(a) to study the present working conditions in the TD Es
and
(b) to recommend a new set of rules at par with similar organisations such as National Laboratories, Government Research Institutions and the Defence Science Organisation."

RESOLUTION No. 11

Security of Tenure

In the year 1951, the Government of India decided to confirm 80% of its temporary employees in all Departments.

The Ministry of Defence, however, decided in May 1952 that only 40% of the temporary civilian employees in the Technical Development Establishments under the control of Army Headquarters will be confirmed for the present, and

that action was also in hand to convert more appointments into permanent ones to bring the percentage to eighty percent of temporary posts. However, the Ministry of Defence subsequently failed to raise the percentage of employment to be confirmed to 80% on the plea that the strength of the present Army is roughly double the strength of the post-war Army.

This meeting of the Association of Scientific Workers of India views the above decision and the consequent inordinate delay in the confirmation of 80% of the temporary scientific and technical personnel engaged by the Army Head quarters, with grave concern in view of

- *(a) expanding nature of the Technical Development work*
- *(b) emphasis on the 'Indigenous' production of all equipment for the Armed Forces*
- *(c) talk of correlation between the numerical strength of the Army and the number of units for research, design and development of equipment for the Army*

and this Association, therefore, urges that the Government's decision taken in early 1952 to confirm 80% of the temporary employees under the Government of India be immediately implemented in respect of employees under the Director of Technical Development, Army Head- quarters."

RESOLUTION No. 12
Working Hours In TDEs

"This Association draws the attention of the Government of India to the recommendations of the Central Pay Commission for maximum of 35 hours of work per week according to which the hours of work of all civilian Government employees at New Delhi and elsewhere were regulated in 1950. In the light of these recommendations, this Association wishes to impress upon the Government of India the unsuitability of the present working hours in the TDEs which are not conducive to the scientific nature of the work performed and which has no parallel in other similar research, design and development establishments in the country."

RESOLUTION No. 13
Medical Facilities

The question of the extension of *in* Civil Medical Attendance Rules to the civilians in Ministry of Defence installations at places other than Delhi has been under consideration of the Government of India since 1949.

It is understood that a census has also been taken in all establishments requiring civilian workers to opt for above extension of rules if they so desire.

The Association of Scientific Workers of India very much regrets the inordinate delay in the application of Civil Medical Rules to the civilian employees under the Ministry of Defence, in stations where the majority of the Civilian employees have opted for the same.

The Association of Scientific Workers of India also urges that the Government of India, as an ideal employer, should extend the above facilities to the employees immediately and thus remove discriminatory treatment amongst civilian Government employees."

RESOLUTION No. 14
Patents For Technical Processes In India

The Members felt that it is very necessary for the proper industrial development of the country that the present Indian Patents Law should be repealed, and therefore the following resolution was adopted.

It is an emergent necessity for our country to industrialise itself to give our people competence and cultured lif . But we have arrived late at the stage of industrialisation and the path is blocked by basic essential industrial processes being covered by patents owned by foreign firms. Of the 57, 678, patents on the Indian Register in 1949, only 7, 284 were owned by our Nationals and these patents refer to cottage industries. This lays our country open to financial blackmail or at the very least, very heavy royalities which it can ill-afford. They only way we can, under these conditions, develop our industries is to abrogate these patents. There is no international obligation for India to have patents, India has not yet joined and should not join the international convention on patents. It is to be noted that U. S. A. and Japan did not institute patent laws for about 50 years after they started industrialising themselves. Even after we abrogate the Indian Patent Law, we need not confiscate industrial proccess; we can give suitable payments to owners of such patents as we use and remove only the element of resentment and at the same time prevent ourselves being held up for ransom.

Therefore, this Association urges that the Government of India should repeal the Indian Patent Law."

(*Contd. from page No. 23*)

RESOLUTION No. 6
Commission for Scientific Research and Education

The attention of the Members may be drawn to the review of the Egerton Committee report which appeard in the August issue of Vijnan-Karmee. A very careful study of this report brought to light its limitations and as a conclusion of the study, the following resolution was adopted demanding a Commission for Scientific research and Education, to carry out a survey and report on the lines which have been suggested in the body of the following resolution.

The Association of Scientific Workers of India, after having carefully studied the report of the Egerton Committee regarding the development of scientific research in India is of the opinion that, while the above report has drawn attention to certain important problems confronting scientific research in the country, it has not gone deeply into some aspects which deserve and urgently need a thorough investigation.

The Association of Scientific Workers of India, therefore, recommends to the Government of India the appointment of a Science Commission composed of representatives of scientific research, education and industry in the country, to make an exhaustive survey and report on the progress of scientific research and education in the country, paying particular attention to the following :—

(*i*) *Research programmes in the National Research Institutes and their relation to the development of the country.*

(*ii*) *Liasion with Industry and utilisation of results of completed research projects.*

(*iii*) *Provision of equipment, apparatus and chemicals for the National Research Institutes through national resources and effort.*

(*iv*) *Close collaboration between the Research Institutes and Universities.*

(*v*) *Organisation of science education in Universities and Schools to be of maximum use for national development.*

(*vi*) *Social and economic conditions of scientific workers in Research Institutions, education and industry.*"

Branch Secretaries

Dr. Rais Ahmad, Shahin Villa, Dhodpur, Aligarh.

Dr. A. Bhati, Indian Institute of Science, Bangalore-3.

Mr. P. J. Tikekar, c/o Dr. R. G. Chitre G. S. Medical College, Parel, Bombay-12.

Dr. S. K. Mukherjee, Science College, 99, Upper Circular Road, Calcutta-9.

Mr. S. K. Roy, Optical Section, Ordnance Factory, Dehradun (U. P).

Dr. R. Prasad, Mycology Division, Indian Agricultural Research Institute, Pusa, New Delhi-12.

Mr. Baldev Singh Central Laboratories, P. O. Jamai Osmania, Hyderabad-Dn.

Dr. C. R. K. Murti, Central Drug Research Institute, Chattar Manzil Palace, Lucknow (U.P).

Mr. P. K. Kalathu, 16, JoglekarQuarters, Poona-4.

Unit Secretaries

Mr. H. H. Soni, Chemist, Sanitax Chemical Industries Ltd., Opp. Partap Talkies, Baroda.

Dr. K. Sahai, Indian Veterinary Research Institute, Izatnagar.

Prof. G. V. Bakore, Lecturer, Maharaja's College, Jaipur (Rajasthan)

Mr. Safdar Hassan, 13-B, S. P. M. Colony, Sirpur, Kaghaznagar (C. Rly).

Mr. H. C. Bhattacharya, Indian Institute of Sugar Technology, Kanpur.

Affiliated Bodies

Mr. M. R. Raman, General Secretary, Scientific Workers Association, (Indian Ordnance Services), P. O. Box 173, 101, Hardinge Road, Kanpur.

Mr. M. C. Puri, Secretary, Association of Scientific Workers, Ordnance Establishments, Khamaria, Jabalpore c/o F. I. Section, Ordnance Factory, Khamaria.

Mr. H. S. N. Murthi, Secretary, Association of Scientific Workers, Ordnance Establishments, Joglekar Quarters, Poona-4

Reports from Branches

Aligarh

Annual Report for 1953-54

This is a report concerning the third year of the activities of the Association of Scientific Workers, Aligarh Branch, and it is the second annual report being presented before the members.

First of all it is a pleasure to record that the last annual report of our Branch found a place in the Bulletin of the World Federation of Scientific Workers. The editors of the Bulletin seem to have felt that our approach to the problems facing an active Branch of the Association has been generally correct. As the only organization of scientific workers in this country with the aim of popularizing science and combating pseudo-science and superstition, of making scientific workers conscious of their responsibility and role in our society, and of safe-guarding the professional and trade interests of members and non-members alike, we have correctly visualized our tasks. But there is a considerable gap between our vision and the work we have actually done.

This Branch of the Association arranged several popular lectures on scientific subjects, and many teachers in the University very generously gave us time and help in this task. The choice of subjects for these popular lectures was limited by our availability of speakers, and we have neither quite succeeded in making the lectures as popular as we would like them to be, nor have we succeeded in creating interest in the most significant problems and discussions in the various branches of science.

For the benefit of teachers in the University, the Branch arranged a series of discussions on important questions that face us in the profession. We were fortunate in having Dr. Mujib, who is an experienced colleague ane has a deep knowledge of these problems, to lead our discussions on Methods of Teaching, on Examinations, and on Student-Teacher Relations. These seminars were attended by more than twenty teachers on an average, and they were followed by a keen exchange of views. We feel that this program has been quite successful, and we are thinking of arranging similar discussions on problems of research.

At the last annual meeting we had created a subcommittee to look into the problems concerning the research workers in the University. These problems, it was pointed out, were serious in respect of rights and privileges of research workers. The subcommittee met once and decided to have a questionnaire drawn up for gathering information regarding the problem under review. We are sorry to report that the questionnaire is not yet ready for circulation, although we hope it will be ready in the near future.

In connection with the popularization of science and discussing our own professional tasks, we have planned a science week. We have chalked out a program of scientific films, popular lectures, a symposium on Improving Education in the University, and a science exhibition. This program will be printed in advance and will soon be made public, but we have pleasure in announcing that a very large number of teachers and students are now working on various aspects of the program, and we have every hope that it will be a success.

As a prelude to the Science Week we had a membership drive and dues clearance drive in the first week of November. The returns of this drive are still coming in but we hope that we shall gain more than twenty new members and what is more, we shall have a sound financial position.

Now for a brief statement of what is the present financial position. Our total collections for the first year were Rs. 207/12/- and the expenditure was Rs. 210/13/- We spent a large amount namely Rs. 115/-

on tea parties which were necessary in the first year of our existence. The symposium on Scientific Research was another heavy item on which we spent nearly Rs. 70/- As a consquence of this expenditure we were unable to remit Centre's share of our collections. This year, to date. we have collected Rs. 211/-/- out of which we paid a printer's bill of Rs. 45/-/- and remitted Rs. 135/- to the Centre. We have therefore a cash balance of Rs- 22/3/- only. With this balance we have to enter our science week, and so the situation again does seem to be slightly gloomy. However, we are sure, more of our members will come forth with their dues and we shall be able to carry our science week programme successfully.

Rais Ahmed, Secretary
Aligarh Branch

Expanded Activities

The Aligarh Branch reviewed its activities of the past year and arrived at the conclusion that simply having popular scientific lectures, even if they bring out the relation between science and social problems, is not enough for the Association. If the Association is to expand, it must serve the needs of its members and must be able to enlist their enthusiastic participation in organized activity.

As a result of this conclusion, the Association this year planned a number of seminars on the professional problems of University teachers. These seminars were attended by twenty to about thirty teachers and the discussions led to certain consonance in views regarding student-teacher relations, examinations and methods of teaching. Then the Branch observed a dues-collection and new-member week, in which individually and collectively the achievements and potentialities of the Association were discussed. The week was quite successful because the Branch gained about twentyfive new members, and it collected enough money to pay a part of centre's outstanding share and to plan a Science Week at the beginning of December.

The programme of the Science Week began on the first of December with a film show on physical sciences in the largest hall available in the University. In all there were three film shows at different centres in the University. During the week, besides a popular lecture on Radioactivity in Biology and Medicine, a Science Exhibition was also arranged. In four days the exhibition was seen by nearly 1600 students and teachers; and it was an exhibition which emphasized not the "curiosity" angle of science, but systematic ideas on such important topics as evolution of the earth, and the organic evolution of the human society. There were sections in the exhibition on physics, psychology, biology, health and disease, and nutrition. Apart from popularization of scientific ideas obtained through the medium of the exhibition, the Branch gained in strength because its members in very large numbers worked collectively and voluntarily towards a common and concrete aim. Of course, the success of the exhibition has given the Branch a fairly important place in the institution.

The last item on the programme of the Science Week was a symposium on improving the standards of education in the University. The symposium was attended by about 60 per cent of University teachers of all subjectss, and it was opened by a paper read by the Vice-Chancellor, Dr. Zakir Hussain. In his paper Dr. Zakir pleaded for a more integrated and comprehensive planning of science syllabii so that the teaching and learning of science may come to have a closer relation with problems that are actually met with in life. There was paper by Dr. A. Mujib on Examination and Evaluation in which a plea was made for more objective examinations and for a weighty system of sessional marks. A third paper by Dr. Rais Ahmed pertained to improving facilities in the University by having a text-book renting library and provision at cost price of cyclostyled or

printed class notes, summaries and bibliographies. The papers were followed by lively discussion in which the Dean of Faculty of Science Dr. Mirza, and the Vice-Chancellor also took part. It is hoped that on the basis of this discussion it will become possible to effect some desirable changes in the University.

The Association has also given consideration to its prime task of improving the conditions of service of its members. This year, at the General Body meeting a number of resolutions relating to confidential reports, annual increments, provident fund, and privileges of temporary teachers were passed. Since we have an Association of University Teaching Staff also, our Branch passed the above resolutions and instead of taking them up directly with the University it requested the Staff Association as a more represntative body of teachers to put these demands before the University. It is hoped that proceeding in this manner, it will be possible to safeguard the interests of all teachers, and to create greater unity amongst them.

The Aligarh Branch of the Association may therefore be said to have turned a new leaf in its short life. It seems now possible that our Association will really be able to serve the interests of science as well as of scientific workers in its area.

Executive Committee members, 1954-55

President :	Dr. M. A. Basir Khan
Vice-Presidents :	Dr. Reayat Khan
	Dr. S. M. Shah
Secretary :	Dr. Rais Ahmed
Treasurer :	Dr. Intisar Husain
Joint-Secretary :	Mr. Bahauddin
Members :	Dr. Sami Hameed
	Mr. K. C. Asthana
	Mr. Matinuzzaman
	Mr. S. A. Majid
	Miss Shakti R. Pal
	Mr. Moin Farooqi
	Mr. Obaidul Haq
	Mr. A. Aziz
	Mr. Jamil Qadri

Bangalore

Prof. Pirie's Talk

At an informal meeting arranged on the 9th December 1954, at 9-30 a.m., Professor N.W. Pirie of the Rothamstead Experimental Station discussed matters of interest to scientific workers. The following is a summary of the questions asked by the members and the replies of Prof. Pirie.

Q. Many of our youngmen leave science at certain stages in their career and go over to administrative jobs, because the latter are more lucrative. Does a similar situation occur in Great Britain, and can the A.Sc.W. play any part in preventing the drain on scientific talent taking place in the above manner ?

A. In my opinion many people confuse between educabilily and scientific talent. The former does not necessarily include the latter. So far as scientific talent is concerned, it is only rarely that in Great Britain people possessing it ever leave science. It depends perhaps on the conditions of work prevelent for the scientific workers, and I do not know the conditions existing in this ountry.

Q. Are jobs for scientific workers offered after an advertisement or without ?

A. Almost all the jobs are advertised for as will be clear by looking into the last few pages of Nature or any other scientific journal. In the case of jobs higher up in the scale, however, it is generally decided beforehand to whom the job is going to be offered. Such a selection is invariably the best, and brings satisfaction to all concerned. Advertisement in such cases is only expected to take account of any possible oversight of the really talented candidate.

Q. Does the A-Sc-W- play any part in determining or guiding the expenditure of the Govt. or the industries on scientific projects ?

A. In Great Britain, the A-Sc-W- does not have any direct influence in these matters. It had attempted to suggest certain research lines to academic and industrial laboratories, but this programme has not worked out well in a satisfactory manner. The A-Sc-W- has been very successful, on the other hand, in mobilising scientific opinion on long range policies of the Govt. & Industries, and in indicating the projects that might possibly be worked out and those that could not be. It may perhaps be said with justification that the A-Sc-W- in Great Britain has created such an atmosphere in which its views are respected and taken into account. It is in close contact with many members of the Parliament, some of whom are also members of the Association. It has no voice in the policy making of bodies like the Royal Society.

Q, What are the general activities of the A-Sc-W- in Great Britain ?

A. (Professor Pirie traced the Association in Great Britain from the pre- First War period to the present day and indicated how the functions of the Association had been oriented to the changing pattern of the circumstances prevailing in Great Britain.) He said at the present time there is some disagreement regarding the functions of the A-Sc-W- However, the activities are mainly confined to the trade union activities, namely, the improvement of the conditions of work, the betterment of wages, etc. Due to an effi cient secretary , the Assocn. has been successful in winning a large number of cases for the scientific workers in recent times. The A-Sc. W. is recognised by the Govt. Personally I feel that the A-Sc-W- cannot thrive for long on mere trade union activities. It will weaken if it does not get the support of pure scientists, and for this purpose it must find other activities which will attract them to the organisation.

Q. What steps has the Association taken towards bringing about a ban of atomic weapons and atomic warfare ?

A- The A.Sc.W. does sympathise with these views, but is not directly connected with these problems. There are other organisations in Great Britan, e. g., "Science for Peace", which are actively engaged in this direction.

Q. What has the Association done towards the popularisation of science ?

A. The A.Sc.W has not done much. There are many writers of popular scientific articles who happen to be members of A.Sc.W., but I think they are engaged in the popularisation of science for their own satisfaction and not because they are the members of the Association.

The Professor illustrated his points by many examples. The talk lasted for an hour and a half. Dr. Bhati proposed a hearty vote of thanks to Professor Pirie on behalf of the Bangalore Branch of the ASWI.

Chemists and Chemical Engineers as an Industrial Working Team

Prof. Austin's Talk

Research is a primary function of a Chemist. From the needs of the industry an idea of the production of a new compound occurs to the Chemist. The production of the compound in the test tube and further laboratory elaboration in a bench-scale equipment to find out the optimum conditions of the process, is done by the Chemist. He produces sufficient product on a batch basis to allow thorough technical evaluation. If the study seems promising, it is handed over to the Chemical Engineer for the next stage which is the pilot plant stage. The plant is made big enough to assess the major difficulties which are liable to occur in the actual plant. At this stage, the Chemical Engineer studies

the heat transfer problems, separation, corrosion, agitation etc. and the Chemist checks his theories and confirms the modifying effect of industrial materials on the chemical reactions and yields. If at this stage the process seems economical enough for the commercial manufacture, then the main plant is designed bv the Chemical Engineer.

Pilot Plant

The function of the pilot plant is not over as soon as the actual plant is built. The pilot plant can be used in two ways afterwards. Firstly, research on the improvement of the process can be continued by the Chemical Engineers and Chemists. Secondly, the plant being large enough to produce about 10 per cent of the actual production, it can be run to produce a product of a slightly different quality to suit the demand of a minority of the customers, who want that quality.

Plant Operation

The operation of the plant is carried out by the Chemical Engineer, whereas the Chemist keeps a control on the quality of the products and the intermediates by laboratory tests. In recent years in the U. S. A., some Chemical Engineers have been used for technical service to the customers. They advise the customer in the choice of the right grade of the product, show him how best to use it and help him in solving the problems in his plant. The customer is assured of a regular supply of the product of guaranteed quality and promised quick delivery.

Team Spirit

Besides giving a general picture of the team work of Chemists and Chemical Engineers, Professor Austin gave an example from his own experience with the manufacture of zinc stearate and showed clearly how co-operation between a Chemist and a Chemical Engineer can bring about successful running of a chemical enterprise.*

Report on activities, (April to Nov. 1954)

The Branch continued work on all the incomplete projects of the last year.

Thus, the A.M.I.E. Classes intended to help the Branch members to improve their qualifications are going on satisfactorily. About 12 members would appear for the examination in May, 1955.

The work on the 'Survey of the living conditions of University teachers in the Bangalore area' is nearly complete. The results of this survey are expected to be published very soon.

The Branch members have also filled in the questionnaire of the World Federation of Scientific Workers.

The discussion on 'How to do more and better research' was concluded. A report on this along with a resolution urging the centre to ask other Branches and Units of the A.S.W.I. to take up this problem, has been submitted to the Centre.

The Branch also examined the question of the 'Popularisation of Science'. A note on this subject has been prepared and sent to the Centre for discussion in the Council meeting at Baroda.

The Branch Newsletter was irregular for a few months, but now it is being published regularly. Each Branch member is provided with a cyclostyled copy of it. The Branch Newsletter and the Friday meeting have helped in increasing contact between Branch members. Prof. Richard P McKeon addressed the members on 'Science and Philosophy'. Dr.N. W. Pirie of Cambridge met the members at an informal meeting in which Association matters were discussed.

**Summary of a talk delivered by Professor George T. Austin, Visiting Professor at the Indian Institute of Science, at a meeting of the Chemical Engineering Association of the Indian Institute of Science.*

Calcutta

Dr. B. C. Guha on USSR

At a largely attended meeting arranged on 11-11-54 under the auspices of the Association Dr. B. C. Guha spoke about his recent visit to the Soviet Union. Dr. S. K. Roy, one of the Vice-Presidents of the Association took the chair.

The Association was fortunate in having Dr. N. W. Pirie, F. R. S. as a distinguished visitor at the meeting. At the request of the Chairman of the meeting, Dr. Pirie very generously agreed to speak on the working and functions of the A.Sc.W. of Great Britain. He said that the Association had a laudable record of membership and acted strictly on TU lines. It achieved a large amount of success in its attempt to fight against armament, to provide adequate medical aid to scientific wo kers engaged in atomic research, and to equalise pay of scientific workers. The membership did not always include scientifically qualified workers; infact, such a broad aspect in the organisation should be encouraged.

While answering questions Dr. Pirie affirmed that there was hardly any conflict between the Government and the members of the Association who were in the Government employment. The main reason was that the Goverment servants were already members of a more efficient organisation, the Professional Workers Unions, whose membership was almost automatic. Research workers in schemes financed by the Government were however entitled to become AScW members and they did join in numbers.

Dr. B. C. Guha said that he visited the Soviet Union at the invitation of the Moscow University as one of the members of the delegation of Teachers and Students of Indian Universities. The visit lasted about a month and was necessarily a hurried one. The tremendous development in various fields in the U. S. S. R. demanded a much longer time than they could possibly devote. Dr. Guha emphasised three broad aspects of the cultural and social life of the Soviet people relating to (1) Education (2) Maintenance of Peace in the World and (3) Nation building works.

The entire nation appeared te be seething with an extraordinary enthusiasm for intellectual pursuits. The professors and scientists were most highly paid individuals in the country getting something like 8 to 10 thousand roubles whereas the directors of the biggest motor works received not more than 5000 rubles. Moreover, a scientist could get the type of remuneration, for example, as member of any accredited organisation he might get another 5000 rubles and as head of the laboratory another 5000 rubles or so. The lowest paid (unskilled) got something like 400 rubles which were sufficient for good living. The house rent is nominal in Government built houses. The lowest paid skilled workers get something like 600 to 800 rubles. The Universities reeeived handsome amounts from the Government by way of salary, research grants, equipment, books etc. Girls outnumbered boys in educational institutions, particularly in the medical colleges.

Dr. Guha went on to say that the University catered for the fundamental subjects but not for technological ones for which separate institutions existed. After school leaving, a student would go to a 5-year course in technology when a diploma (equivalent to our M.A. and M.Sc.) was awarded. Education was compulsory up to the 10th year, of which the first seven years' training was financed by the State.

An idea of the tremendous strides against illiteracy might be gained from the state of affairs of Uzbekistan, where literacy before

revolution was less than 1% where it was 100% at the present moment.

A remarkable sight was the seriousness with which the students, particularly the children availed of the excellent opportunities of the libraries. The reading rooms were almost always crowded, and often one had to line up for entrance.

New enterprises and expansions were accommodated in spacious buildings. For example, the Moscow University was housed in a large 32 storey building in which comfortable residential accommodation was provided for teachers and students numbering several thousands.

Dr. Guha deprecated the idea often entertained that the visitors to the Soviet Union were allowed to have only a guided tour. This was far from true in their case. The places visited were always arranged by mutual consultation, and every kind of option was given to the visitors. What struck the members of the delegation most was a genuine desire for peace in words as well as in deeds. In fact, an organised movement was there to preach the gospel of peace. The school children sang slogans of peace, the road-side statues were symbols of peace. No country, Dr. Guha said, who would go in for war would talk and preach so eloquently of peace. Any thing published or exhibited to rouse the spirit of hostility was punishable by law. The Indian delegates, whenever they spoke of peace, were greeted with loud emotional applause.

In their hurried tour, as already explained, the delegates could not see much of the subjects of their own interest. However, Dr. Guha visited a number of biochemical and botanical laboratories. He described some interesting types of work; for example, the one dealing with the production of artificial fish in the dam areas. In Uzbekistan, the genetics department had evolved a yellow variety of cotton. In the same place the spraying of superhphosphates on leaves was claimed to give better yields. Dr. Guha mentioned about a plough which needed to be used only once in five years.

Speaking about the treatment they were accorded in the Soviet Union, Dr. Guha said that they received the most generous reception wherever they went and often the reception was mingled with genuine affection. The Soviet Government would welcome exchange of teachers, and since the contact with that great country was highly desirable, our Government and people should take advantage of the opportunity.

Replying to a large number of enquiries at the end of his lecture, Dr. Guha said that every state had its own language, besides Russian, the national language which everyone must know. In addition, a third language, either French, German or English was compulsory

The conflict of cultural interests of different States was nonexistant. This conflict, according to Dr. Guha, could only originate from economic interests. As these were absent, the different culturcs form a cultural mosaic where each had its own place and scope of development and growth.

Religion was neither supported by the State nor antagonised. Churches were run by voluntary subscriptions of the believers.

Differences in levels of pay existed but there was no heirarchy. Private investment was not allowed. It was permissible to have a house in the town and another in the country, none of which could be rented or sold without Government permission. Income tax was nominal and there was no death duty. The land allotted to a collective farmer was his own which he could not utilise for investment but he could sell the produce. None else was entitled to own lands.

Regarding the educational set up, Dr. Guha affirmed that it was almost the same as ours but the examinations were mostly oral and practical. There were no written examinations. Physical training and Economics were compulsory.

At the end of Dr. Guha's talk, Dr. S. K. Roy, the Chairman of the meeting, sum-

marised in a neat speech, the main observations of the speakers and offered them, on behalf of the Association as well as of the audience, a hearty vote of thanks for their very informative and illuminating talks.

Convention

The Calcutta Branch of the Association held a successful convention on unemployment, mal-employment and under employment of scientific and technical personnel in India. The Convention was organised by a Preparatory Committee set up by the Calcutta Branch and included the representatives of the various scientific, technical and industrial departments and institutions in Calcutta.

In an outspoken message to the two day convention held on 18th and 19th December, 1954, Dr. J.C. Gosh, Vice-Chancellor,Calcutta University, drew attention to the lack of coordination in the Government's economic and industrial policies. The full text of his message is given below.

The convention was presided over by Maj-Gen Sokhey, F. N. I, M. P. who rightly said that vague general resolutions addressed to the Government serve little purpose. He analysed the social obligations of the scientists and called for constructive suggestions to be put forward to the Government. He also under-lined the need for a socialistic economy as an answer to the problem of unemployment.

The convention which had a number of resolutions for consideration had a general discussion on them and decided that they should be considered in detail by another session of the convention to be held later. A Committee was also set up to discuss the resolutions in the intervening period.

Message from Dr. J. C. Ghosh to the convention on Unemployment

Senate House,
Calcutta.

I am sorry that I am unable to attend the Convention on Scientific and Technical Employment. In a planned economy where the private sector is lagging behind the public sector in resource development, the responsibility for technological unemployment rests primarily with the State.

Men of science have common sense, though they may not know much of high finance or statistical background of mobilisation of resources. They generally believe that it pays to hold fast to the principle- waste not in luxuries, want not in essentials.

The Finance Minister on the 13th December, 1954 was keen on stepping up investment substantially and industrialising rapidly. He was very much concerned with the unemployment problem, specially in this industrial region of Calcutta, and thought that the only solution to this problem was more rapid capital formation and judicious choice of our investments. He, therefore, demanded larger sacrifices in the present and harder work all round. He hoped to achieve an investment of the order of 10 to 12 percent of the national income through larger public as well as private saving.

The very same day, the Deputy Food Minister in the Lok Sabha stated that it was intended to import 8 lakhs tons of sugar at a cost of 66 crores of rupees. One is amazed that a Government which belive in planning could squander their foreign exchange resources in this reckless fashion. The present difficulties of a neighbouring State should have brought home to our Government the effects of such squander mania. Self-sufficiency in food, is yet a gamble in good monsoons; and we are not sure that we may not have to import again food on a large scale. Decontrol of food ration is welcome, but sugar is not essential food. If this purchasing power of crores of rupees spent on foreign sugar could have been mopped up for investment, we might have three more fertiliser factories like Sindri, or a Steel Plant of half a million ton capacity or a coal processing industry which could

give one hundred thousand tons of synthetic aviation petrol, 250,000 tons of synthetic motor fuel, and also a million ton of soft domestic coke, which would have made the smoke nuisance of Indian cities a memory of the past.

One does not know what to think of a Government where the Finance Minister talks in one way and the Food Minister acts in another way. The internal tension in such a Government must be enormous; and the public feel bewildered. It appears that men of science have to educate their masters out of the view that satisfying the desire for more sugar is a greater act of merit than giving them facilities for making more fertiliser or steel; that a fertilizer or steel works not only creates new avenues for employment of technical men and skilled workers, but also lays the foundations of permanent prosperity in an underdeveloped country.

I hope that this Convention on Scientific and Technical Employment will have that educative influence.

J. C. Ghosh

Report of activities July to December 1954.

(Charge assumed by the Committee on 27-7-54)

The Calcutta Branch of the A. S. W. I. started its eighth year of existence under the Presidentship of Dr. S. L. Hora and with a total membership of 191. Eight new members have been enrolled this year raising the membership to 199. The percentage increase in membership is, however, smaller than last years. The following are the office bearers and members of the Executive Committee.

President	Dr. S. L. Hora.
Vice-Presidents	(1) Dr. S. K. Roy (Bose Institute)
	(2) Dr. A. B. Roy Chowdhury (S. T. M.)
Secretary	Dr. S. K. Mukherjee (Science College)
Jt. Secretary	Dr. G. Bhattacharjee (Science College)
Treasurer	Dr. D. Lahiri (Science College)

Members :

(1) Sri H. O. Mukherjee (N. I. F.)
(2) Sri S. K. Sen (do)
(3) Sri S. C. Chakravarty(do)
(4) Sri Hiren Basu (Science College)
(5) Dr. B. K. Banerjee (I. A. C. S.)
(6) Sri Sailen Bhattacharjee (I. A. C. S.)
(7) Sri H. P. Chatterjee (Presidency College)
(8) Sri M. K. Nag (Indian Museum)
(9) Dr. J. B. Chatterjee (S. T. M.)

The Branch has on many occasions felt the want of a Central Office where the members may assemble not in connection with business meetings alone. A small office room has been made available to the branch through the efforts of Prof. B. C. Guha in the Department of Applied Chemistry.

Financial Position :

The total receipt from subscription and admission fee is Rs. 166-11-0, which together with the amounts brought forward (Rs. 18-7-6) and that deposited with the bank (Rs. 163-0-0) comes to a total of Rs. 348-3-6. The expenditure including the following items amounts to Rs. 130-2-0 keeping a balance of Rs. 218-1-6.

Expenditure :

Paid to the Convention on Unemployment etc.	Rs. 25- 0-0
Typist	Rs. 25- 0-0
Printing letter heads etc.	Rs. 24- 0-0
Payment to Units	Rs. 18-12-0
Duplicating expenses	Rs. 5- 0-0
Meeting expenses	Rs. 16-12-0
Miscellaneous	Rs. 15-10-0
	Rs. 130- 2-0

Trade union cases

The only Trade union cases this year arose from a conflict between the Unit of the A. S. W. I. and the Workers Union of the N. I. F. This case has been entirely dealt with by the N. I. F. Unit, whose Secretary Mr. H. N. Mukherjee is in contact with the General Secretary of A. S. W. I. and the Government.

Popularisation of Science

The branch sponsored two meetings where eminent scientists addressed the members of the Association as well as a large number of visitors. The first was arranged on 28-9-54 when Dr. J. N. Mukherjee, Dr. P. K. Ghosh and Dr. S. L. Hora spoke about their impressions of the second Congress of the Pan Indian Ocean Science Association held in August 1954 at Perth, Australia. The next talk was arranged on 11-11-54 when Dr. B. C. Guha spoke about his recent visit to U. S. S. R. and Dr. N. W. Pirie of the Association of Scientific Workers of Great Britain on the activities and achievements of the Association of Scientific Workers of Great Britain.

Convention on Unemployment Malemployment and Unaerempolyment of scientific and technical personnel.

The branch sponsored the above convention which was held on the 18th and 19th December 1954 under the Chairmanship of Maj. Gen. S. S. Sokhey, M. P., the General President of our Association. A preparatory committee, with Dr. D. Lahiri, our Treasurer as Convenor, was formed at a meeting of representatives of various organisations in and around Calcutta, who were invited by the Calcutta Branch. This committee was entrusted to make arrangements for the convention and draft resolutions to be discussed at the Convention. As many as 400 delegates from almost all spheres of scientific and technical personnel attended the convention and participated in its deliberations. A draft note regarding the resolutions was discussed.

Units

The Jadavpur Unit is remaining defunct due to the resignation of its Joint Secretaries. Yet Jadavpur has now grown to be an important place in so far as scientific activities are concerned. Dr. B. K. Banerjee and Mr. S. N. Bhattacharjee of I. A. C. S. have initiated some talks in connection with the revitalising of the Jadavpur Unit. The next meeting of the Association is proposed to be held at Jadavpur.

S. K. Mukherjee

Delhi

The visit of Prof. J. D. Bernal, F. R. S. to Delhi was taken advantage of by the Delhi Branch when an informal meeting was arranged with the visiting Professor by interested active workers. A number of problems facing the ASWI were discussed with Prof. Bernal who, in the light of his own experience in Great Britain and his recent visit to China, offered valuable suggestions.

Replying to a question about the desirability of having a federal or unitary structure of the ASWI, he said, the answer is largely dependent on the specific situation in each country. Although the Association in a number of countries has unitary character, he pointed out that, it has a federal character in Australia. This arrangement, he said, worked quite satisfactorily. He emphasised the importance of having the Unit as the living basis for the functioning of the Association.

Addressing a public meeting later, he dwelt upon the role of science in planning in India. Science entered in Indian planning, he said, not explicitly but only implicititly. He said that it is very important for scientific planning that science should be inter-woven with various developmental schemes in a more straightforward fashion. Planning for the country should be done in conjunction with planning for scientific, advance. In fact, planning he said can not be divorced from science. In

fact, by planning is generally meant a scientific system of organising developmental activity.

Committee meetings

A meeting of the Executive Committee of the branch was held on the 19th October, 54 and General Body on 22nd Oct. 1954.

The Branch elected delegates to the council and decided to frame resolutions for consideration of the council meeting on

1. Relationship between Universities and Research Institutions

2. Science Museums in State capitals and

3. Reiteration of the ASWI stand on banning of nuclear and bacteriological weapons for mass destruction.

The Committee also reviewed the results of the deputation on the Vice-Chancellor and the Education minister regarding the relationship between research institutions and Universities. The Committee decided to collect information regarding other Universities and National Laboratories before taking furthur action in the matter. It also decided to arrange a group discussion on the subject to formulate the views of the ASWI clearly and precisely on the subject-

Changes in B .E. C.

The Branch elected Mr. R. Vaidyeswaran as the Secretary for the rest of the year 1954 in place of Dr.K.B.Deshpande who has gone abroad.

Report on activities in 1954

There has been a lull in the activities of the Branch during this year. Apart from a meeting in March to condemn tests on hydrogen bombs, there has been no meeting or function of the Branch till August 1954. The Branch had to deal with the situation arising out of the resignation of Dr. S.Husain Zaheer, Director, Central Laboratories from the Hony. Professorship of Osmania University on Government orders and the consequent hardships to which the Ph. D. students of Osmania University and staff of Central Laboratories who have registered for Ph. D. of Osmania University have been put. In this connection, a deputation waited on the Education Minister Hyderabad Government and the Vice-Chancellor,Osmania University. A memorandum was submitted to the Chief Minister, Government of Hyderabad and an interview has also been sought with him. The Branch has taken up the general relationship between Research Institutions and Universities in the country and a group discussion was held on this subject on 10th November 1954.

Dr. S. L. Hora was in the Chair

In the evening he paid a visit to Central Office of ASWI and had discussions with the office-bearers.

Hyderabad

Meetings: The General Body of the Branch met twice once to elect office-bearers and again for election of delegates and adopting resolutions to be sent to Centre. The BEC met six times in the year. Consequent on Mr. K. B. Deshpande going abroad R. Vaidyeswaran, Joint. Secretary, was elected Secretary of the Branch.

Subscription : The paid membership has fallen considerably and there is a reluctance amongst the members to pay the subscription.

Bulletin : Two issues of the Bulletin were published this year.

Activities of the Units : Of the four units under the branch only C. L. S. I R. Unit has been active during this year also. It had arranged a discussion on 'Research Institutions and Universities' and regular monthly discussions on Vijnan Karmee to improve its standard. Besides, it took part in the Exhibition organised by the Laboratories on the Foundation Day of the Laboratories.

A lack of interest in the Association has been noticed during this year also. The attendance in the meetings has been poor.

Even the BEC meetings were not attended by all the members.

Kanpur

Meeting.

The Kanpur Unit held a joint meeting of the Executive Committee of the Unit and the Sugar Technologists' Section Sub-Committee on the 22nd October 1954 in the Ceremonial Hall of the Indian Institute of Sugar Technology, Kanpur with Prof. J. P. Sukhla, Vice President of the Unit in the chair. The subject for discussion was how best the Sugar Technologists of the country can secure satisfactory conditions of employment with their employers through the proposed Sugar Technologists Section of A. S. W. I. More than fifty technologists attended on invitation. After the Secretary of the Unit had pointed out the various advantages that would be gained by the sugar technicians by uniting themselves under the Sugar Technologists' Section of the A. S. W. I., Prof. K. S. G. Doss very effectively stressed the immediate need of making collective and constructive effort to render the profession of sugar technology really useful to the indusry and the country, and this, he explained, can only be achieved through the platform provided by the A. S. W. I. in the form of Sugar Technologists' Section. Prof. N.C. Varma then addressed the gathering and brought out the unique advantages of being united under a trade union like the A. S. W. I. and its Sugar Technologsts' Section. Among the technologists the meeting was addressed by Sri N. Desai and Sri S. D. Singh. Both of them pointed out, uptil now there exists no organisation looking after the interests of scientific and technological workers in the Indian sugar and allied industries and the conditions of this profession are anything but miserable. Then Prof. Doss requested the technologists to make both the enrolment drive for the S. T. S. of the A. S. W. I. and the conductance of the Questionnaire issued by the Sugar Techologists' Section Sub-committee a success. Thereafter, enrolment forms, the questionnaire forms, together with the appeals were distributed to the technologists. The response apears to be encouraging so far.

New Members.

A list of eleven new members from among the sugar technicians has already been forwarded to the Head Quarters. The next list is expected to follow soon.

Khamaria

Introduction :— The Association of Scientific workers, Ordnance Estts, Khamaria came into being in Nov. 1949 The Association got its recognition in 1950.

Composition:— The Association draws its membership from three Ordnance Establishments viz.

1. Ordnance Factory, Khamaria
2. Technical Development Establishment, (M. E.) Khamaria.
3. Technical Development Establish ment (Ammn.), Khamaria Wing, Khamaria.

The Association has on rolls members prawn from different categories of staff viz.

1. Foreman
2. Asst. Foreman
3. Chargeman } Non-Gazetted members
4. S.S.A.,J.S.A.GR.I.
5. Supervisors
6. J.S.A. GR. II } Non-Industrial Estts.

The total strength of membership on rolls to-day is 106.

This indicates that the Association does not differentiate between the different categories of staff but is a class in itself representing the qualified personnel employed in the Ordnance Establishments, Khamaria.

Activities :— The Association arranges for Technical Film shows. During the current year nearly 12 films shows have already been shown to the members. Almost every

alternate month two or three films are shown which is generally an insteresting programme for an hour and a half.

Trade Union Activities:—On this aspect the Association is not able to achieve much as the Supdt. O.F.K. considers this Association mainly a cultural and scientific body and not a Trade Union. On this account this Association has not been granted seats in the various committees formed for the welfare of the employees. The matter does not end here itself, even the ordinary letters written by this Association to the Supdt. are not replied. This is a very disheartening factor in the life of the Associaion.

However, this Association could arrange an interview with the Administration Improvement Committee formed by DTD and could voice its feelings in the interests of the members.

Unless and until the the trade union activities of this Association are given an impetus it is felt that the very existence of the Association shall be at stake. Advice on the matter from sister organisations and our headquarters is requested.

Vijnan-Karmee : We get 15 copies of the Vijnan-Karmee from A. S. W. I. Delhi These are distributed among the members with a request to circulate to other members and friends. It is very difficult to say whether these are appreciated by the members as no comments have ever been received from them. The feeling of the executive committee members is that if more space is alloted to trade union functions of this august body, there can be much interest created amongst the members.

With all our shortcomings and handicaps this branch of the Association is proud of its little achievements and has an idea to overcome all odds and progress on the road to success.

Lucknow

Report of activities for July' 54-Nov. '54.

The Annual General Body Meeting of the Lucknow Branch was held on the 10th May 1954 and the new Executive Committee was elected after passing of the balance sheet and the Annual Report.

The Branch Executive Committee has met five times during the period under report. Two meetings were devoted entirely for the discussion of the action to be taken by the Association on the representation made by certain members of the Staff of the Medical College on their retrenchment from service. The first meeting was in connection with drawing up a programme of activities for the year. The Branch Executive held a special meeting during the visit of the General President.

General Activities: The following lectures were delivered under the auspices of the Association:

1. Dialectical Materialism and logical Positivism by Shri Jagjit Singh

2. Scope for Industrial and Scientific training in the Soviet Union by General S.S.Sokhey.

3. Experimental Peptic Ulcer by Dr. Nasset

4. Insects and Nutritional Research by G.F.Fraenkle

5. The Dropping Mercury Electrode and its Applications in medicine and biological research by Dr. G.R.Doss

6. Leaf Proteins by Prof. N.W.Pirie

Trade Union Activities: The retrenchment in staff in the Medical College consequent on the abolition of the B.M.B.S. course was taken up by the Association and a deputation consisting of the past and present Presidents of the Branch along with some lea-

ding members of the Profession waited upon the Vice-Chancellor of the Lucknow University and presented a memorandum setting out the stand of the Association on this issue. The General President Dr.Sokhey during his visit to Lucknow contacted the authorities concerned to place before them the views of the Association. At a recent meeting of the Branch Executive it was decided to issue a printed memorandum detailing the case and seeking the reemployment of the retrenched staff.

The C.D.R.I. Unit of the Branch held one meeting to discuss revision of salary scales for the scientific staff. Certain concrete proposals towards the rationalization of salary scales have been put forward and the Director of C.D.R.I. has assured the members that he would submit these proposals to the C.S.I.R.

Other Activities: The Branch Executive had constituted a small subcommittee to collect news items and other matter for publication in the Vijnan Karmee. This committee had periodical informal meetings. The committee appointed by the Branch Executive to implement the social survey programme of Scientific Workers of Lucknow met only once and no effective steps have been taken so far to carry out this programme.

Poona

Under the auspices of the Association of Scientific Workers of India, Poona Branch, a public meeting was held in the Amphitheatre of the Fergusson College, Poona 4 at 6-30 P.M on Saturday the 25th December, 1954 when Prof.J.D.Bernal, F.R.S., the well-known British Scientist and a Vice-President of the World Federation of Scientific Workers delivered a lecture on' Science and Planning' Dr.K.Ganapathy,. D.Sc., Director of Laboratories, Penicillin Factory, Pimpri and President of the Poona Branch of the Association of Scientific Workers of India presided over the meeting.

Professor Bernal first said that the most important problem of India is the complete transformation into a highly industrialised country as early as possible. Though enormous amount of money is being spent by foreign powers in armaments, India cannot expect any great help from foreign powers. She should try to build the country on her resources; this may be slower but is surer. Foreign capital and assistance could be sought by India under certain specific conditions and for certain specific industries. He further stated that India can buy complete plants from abroad in the initial stages, to quicken the tempo of progress. But such help should have no strings attached to it, political or military. If we do this, the country would be an 'island of industrial occupation'. Indians themselves should be put in complete charge of the plants as early as possible. Foreign firms do give help on attractive terms with many ulterior purposes but we should weigh these things very carefully.

Referring to the present position of unemployment of scientific persons in India, Professor Bernal said that it is fantastic that in a country like India which is on the threshold of great industrialisation and in need of enormous number of scientific men, there is unemployment of scientific men.

Referring to planning, Professor Bernal said that Planning is not some obstrusive concept but a quantitatively measurable thing; the needs could be estimated in terms of requirements of materials, man-power and money. There is a solid basis to base our plans on. For financing the developments, there should be priorities,and expenditures in many directions may have to be curtailed, and there should be large investments in the heavy industries. Referring to planning in India, he said that in India those who are associated with planning are the statisticians and economists but there are no scientists who should also legitimately be there. The first essential for planning is the assessment of our resources and he drew

attention to the importance of geologists in this venture. In building the plants we should have also an eye on the future because in many cases, the plants become obsolete before the schemes are executed.

Professor Bernal stressed the great importance of research relating to every industry and the research policy in the Country. Referring to the research in India, he said that we have magnificent laboratories and also very good individual researchers producing good work but collectively and quanti tatively, they do not add up to much.

He referred to the textile industry and optical industry wherein we can have a number of auxilliary industries and also build them up to be self-sufficient. Referring to China that she was able to develop a fine optical industry in just two years, making their own cameras and student microscopes, he pointed out that India could do the same easily. Referring to the film industry in India, that it was second largest in the world, Professor Bernal said that we should take up the manufacture of the films in India and thus save a large amount of foreign exchange.

India, he stated, requires *three types of work* to be undertaken. *First* there should be rapid assessment of her resources. He said that till about last year, we did not know about resources in lime. Referring to China, he said that they attach great importance to geology and they have a Ministry of Geology. *Secondly*, the heavy industries should be taken up first and the others planned around it. Referring to atomic power, he said, it is sure to be a practical reality in about ten years. He also said that we are wasting our coal resources by not utilising it economically as a source of energy. Coal could be gasified underground and the gas pumped to all places. *Thirdly*, he laid great stress on the biochemical and biological industries. Referring to research in soil, he deplored that this very important subject has not been given as much attention as it should have been.

Just after the speech, Professor Bernal answered a few questions put by the public.

1. To the question about the existence of the Association of scientific workers in China, he said that the Societies of Science in China have a social function in the economic and scientific progress in the country and in almost all towns there are branches of the Societies and there are more than 100,000 members in all.

2. To another question on the function of the British Association of Scientific Workers, Professor Bernal replied that the functions of the British Association of Scientific Workers are mainly trade union, striving for the economic betteerment of members. He also mentioned that the Institution of Professional Civil Servants (I.P.C.S.) plays an important role in reddressing the grievances of public servants in civil service and that there is close collaboration between the trade unions and the I.P.C.S. Tne Trade Unions never felt the necessity for a strike in the last 14 years in Britain.

3. Referring to the fact that the Government of India has not recognised the Association of Scientific Workers of India and that it has an important bearing in increasing the membership of the Association at various branch levels, Professor Bernal said that the Association of Scientific Workers of India, however, should go ahead with the representations to better the conditions of its members.

4. To a question put as to what extent the foreign capital is utilised in China, while in India, the country is paying every year heavily in the form of interest to the foreign capital without much benefits, Professor Bernal said that only Soviet Union is helping China in their industrialisation and that the Chinese are gradually becoming independent.

5. Replying to a question whether Prof. Bernal knew anyting of the advancement of Agricultural Science in India which could be utilised by the layman, he said that he was not aware of the details but said that since the Country is mostly agricultural one like China, there is a great need for the application of Scientific Research. Referring to

Bangalore Diary

The Bangalore branch of the Association of Scientific Workers of India was indeed extremely active during this month (Dec-Ed.) when the members of the Association had the benefit of inspiring lectures and personal discussions with scientists keenly interested in the welfare of scientific workers the world over. Mr. Radomir Senich of the Faculty of Forestry, University of Belgrade, Yugoslavia, who has come over to the Indian Institute of Science as an exchange scholar to work for a short time, gave an interesting account of the present position of Science and scientific workers in Yugoslavia. Mr. Senich described the structure of University education in his country and explained that the students were working 58 hours per week plus six hours of practical training on all days except Sundays. The scientific workers were helped considerably by the State in pursuit of studies. A noteworthy feature was awards for the best work of scientific worker to stimulate and sustain interest in scientific work, where greater emphasis was laid on harnessing science for the development of the country.

Professor J.D. Bernal met the scientific workers here and had an informal discussion on problems pertaining to the organization and the role of the Association in the betterment of the country and the lot of the scientific workers. He addressed the Association on "Recent Advances in Crystallography". During the course of a thought-provoking lecture, he focussed attention on recent lines of work under the general headings of techniques, function of hydrogen, and chemical and biochemical work. He delved deep into electron-optics, mineralogy, physical chemistry, biochemistry and virus research and though he emphasised that China, he mentioned that research in Agriculture is properly utilised by the layman at all stages and several provincial agricultural cntres help in this cause effectively.

6. In reply to another question on the co-ordination of Scientfic Research and applition in Britain, he said that to a great extent this problem is tackled effectively. He also mentioned that a proposal is in hand to create the Parliamentary Scientific Committee containing equal number of Parliamentary member and members of the Association of Scientific Workers, to consider properly before legislation on all scientific aspects.

Dr.K.Ganapathy heartily thanked Prof. Bernal on behalf of the public and the Poona Branch of the Association of Scientific Workers of India for the interesting and thought-provoking lecture.

Republic Day

Under the auspices of the Branch the Republic Day was celebrated on the 26th January, 1955 in the Deccan Gymkhana Pavilion Hall, Poona 4 and Dr. V. V. Virkar presided over the function.

The function was informal and the opportunity was taken to discuss mainly the message of the Prime Minister of India given at the Baroda Session about creating the scientific temperament in the masses. Many of the members participated in the discussions.

After the above discussions the following resolution was unanimously adopted.

To day we, the members of the Poona Branch, pledge ourselves anew to our Republic. Our services had their roots in slavery and suppression, from which a clear break has not yet occurred, fearless, truthfull and above corruption completely.

We will be fearless, truthful and above Corruption and thus serve the Republic.

In this, we seek the help from God above and the Government below.

In token hereof, the followlng members of the Poona Branch will be giving their blood to the Blood Bank at the Sasoon Hospital, Poona 1.

Shri R. P. Paeehe ; Shri Bhushte V. D. ; Shri G. L. Joshi ; Shri P. D. Kolhe ; Shri V. S. Karndikar ; Shri J. B. Soman ; Shri G. L. Joshi ; Shri Nair.

modern methods have contributed to the gaining of a better insight into the structure of matter, he left the audience wondering as to his thorough grasp of the details in several fields of learning and his mastery of the techniques.

Another scintillating lecture by Professor P.A.M. Dirac was on the fundamental particles. In a clear exposition of the composition of matter, right from the start to the present state, the Nobel Laureate was modest enough not to mention his own contribution to knowledge and the association of his name with Fermi, in the now classical Fermi-Dirac statistics of the atomic world ! He gave a resume of the present state of theoretical physics and the possible lines in which it could forge ahead in future. Professor Dirac has been in India for some months and it is earnestly hoped that specialists would have derived maximum benefit from this giant star in the galaxy of mathematical physics.

The Indian section of Electrochemical Society of America had a meeting where the spotlight was on the ferromanganese industry in India. The structure, nature and the economics of the industry were clearly expounded. The Wright Memorial Lecture was given on the construction and design of wind tunnel under the auspices of the Bangalore branch of the Aeronautical Societies of India. There was also a discourse in the metallurgical seminar on aluminium coating of steel, which is a subject attracting attention at the moment.

The scope and functions of the Scientific Information Department of the Academy of Sciences, U.S.S.R., were outlined by Professor Panov during his recent visit to Bangalore. He said that scientists in Russia were kept abreast of current additions to knowledge through the innumerable abstracting journals published in Russian, in addition to helping scientists in translation of other work. Besides, the Academy pubished its own original journals in the natural and engineering sciences. The visit of the Soviet steel experts to the Mysore Iron and steel works, and to the lignite deposits at Neiveli in Madras State should be mentioned. It is learnt that the experts, considered the manufacture of iron and steel utilising the now-idle iron deposits at Salem with the help of lignite in the state. Though the Government of Madras are pressing for the establishment of an iron and steet industry in that State, it is perhaps too early to know the mind of the Planning Commission and the Central Government.

It must be pointed out that quite a stir has been caused in the circles of scient s s and scientific workers here through the publication of a critical communication in the columns of the "*Hindu*", Madras, from a New Delhi correspondent. The letter is reproduced below, and I refrain from comment and leave the readers to form their own reactions.

Science in India

Sir—I am unable to share the optimism expressed in your leading article entitled "Science in India".

While the establishment of the great national laboratories is a matter of which our Government can be proud, the quality of work produced in them has been sadly incommensurate with the very large investments made in them by a country which can ill afford all that money. Only occasionally does one come across a really good job having been done—most of the time there is an attempt by the personnel of the laboratories, as well as by the C.S.I.R., to embellish the reports of work by platitudes in order to give a wrong impression on the calibre of the work done. I have found several distinguished scientists from abroad maintaining a judicious silence on their impressions of the work done, while admiring the excellent buildings that constitute the laboratories.

In the Universities too, except in a very few of them, the average standard of scholarship displayed is really poor. In my opinion, the causes can be attributed to the wrong choice of personnel at the top. Some of the scientists in our country who are at the helm of affairs to-day, while they have earned enough reputation for their work in their young days, are just not in-

terested in the future of science in India. Any little interest displayed in the future is purely dominated by personal considerations. I have noticed that the National Laboratories are more afflicted with this than the Universities. One is surprised to note the large degree of disappointment existing among the younger men in laboratories as the seniors are not interested in guiding them to greater scientific achievements.

While our scientists can be second to none, their potentialities will remain undeveloped if no efforts are made to introduce discipline and planning in our scientific organisations and institutes, and if no interest is taken by the senior scientists in the development of the spirit of research among the younger men of science.

C. V. Dattatreya.

New Delhi. Hindu 12-12-54

Perhaps I should add without prejudicing them, that in my interviews with several scientific workers they have, as one, echoed the bold voice that has been raised. Will it be a lonely voice ? A columnist in a recent edition of the "*TIMES OF INDIA*", Bombay, asked, "When do scientists cease to be scientists ?", and he supplied the answer, "When they become politicians". I would commend to the Association and to the Workers to devote some thought to this vital problem, in the solution of which lies the salvation of the scientific workers and nay the country itself !

Bangalore, N.R. Srinivasan
27-12-54-

Science Writing

In the last few years pointed emphasis has been laid by leaders of thought the world over, that a broad understanding of science and the role of science in relation to society is indispensable for men and women of today. While India's contribution to the cause of world peace is written in letters of gold, her contribution to the better understanding of science is, perhaps, not so well-known. It is indeed remarkable that India, not so advanced in science as some other nations of the world, should have taken the lead in recognizing the paramount need for creating public understanding of science through the institution of the Kalinga Prize. The coveted award administered by UNESCO goes annually to one who has rendered outsanding service in the dissemination of science. This year's recipient is Mr. Waldemar Kaempffert, Science Editor on the '*New York Times*'. This septagenerian has interpreted, during the past thirty years, the latest discoveries of science to American audiences through his newspaper columns and popular books. He visited India under the terms of the award to deliver special lectures at the Indian Science Congress Session and elsewhere. In Bangalore he addressed the Indian Institute of Culture on 'Science and Peace' wherein he said that "Scientists should organize themselves and find out the cause of war and device ways for the establishment of world peace. Such "Operational research" for establishing world peace was possible by scientists because they had the capacity to rise above petty prejudices and work for good". There was a symposium under the same auspices on "A" for atom. The occasion of the visit of the "Grand Old Man" of science writing was availed of by this writer in discussing problems, in a special interview, on the dissemination of science in our country. Mr. Kaemffert felt that though science writing of the type known across the Atlantic was not practiced in this country, nevertheless with the development of industries and institutions for science, talented young people would be required in this new profession in India. When the writer showed him the *VIJNAN-KARMEE* and some pieces of science writing therein, he expressed appreciation at the efforts that were being made by scientific workers in the country for strengthening the official organ and the Association for service in the cause of the betterment of India.

Molecule and Atom

The Bangalore branch arranged a special lecture by Professor Linus Pauling on "Abrnormal Haemoglobin in Relation to Disease". Professor Pauling described in detail in an exquisite talk the structure of the different kinds of haemoglobin found in man and animals. He nar-

rated the developments regarding the discovery of sickle cell anaemia and the molecular nature of the cause of the disease. He also described other types of abnormal haemoglobin structures. Digressing for a while on the fundamental concepts, philosophy and the place of science in the modern world, he said the greatest reason to pursue scientific research is that it has cultural value. He pleaded for the development of pure and applied science in a planned manner and the utilisation of the results of scientific research for the well being of mankind.

Professor T. Watanabe in a poignant exposition described the geological effects of atom bombs on the two Japanese cities of Hiroshima and Nagasaki. The heat from the bomb was responsible for melting bricks, tiles and refractories near the explosion centre. He described how geological principles like exfoliation had been utilised in learning about the explosion of the bombs and details connected with loss of life and property. It was indeed refreshing to hear that complete renovation has been undertaken and completed and today the two cities were humming with life and activity. It must however be recorded here that the geological studies conducted and the exposition given were purely objective and strictly scientific in character, without giving even the remotest hint of the passions and pathos involved in this grim struggle.

Among other lectures during the month mention may be made of "genetical architecture" by Dr. S. C. Harland F. R. S., Professor of Botany, University of Manchester. The principles involved in gene mutations with special reference to economic crops were clearly enunciated and illustrated. In a humorous analogy the speaker refered to three kinds of genes which build up species viz., the dictator genes, the democratic genes and anarchic genes. In another lecture Professor Auger, Head of the Natural Sciences Division, Unesco, Paris, detailed his experiments with cosmic rays and the theories of origin of cosmic rays. Lastly it must be mentioned that the Bangalore branch at a party bade good bye to two active members who have accepted positions elsewhere and wished bon voyage to two others who are shortly proceeding to United States for higher attainments.

Bangalore 3 N. R. Srinivasan
January 27, 1955

Greetings from W. F. S. W.

A Telegraphic Message of greetings has been received on 5th Republic Day of India by the Associationof Scientific Workers of India from Academician I. Malek, Regional Secretary of WFSW for Soviet Union and the Eastern Peoples' Democracies.

Dear friends, permit me on the occasion of 5th anniversary of proclamation of Republic of India to tender you and all Indian Scientific Workers sincere congratulations and wishes of success in your work on behalf of the Regional Centre of WFSW and my own. We have always valued very much Indian initiative for the promotion of International Scientific Relations and peace in the world.

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Association of Scientific Workers of India

NOTICE

The attention of every member of the Association of Scientific Workers of India is drawn to the following :—

'The Council of the Association of Scientific Workers of India had recommended the following amendment to rule No. 6 of the Constitution to the General Body meeting to be held at Baroda. The members present in the General Body meeting of the Association held on 5th January, 1955 decided that the proposed amendment should be published in Vijnan-Karmee for eliciting comments from the general membership of the Association on it.

The proposed amendment to rule No. 6 reads as

"Associate membership shall be open to any person not eligible for ordinary membership, who should Ordinarily be at least a Matriculate and engaged in a technical capacity under the supervision of a person qualified for Ordinary membership and himself engaged in professional work in the natural or social sciences or technology, provided always that he is not a member of another Trade Union, whose objects have not been approved by the Central Executive Committee (instead of provided always that there is no other Trade Union to which he might more appropriately belong). No person eligible for Ordinary membership shall become an Associate member; no person becoming eligible for Ordinary membership shall remain an Associate member, Associate members shall not be below 18 years of age"

As decided in the meeting the proposed amendment is being brought to the notice of the General membership and members are requested to send their comments if any, on the same so as o, reach the central office latest by 30th April 1955.

N. Singh, Secretary

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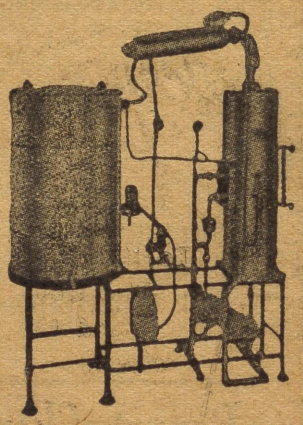

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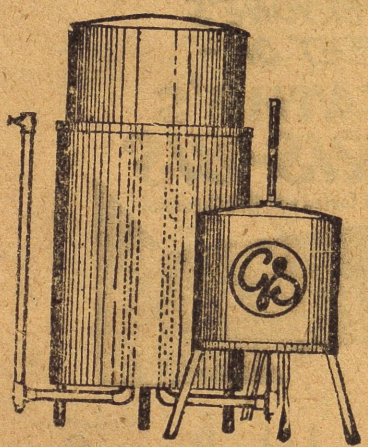

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(Founder President—Pandit Jawaharlal Nehru)

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Editorial : Asian Scientists meet

Problems of Asian Science ... *M. N. Saha*

The Hydrogen Bomb and the Future of Mankind : ... *C. F. Powell*

Radioactive Minerals in India ... *D. N. Wadia*

Cumulative Effects of Thermo-Nuclear explosions : ...*Charles Noel Martin*

International Control of Atomic Energy : ... *K. P. Karunakaran*

Unesco and Atomic Energy

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Editor

Narendra Singh



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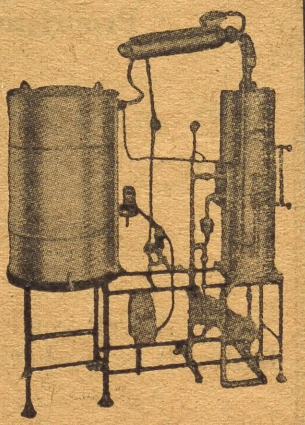

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Pandit Nehru on ASWI

"I consider it a privilege to be associated with the Indian Association of Scientific Workers. Such an Association was urgently needed in India and the Indian Science Congress has given shape to it at the right moment. It is meant to protect these workers and to help them. It is meant also for the advancement of science and the service of the community. I hope that scientific workers all over the country will join this Association and make it an active and vital organisation."

—*Jawaharlal Nehru*

विज्ञानकर्मी
VIJNAN-KARMEE

Vol. VII] April 1955 [No. 4

Asian Scientists Meet

For the first time in the history of Asia and the World, Asian Scientists and technologists are meeting in India. Scientists, Engineers and Doctors from Ceylon, China, Japan, Korea, Lebanon, Mongolia, Syria, Transjordan, Asian Republics of U.S.S.R. and Vietnam, who have come as members of the various National Delegations to attend the Conference of Asian Countries are meeting along with those from India in the Science Commission of the Conference to discuss scientific problems of common interest such as the one of increasing scientific collaboration among Asian countries, peaceful applications of atomic energy and the destructive effects of atomic and nuclear explosion, particularly the harmful effects of radioactive emanations.

On behalf of the Scientific Community of India, we extend the visiting Asian scientists a hearty welcome. It is a matter of particular gratification and pride for the Association of Scientific Workers of India that the necessity of bringing together Asian scientists to discuss common problems and the possibility of arranging this as a part of the Conference of Asian countries, was indicated in a resolution adopted at the Baroda session of the Association. We are glad that this meeting of Asian Scientists has become a reality, thanks to the sympathetic consideration which our suggestion received at the hands of the International and various national Preparatory Committees.

This meeting is of great importance to the scientific and economic development of the Asian countries.

Although Science is universal in its very nature of thought and

application, organisation and development of scientific and technological activities in Asian countries present problems much different from those met with in more advanced countries of the West. Whatever might have been the conditions in the remote past, scientific and technical development in Asian countries in more recent years bears the imprint of foreign colonial domination which has only perpetuated backwardness in these spheres. Asian scientists have all along had one-sided contacts with their counterparts in metropolitan countries rather than amongst themselves, even if they are the closest neighbours. The modern awakening in Asia and the emergence of several countries from colonial to independent status has increased the desire on the part of Asian scientists to come closer together. An increased scientific collaboration among Asian countries would thus pave the way for striking at the roots of economic backwardness and directly help raise the standard of living of the under-developed millions of Asia. We hope that the deliberations of the Science Commission of the Conference would prove immensely useful from this standpoint and the personal contacts established during the Conference would mark the beginning of a new era. We also fervently hope that this meeting of Asian scientists would give great importance to and bring into being an appropriate organisational structure for continuing the good work that has been started.

Questions connected with the peaceful applications of atomic energy are in a vital sense, of greater import to the development of Asian countries than even the more advanced countries of the West. For, the under-developed countries are, in the words of our Prime Minister, also 'under-powered'. The vast reserves of power which would be made available from atomic and nuclear resources open up new vistas of industrial and agricultural development which is of particular significance in these countries rather than in the West with other sources of power already in a highly advanced stage.

Likewise, the question of the destructive effects of atomic and nuclear explosions is of immediate interest to Asia, in view of the fact that Asian soil has been the victim of not only the first atomic bombs dropped on Hiroshima and Nagasaki but even of subsequent experiments on the hydrogen bomb explosions. The particular responsibility of apprising humanity of the harmful effects of such experiments with facts and figures, and of warning, on this basis, against a drift towards self annihilation rests on the shoulders of Asian scientists, irrespective of their scientific disciplines or social beliefs.

We feel sure that the meeting of Asian Scientists will give a lead on all the afore-mentioned questions.

We wish the deliberations every success.

8-4-55

Problems of Asian Science,*

M. N. Saha.

Fellow Delegates from Asian Countries,

On behalf of the scientific workers of the Republic of India, I wish to accord you a most hearty welcome to the first conference of Asian countries. I sincerely hope that you will enjoy your stay here, pay visits to our institutions, and will have heart-to-heart talk with fellow scientific workers. I hope that as a result of our talks and discussions, it will be possible to evolve a fruitful line of action for the benefit of all Asian nations.

No room for Complacency : Asia has been long recognised to have been the home of most of the civilising principles viz. the principal religions, most of beneficient social laws, and current philosophies of life. What has been recognised is the great contribution of Asian countries to the foundations of Science and Technology. It is also tragically true that within the last four hundred years, the contribution of Asian countries to science and technology has been rather negligible compared to that of Western Europe and United States of America—a cruel fact for which the Asian countries have paid dearly. But let us hope that with the collapse of colonial rule, we shall be able to make up our past deficiencies, work out a better life for ourselves, and make fundamental contributions to science and technology.

There is however no room for complacency. Most of the Asian countries have achieved political and social freedom, but not economic or technical freedom. And yet we know that without economic freedom which cannot be achieved without a technological revolution, our political freedom is at the mercy of predatory powers. The 'Devil is not yet dead' but is only suffering from a protracted swoon, the result of the second world-war.

Social Consciousness : The problem of most Asian countries, if we leave aside Japan, and the Asian countries of the Soviet Union, is technical backwardness, which we must overcome, if we have to live. For this, we require intense cultivation of science and technology, and its application to all walks of life. The scientist can no longer live in an Ivory Tower, as did the medieval scientists, to investigate and find out the laws of the mysterious world nor can he, like the scientists of the nineteenth century, take pride in academic isolation, enabling him to concentrate his whole attention on his problem. He must also be alive to the political and the social consequences of discoveries in science and technology, and should not leave the direction of affairs entirely to politicians, otherwise the tragedy of Germany may repeat itself in one or the other form.

Technical autonomy : The greatest need of all Asian countries, if we leave aside Japan, and the Asian countries of the Soviet Union, is the development of the enormous natural resources of these countries to promote increased production of power, transport facilities, and in agriculture, and above all in industries. The greatest handicap is neither want of capital, nor lack of incentive - but technical backwardness. For every industrial venture, for every large scale reclamation measure most Asian countries have to depend on Europe and America, for personnel, design, machinery and equipment. We must devise ways and methods for overcoming this hurdle. It can be done, as Soviet Russia, and Japan had actually demonstrated, in the period

** Speech delivered at the Plenary session of the Conference of Asian Countries in New Delhi on 7-4-55.*

between the two World Wars, and our great neighbour China and ourselves are actively devising measures to overcome this greatest of handicaps.

We have thus all a common objective—to achieve technical autonomy, and wage a war against poverty, malnutrition and unemployment with the aid of science and technology. We have also another common objective - to avoid wars, and work for peaceful co-existence.

Scientific collaboration : Much can be achieved in a Conference like this towards the achievement of these objectives. In this age, no country can be self-sufficient. We can discuss how Asian countries can form something like a common pool from which to draw either on monetary or exchange basis - economic minerals and natural resources - like iron, coal, minerals, and atomic energy materials-for the natural benefit of participating countries. We can also exchange thoughts on the development of atomic power for peaceful purposes for the benefit of Asian industrialisation. We can also arrange for the training of technical personnel, and exchange of such personnel for mutual benefit.

In the past and this century, we Asians are all overawed by a sense of Euro-American superiority in science and technology, that it becomes also unbelievable that even for hundred years ago, Asian countries were considered by Europeans themselves superior to the western nations almost in every aspect of life. It was the prosperity of the East which excited the cupidity of the west, and led them to the predatory adventures on a global scale. The last remnants of these adventures which meant so much misery for the people of the East have not yet completely disappeared.

It was the East which gave astronomy, the decimal notation, the medical sciences, chemistry or its predecessor alchemy, the magnetic compass, the printing press and paper to the West, which became mighty weapons for development of the human soul. But the advantages of the discoveries have been mostly reaped in the West. We have now to start the reverse process.

Practical Suggestions : I make the following practical suggestions to the end. They should be taken on the Government level.

(a) That there should be share of technical and scientific information amongst Asian countries on an intensive scale.

(b) That there should be extensive exchange of technical and scientific personnel amongst Asian countries in the form of visiting professorships, short time engagement of engineers and technicians ;

(c) Creation of travelling fellowships and studentships.

Other suggestions will be forthcoming in course of discussions.

It is a matter of sincere gratification that the Soviet Union has joined the United Nations' Extended programme for technical aid to underdeveloped countries, and for this purpose has contributed 4 million rubles (app. 1 million dollars) a year for the last two years. This money is available for the training of the scientists and technicians of Asian countries, including India, in the Soviet Union, as well as for the services of Soviet Experts for development works in India and for the supply of technical equipment.

Technical education is never complete without practical training in factories, and underdeveloped countries know fully well how difficult it is to arrange for factory training in capitalistic countries. For this reason, technical education in the Soviet Union offers far better advantages over that in capitalistic countries, and should be availed of in increasing tempo by our country as well as other Asian countries which have nearly identical problems.

The Prime Minister of India and China jointly issued on June 29 of last year the celebrated principles, now known to the world as "Panchasila" or five basic principles. They have been accepted by most of the Eastern Nations including Soviet Russia and Yugoslavia. The fourth of these principles aims at promoting Equality and Mutual Benefit. I sincerely hope that this conference of Asian countries will evolve practical measures for giving shape to these principles.

The Hydrogen Bomb and the Future of Mankind

C. F. Powell.*

CECIL FRANK POWELL, M.A., F.R.S., is a Melville Wills Professor of Experimental Physics, University of Bristol. After graduating he carried out research under Lord Rutherford and C. T. R. Wilson on condensation phenomena.

He moved to Bristol in 1927 and worked under Professor Tyndall on the mobility of ions, developing a new and accurate method of measuring their mobilities.

In 1945, with Occhialini and a number of other young workers, Powell developed the technique of using photographic emulsions with increased sensivity, which were then available in an exploration of the cosmic radiation. As a result of Powell's contribution to our knowledge of cosmic radiation he was awarded the Hughes Medal in 1949 (in the same year as he was elected to the Fellowship of the Royal Society) and later in 1950 international recognition was given to his work when he was awarded the Nobel Prize for Physics.

His interest in the social relations of science may well be summarised by a quotation from his speech at Stockholm in December 1950 on the occasion of the banquet given in honour of the Nobel Laureates:

"In all our work, my colleagues and I have received inspiration, even when we were least conscious of it, from those great aims of natural philosophy which were embodied in the doctrine of Utility and Progress, so clearly enunciated by my great countryman, Francis Bacon; from the view that the true end of the sciences is to lighten the burden of labour and enrich human life,"

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We have entered an entirely new epoch of human history which is characterised by ceaseless technical innovation, with all the perplexities and opportunities which are thus created. We have to see to it that the development of the hydrogen bomb does not mark the end of an epoch but a beginning. And any attempt to anticipate, in very general terms, the future course of events must allow for the possibility of new discoveries and innovations. Only about six years elapsed between the discovery of nuclear fission in 1939 and explosion of the first atomic bomb in 1945, and this was followed, less than ten years later by hydrogen bomb, which is about a thousand times more powerful.

The great change which came about when we began to be able to get power from the atom was that, in effect, we discovered a new fuel—or a new explosive—which gave us about a million times as much energy—weight for weight—as the ordinary fuels like coal. This was brought about because we were able to change atoms—and, in particular, the innermost structure of atoms called the atomic nuclei. Whereas ordinary chemical processes, like burning, leave atoms unchanged and only cause their re-arrangement in different combinations, the new processes led to a radical transformation of the individual atoms—to their disintegration: and the yields of energy were very much bigger than anything of which we had previously any experience; weight for weight, a million times more.

Now the ordinary atomic bomb, although of such tremendous destructive power, did not go right outside conventional military thinking. Its effect was similar, in some respects to that of a very large raid with ordinary bombs; and it was difficult, for the following reason, to increase greatly the size of such bombs. An ordinary explosive, for industrial or military purposes, must not be too unstable. It must be possible to transport it, even under difficult circumstances, without fear of it exploding prematurely. At the desired instant, the main charge is set off by means of a detonator, a small quantity of a suitable substance of which the explosion sets off the main charge. And there is no limit in principle to the size of the main charge which can thus be ignited.

The ordinary atomic bomb works quite differently. The charge consists of blocks of uranium or plutonium metal of special types which have the peculiarity that they explode spontaneously if they are made to exceed a certain size—a so-called "critical size." The explosion is therefore brought about by driving suddenly together two or more pieces each of which, separately, is less than the critical size, but which together exceed it. The size of an ordinary atomic explosion cannot therefore be less than that corresponding to a block of the critical size; and it cannot be very much greater because, for technical reasons, it is difficult to make large the number of component pieces to be driven together. So the explosion, whilst very great compared with an ordinary high explosive bomb, is limited.

The Hydrogen Bomb.

The limitation to the size of the explosion which

** Extracts from a Speech delivered on 26th February, 1955 in the Central Hall, Westminster for the Education Department of the London Co-operative Society.*

can be brought about with the ordinary atomic bombs has now been removed by the development of a completely new device called the thermo-nuclear or hydrogen bomb. This works in the following way.

We have seen that an ordinary explosive depends upon a detonator which, at the desired moment, produces a small violent disturbance of the main charge, sufficient to set it off. Now it has been known for about 20 years that some compounds of the lightest atoms which occur in nature, notably hydrogen and lithium, could be made to explode if they could be raised to a sufficiently high temperature It was recognised that there would be a great release of energy through the coming together—the fusion—of their atomic nuclei. Such processes are known to occur in the central regions of hot stars, such as our sun, where the temperatures are about 20 million degrees centigrade : they are known as thermo-nuclear reactions; "nuclear" because, unlike ordinary chemical changes, they involve the atomic nuclei, and "thermo" because they proceed only as a result of great temperatures. It is these thermo-nuclear processes, and the release of energy which they produce within the sun, which maintains the heat and light continuously emitted by the sun, and which therefore makes possible all life on earth.

When the possibility of a "thermo-nuclear" explosion, using light atoms, was first realised, it seemed unlikely that it would be produced in practice, because there appeared to be no way of generating the necessary high temperatures. The highest temperatures produced on earth by conventional methods are about 30,000 degrees centigrade, and to produce a thermo-nuclear reaction required a temperature at least a thousand times greater.

With the development of the atomic bomb, however, it was recognised that for a very short interval of time temperatures occur at the centre of the bomb which are much greater than those at the centre of the sun. The possibility therefore became apparent that if an atomic bomb were surrounded with a mass of substance composed of suitble atoms of hydrogen, or of hydrogen and lithium, a thermo-nuclear reaction might occur. An ordinary explosive is set off with a detonator; the ordinary atomic bomb was to be the detonator of the hydrogen bomb.

As we all know, these anticipationss have now been realised. There is no authoritative statement on the history of the developments which led to the production of the hydrogen bomb, or of what it is constituted. According to plausible accounts by responsible American journalists, however, the first American attempts were made by surrounding an atomic bomb with different kinds of hydrogen. This attempt was partially successful; and a device of this kind was exploded at Eniwetok, an island in the Pacific, in 1952. In 1953, however, a great explosion was produced in Siberia which employed a compound of lithium and heavy hydrogen, called lithium deuteride, as the main charge. It appears that the American found traces of lithium or beryllium in the atmosphere at great altitudes. There were great advantages in the new method, and the Americans detonated a similar device about nine months after the Russian explosion.

Although some of the details in such reports may be questioned, there seems now to be no doubt about two essential points. First, that it is possible to detonate a main charge consisting of the lightest atoms found in nature. Secondly, that whilst the substance of the main charge does not occur in nature in an immediately usable form, so that there is no possibility of an uncontrolled thermo-nuclear reaction being initiated which would destroy the globe, the substance can be prepared in substantial quantities relatively cheaply as compared with the special uranium and plutonium required in the atomic bomb. Thirdly, that in such thermo-nuclear reactions, there is no limit to the size of the explosion which it is possible, in principle, to produce. The limit to which the ordinary atomic bomb is subject is thereby removed.

The consequences of these developments are very profound: Whereas the atomic bombs dropped on Japan were equivalent to about twenty thousand tons of T.N.T., a hydrogen bomb has already been exploded which was equivalent to 20 million tons. Whereas an ordinary atomic bomb was equivalent to a heavy raid by about 2.000 aircraft, each carrying ten tons of bombs, a hydrogen bomb had already been exploded which was equivalent to 1,000 such raids. The figure for the destructive power of this bomb—20 million tons—is 15 times greater than the total weight of bombs dropped on Germany during the last war by all Allied aircraft put together, namely 1,300 000 tons : it is about 100 times the total weight of bombs dropped by German aircraft on British cities during the same period, 200,000 tons,

Present indications suggest that in the course of a few years—and in the absence of war, and of an agreement between the powers—we shall reach a situation in which several of the major powers will be equipped with hydrogen bombs in sufficient numbers to destroy completely the main centres of population and industry of its enemies; that they will be in a position to deliver these bombs, without warning, by high-speed projectiles from launching sites invulnerable to attack. We should then have reached the position of "push-button" warfare, where statesmen will know that they can utterly destroy an enemy in the course of half an hour, and that their own country will suffer the same fate immediately afterwards. This is, of course, not a prospect for the immediate future, but it is not an unreasonable forecast on the basis of present developments and tendencies. Once again, it may be

emphasised that it is a view necessarily limited by present ideas which takes no account of really new developments.

The Peaceful Applications of Atomic Energy

As examples of peaceful applications of atomic energy, we now begin to use the radioactive substances from the atomic piles—the prototypes of the power-stations of the future—in our hospitals and research institutions; they can be employed in a number of ways in the diagnosis and treatment of diseases, and they begin to take the place of our X-ray tubes. A whole new science is growing up which employs them to trace out what happens in biological processes and which gives us a detailed insight which was previously impossible.

The knowledge thus gained will certainly be of great importance in many branches of medicine. Illustrations of this kind could be multiplied, but it is in the field of power production that the most striking applications have been made.

You will know that a small station of 5,000 kilowatts, using atomic fuel is already in use in the U.S.S.R., and that a larger station of 50,000 kilowatts will come into operation in this country in a year or two. These will be followed by a rapid development, so that within 10 years we shall have 10 or more stations with a total capacity of 2 million kilowatts, and in less than 50 years most of our power will come from such stations.

Already very important technical advances have been made, so that it is probable that all the uranium and thorium found in nature can be made available as fuel, instead of only about 1 per cent of the uranium which had at one time seemed possible. This will greatly increase our power reserves, for the known uranium and thorium deposits should be sufficient to supply all the world's estimated power requirements for more than a thousand years, even without any major technical innovations.

But such a list of the positive contributions from atomic energy would appear as a poor compensation for our present dangers and anxieties if they were the only advantages we might expect to enjoy. In this sense, such an account is quite misleading. It always takes time for the full implications of a great discovery to be made clear and to be applied.

The same uranium or plutonium metal which forms the charge of an atomic bomb can also be the fuel for our atomic power stations; we can use it for the one purpose or the other. But we cannot yet use for peaceful purposes the thermo-nuclear reactions which operate to produce the explosion of a hydrogen bomb.

A heavy responsibility rests also on those of us who have some small understanding of the great issues which are in suspense. A measure of agreement between the powers has been reached, but progress has been slow, and time is not on our side. We still do not know whether we shall advance to the happy future that is within our grasp or whether civilisation will be destroyed, so that a bruised and scattered remnant of humanity will slowly recover to begin life again in a new and strange world where our own times will be hardly remembered.

In a situation so precarious, small forces can turn the balance, and our prospects will be brighter the more people are convinced, and the more firmly and untiringly they insist, that international agreement on atomic energy can be brought about, that it is essential for our survival; and that it must be achieved in a form which respects the freedom and independence of all peoples to determine their own destinies.

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are recognized since 1911 to be the richest and most extensive source of monazite so far known in the world. The exact estimate of the total reserves of thorium and uranium involved in these deposits is being investigated.

Experiments have been in progress at various research centres for the isotopic transformation of thorium atom into U-233. Such conversion of thorium into utilizable atomic fuel is at present an experimental possibility in Reactors, for large-scale manufacture of nuclear power. When the laboratory experiments are perfected and factory-scale production of moderate-cost thorium fuel becomes a commercial proposition, India's large reserves of thorium will bring in a new era for industrial utilization of atomic power.

Radioactive Minerals in India

D. N. Wadia

Radioactive minerals form a section of the group of what are know as the Rare Earth minerals which, by reason of their containing the rare metals Uranium and Thorium, emit spontaneous (i. e. without being subjected to any outside influence) invisible radiation. In the case of radioactive minerals containing uranium the radiation emitted is of three types known as *alpha*—*beta*—and—*gamma*—rays. As this spontaneous invisible radiation is given off the uranium atom within the mineral breaks up into a series of different elements one of which is Radium; the final product of this disintegration, continued over several geological ages, is lead. In the case of thorium the spontaneous fission and radiation are more or less of a similar type. The continual loss of matter by this radiation results in the decrease of mass of uranium and thorium. The process, however, is exceedingly slow by all human concepts of time; the period required for a gram of uranium or thorium to lose half its mass, being several million years. Recent researches, mostly undertaken just before and during the last war, have shown the possibility of splitting the nucleus of uranium atom artificially by bombarding it with other atomic particles, this fission releasing an enormous quantity of atomic energy. Similar effects can also be produced by artificial fission of thorium. These discoveries and the subsequent application of atomic energy to military strategy with highly destructive effects, have emphasized the importance of uranium and thorium and have led to the discovery of mineral deposits containing these metals in unexpected quantities in different parts of the world.

Minerals containing uranium and thorium have been known in India for more than 50 years. It was in 1901 that Sir Thomas Holland first recognized pitchblende (an impure oxide of uranium) in India in a mica mine in the Gaya district of Bihar. Since then numerous cases of uranium occurences have come to the notice of geologists, especially of minerals containing oxides, phosphates, niobates and titanates of uranium. About 6 Cwts. of these uranium minerals was recovered from various localities during prospecting operations between the years 1910-15. The value of uranium minerals then lay in the exceedingly small quantity of radium contained in it as well as for the use of uranium salts as a delicate colouring matter in the ceramics industry.

The occurrence of thorium in India is on a far larger scale. The discovery of the valuable mineral Monazite was made rather accidentally in the year 1909. This mineral occurs as sand on the beaches of various parts of the Malabar and Coromandal coasts of the Deccan. The mineral has accumulated by a process of natural concentration along the shores out of the products of rock-decay during past ages. At several places the concentration is of sufficient richness to be worked for commercial purposes and for many years, between 1911 and the early years of the last war, exploitation of this mineral went on actively and large quantities were exported to various European countries, till all exports of monazite were banned by Government in 1945. The value of monazite depends on its containing thorium oxide as one of its constitutents, the thorium occuring in quantities varying from 5-10%, along with a minute amount of uranium.

The more important uranium minerals found are :—

Minerals containing Uranium.

Uranophane ... Uranate and silicate of lime. Colour yellow.

Fergusonite	...	Niobate of uranium and rare earths. Small prisms with sub-metallic lustre.
Samarskite	...	Niobate of uranium, iron, etc Brilliant black pitchy lustre.
Torbernite	...	Phosphate of uranium and copper. Beautiful green flaky crystals.
Autunite	...	Uranate and phosphate of lime. Brilliant lemon yellow colour.
Carnotite	...	Uranate and vanadate of potassium. In the form of yellow powder or flakes.
Uraninite (*Pitchblende*)	...	Uranium oxide with a number of impurities. The most valuable ore of uranium. Heavy black lustrous nodules or lumps.
Gummite	...	Alteration product of uraninite. Brilliant red colour.

Minerals containing Thorium

Thorianite	...	Oxide of thorium and uranium. Heavy black cubic crystals. Very rare.
Thorite	...	Silicate of thorium. Orange colour.
Monazite	...	Phosphate of cerium and other rare earths with thorium oxide. Honey coloured crystals and grains with vitreous lustre.

Uranium.

Although the list of minerals found in nature in which uranium occurs as a primary or secondary constituent is large--at least 200 distinct mineral species have been named-commercially valuable U-minerals are only about 8 or 10. The rest are only of mineralogical interest or are scientific curiosities. The occurrence of uranium in the earth's crust in the form of minerals mentioned above is generally confined to segregation veins occuring in crystalline igneous rocks of acid composition, known as *pegmatites*. The occurrence of uranium minerals in pegmatites, however, is highly erratic, only sporadic pockets, nests and grains being found, separated by barren rock at wide distances. The mining of few of these pegmatites has been found to be profitable except in the three regions of Joachimstal in Czechoslovakia, in the Belgian Congo and in the famous Eldorado deposits at the Great Bear Lake of Canada. Besides these, uranium in minute quantities is widely dispersed in rocks of granitic composition in most parts of the world, but the quantity so found in granites and gneisses is rarely more than two-hundredths to three-hundreths of one percent. Commercial extraction of uranium from these sources is, therefore, ordinarily uneconomical. A number of pegmatites containing uranium minerals have been noted in India and a certain quantity has been extracted in the past. The Mica mines of Bihar and Nellore have produced some 4—6 tons of uranium minerals in pre-war years and a mine in Ajmer produced about 100 lbs. of rich uranium ore during the War. The new uranium field lately discovered in India is still under active investigation and no particulars or exact information regarding this can yet be given.

Thorium.

The resources of India in the rare metal thorium are large, and are on a scale of magnitude that is of world importance. The principal ore of this metal - the mineral monazite - occurs in beach sand deposits, associated with the known "black sand," (Ilmenite) of the Travancore Coast, which

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Cumulative effects of thermonuclear explosions

M. Charles-Noel Martin.*

Thermonuclear explosions have attained such dimensions that they cannot be neglected on the terrestrial scale. Several cumulative facts are studied—chemical, radioactive and climatic. These phenomena are irreversible and the equilibrium of certain planetory and living characteristics will be compromised by any one phenomenon as a result of explosions. Many experimental proo.s are suggested.

The complexity of physical phenomena taking place during an explosion of fission bomb and thermonuclear bomb greatly exceed the present possibilities of calculating theoretically their effects with exactness. It is, however, possible to give the scale of magnitude to a whole group of numerical values in respect of the phenomena which appear most evident. The series of tests of thermonuclear weapons of various types undertaken recently lead one to a scientific study of these phenomena, for a few of these effects take place on a global scale and will involve as a result of accumulation of these effects quite serious, if not dramatic, consequences. These results are of four principal types.

Chemical Consequences : Even before the first experimental explosion at Bikini (till now there have been 60 of them) Prof. A. Debierne had through our Notes already drawn attention to the formation of nitric acid by the reaction of nitrogen and oxygen in the air. The nitric gas NO which gives its reddish colour to the mushroom becomes NO_2 and then NO_3H by combining with water vapour. A bomb of 20 Mt can thus form 5×10^5 tons of NO gas. The mass of terrestrial atmosphere being 5×10^{15} tons, the effect is of the order of 10^{-10} and thus appears negligible from the standpoint of mass. But that is not so, because the quantity of nitric acid formed afterwards, supposing it to be distributed uniformally in the entire atmosphere to an altitude of 10 km, gives 2×10^9 molecules per cm^3. This calculation neglects the further formation of NO_3H resulting from the ionisation by radioactive isotopes and the action of dust particles. The dissolution of this acid would bring about a diminution of PH of the rain water, which would amount to five and less for several hundred rain showers covering km^2 a short time after the explosion. We know that after a certain value of pH, the metabolism of plants can undergo a complete derangement.

Climatic Effects : The ground explosions tear off large quantities of matter of the order of milliard of tons and the greater part of it is borne upto the stratosphere 30 - 40 km high. The mushroom extends over 200 km to a mean altitude of 18 km with a thickness of 6 km. This quantity of matter, which is only 10^{-7} of the total mass of the atmosphere, is diluted rapidly but falls down very slowly making severe turns round the world. The climatic effects are evident ; partial interception of solar radiation ; localised diluvian rains in the couse of the passage of the fragments of the mushroom which carry condensation nuclei of nitric acid, radioactive ions and dust particles ; production of storms caused by the local disequilibrium of the process of evaporation and variation of mean temperature.

* *This paper was presented by M. Louis De Broglie to the French Academy of Sciences.*

Radio-active effects. A large number of isotopes are produced, which emit gamma radiation having long lives (from some days to several years); in particular however, a large quantity of C_{14} by the reaction (n, p) on the nitrogen 14 of the air. We know well the mechanism of the homegeneous distribution of carbonated products, absorbed subsequently by all living beings. The distribution of C_{14} with a life of 5,600 years will fatally bring about after few years a clear increase of the present rate of 15 disintergations per minute and per gramme of living carbon'.

Moreover, we must observe at the earth's surface a slight variation of the secondary cosmic radiation caused by the appreciable increase of the density of matter in the rarefied atmosphere between 200 km.

Genetic Effects. In this domain which is still little known, it seems that even a slight variation of the rate of the surrounding natural radiation will bring about long term genetic effects which will be considerable and irreversible. Experimental precedents are even now at hand.

To summarise, since the last 2 years there have been about 10 explosions of H. Bomb, the energy of each one of these varies between 3 and 50 Mt, that is to say, the equivalent of 2,500 'classic' atom bombs of the Hiroshima-Bikini type. The phenomena that occured go far beyond the experimental possibilities of the laboratories and involve a very appreciable section of our planet. A certain number of processes caused in the atmosphere are irreversible and may bring out an increasing diseqilibrium among the natural conditions, to which all living beings are slowly adapted themselves. Any increase in the number of explosions will result in a modification according to a law, which will not necessarily be linear.

At present we are able to prove experimentally the following effects :—

1. Local variation of the p H of the rains of the order of 7 to 5.
2. Very distinct increase in the rate of carbon 14 of the order 10—30%.
3. An increase which is difficult to evaluate and is probably slight of the intenisity of the secondary cosmic radiation at the sea level.
4. A diminution of the intensity of the solar radiation.
5. Irregular rains of which it would be interesting to note the locations all over the earth, depending on climate.
6. Observation of absorption band of the nitric acid in the sunlight.
7. Presence of numerous radio elements having very long lives in the air. In particular that of ion 59 with a life of 47 days due to the reaction N (N. y) on the stable iron isotope 58 in the metallic envelope of the bomb.

International Control of Atomic Energy

K. P. Karunakaran.*

Very few now question the view that the developments and use of atomic energy are not essentially matters of domestic concern of the indivi ual nations, but rather have predominantly international implications andr epurcussions. It is also generally agreed that scientifically, technically and practically it is feasible to bring about international control of atomic energy by providing an effective machinery for this purpose. But when it comes to a matter of deciding the degree of international con'rol necessary at present and the type of machinery which must be provided for enforcing such control, different Member-States, concerned with these questions, find it very difficult to come to an agreement.

American Plan

First take the American plan for the international control of atomic energy. This plan which had the support of the majority of the U. N. Members, recognized that the development and use of atomic energy were not essentially matters of domestic concern to individual nations, but had predominantly international implications and repurcussions. It noted that the development of atomic energy, whether for peacefull or destructive uses, had identical and inseparable productive processes up to a very advanced stage of manufacture. Considering these facts, the majority plan submitted that the international control agency should acquire ownership of all source-material from the moment it was removed from its place of deposit in nature, and that it would specify the degree of concentration at which it would take possession. The agency would have the authority to determine, in each case, whether it would own, operate and manage any source-material refinery or whether it would license its operation. Among the functions of the agency was included a thorough inspection of any part of the territory of any State, subject to appropriate procedural requirements and limitations designed to prevent possible abuse of the powers given to it. It was stated that the representatives of the international agency should be given unimpeded rights of ingress, egress and access from and within the territory of every nation, unhindered by national or local authorities. As an integral part of such a comprehensive system of control, proposals were made to prohibit the manufacture, possession and use of atomic weapons by all nations and to dispose of the existing stocks by those who possessed it. It was specifically stated that no Government would have the power, through the exercise of any right of veto, or otherwise, to obstruct the course of control or inspection. The Commission examined this plan in detail to determine how it might work in practice and sent a second report on this matter to the Security Council in September 1947.

Soviet viewpoint

The Soviet Union opposed this plan on the ground that it constituted an unwarranted infringement of national sovereignty. She submitted her own proposals for the international control of atomic energy in June 1946 and elaborated them in June 1947. Although the U. S. S. R.

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admitted that international inspection and investigation were a necessary condition of any plan of international control, she opposed the idea of continuous inspection and insisted that inspection should be confined to such facilities and materials as she would choose to declare in regard to her territories. The Soviet Union also maintained that any atomic energy authority must be subject to the jurisdiction of the Security Council.

According to the Soviet proposals, the individual States themselves would be responsible for carrying out the provisions; "supervision, management, and licensing do not follow from the tasks of strict and effective international control". The Soviet proposals also called for the immediate outlawing of atomic weapons and the destruction of existing stocks. The majority of the Members of the Commission felt that Soviet proposals were fundamentally inadequate for the control of atomic energy and that "it is completely unrealistic to expect any nation to renounce atomic weapons without any assurance that all nations will be prevented from producing them".

In the third session of the General Assembly, the Soviet Union continued to maintain that any control agency, outside the Security Council, would be American and not international in character; but she relaxed her two-year old stand on atomic energy by offering a compromise which called for simultaneous out-lawing of atomic weapons and the setting up an international control body. Although many non-Communist States accepted this offer, the Western Powers rejected it.

Indian Proposal

By 1948 these two conflicting views held by the two Big powers took very crystallized and definite shape. India was keenly interested in finding a compromise proposal acceptable to both groups because of the bearing of this question on other questions connected with war and peace. The 1948 session of the General Assembly created a sub-committee to work out a compromise resolution on this matter. The Indian delegate was elected chairman of the sub-committee. He submitted a resolution which wanted the General Assembly to approve and accept in substance the general findings and recommendations of the Atomic Energy Commission and called upon the Commission to resume and continue its work. While placing his proposals before the committee, the Indian delegate told its Members that for nations, as for men, the moment had come when they could save themseves by an act of faith. The Indian proposals were not accepted by other members. The delegates of the U. S. and the United Kingdom expressed the view that areas of disagreement between the Western Powers and Soviet Union would be widened rather than reduced by starting the Commission's work at that stage. Although the Indian resolution was not accepted by the sub-committee some willingness to compromise was shown by the Big Powers by the time the issue was again discussed in the plenary session of the Assembly in 1948. The original Western Powers' resolution would have suspended the Atomic Energy Commission and would have had the General Assembly pronounce judgement on the refusal of the Soviet Union to agree to the far-reaching control plan elaborated by the Western majority in the Commission. As a result of the efforts of Australia and India, supported by several South American States, and under the influence of the Soviet claim to be willing to compromise, the U.S., Britain and Canada agreed to hold the door open. But still they were not prepared to go as far as India. In the plenary session, India submitted a compromise proposal, recommending that the Assembly should approve the Western Powers' control plan in substance and that the Atomic Energy Commission should be instructed to draft a treaty as quickly as possible.

The Assembly rejected these proposals. It accepted the Western Power's resolution which stated that the Commission should continue its study of the subjects which it thought were useful and that the Big Five

and Canada should meet to explore whether there existed a basis for establishing an effective system of international control of atomic energy.

Importance to underdeveloped countries

It is not only India's desire for the maintenance of international peace that is responsible for its taking some definite stand on the question of international control of atomic energy. India is also keenly interested in the use of atomic energy for peaceful purposes and cannot therefore take an indifferent attitude towards the questions connected with its control. Other Member-States have also focussed attention on this matter. For instance, the Soviet Government, in its draft convention on International Control of Atomic Energy, stated that the great scientific discoveries connected with atomic energy were of great importance to underdeveloped countries. It was felt that for countries like China, India and the underdeveloped areas of the U. S. S. R. cheap abundant power, as might be available from atomic sources, could, under certain conditions be of enormous importance in raising the standard of living and bringing it to some reasonable parity with that which existed in the U. S. and Western European countries. They could not, therefore, forgo any opportunity to develop atomic energy for industrial purposes nor could they allow any international organization, dominated by industrially advanced countries, to control their activities in regard to the development of energy. The problem concerning this aspect of the matter was further complicated by the fact that, as stated earlier, the development of atomic energy, whether for peaceful or destructive uses, had identical and inseparable productive processes upto a very advanced stage of manufacture. The Indian delegate emphasized these facts during the discussion on the subject at the 1948 session of the General Assembly and said that India could not accept in its entirety the Western Powers' plan for international ownership of atomic raw materials and of the chief production processes, as atomic energy would play an important part in India because she was an underdeveloped and under-powered country. The Indian Government recognized the importance of atomic energy as a source of power and did not want it to be controlled unconditionally by an outside agency, because it would be difficult to isolate the economic aspects of atomic energy from the economic aspects of all raw materials which were of value to man.

Pandit Nehru's views

India's opposition to the degree of control by the international agency envisaged in the Western Powers' plan was more vigorously and clearly put forward by the Prime Minister during a dabate in the Parliament. The following extracts from his speech explain the Government's view on this matter. "The use of atomic energy for peaceful purposes is far more important for a country like India, that is to say, in a country whose power resources are limited, than for a country like France, an industrially advanced country. Take the United States of America which has already tremendous power resources in other ways. It is not so much important for them to have an additional source of power like atomic energy.....It is important for a power starved or a power-hungry country, like India or like most of the other countries in Asia and Africa. I say that because it may be to the advantage of the countries who have adequate power resources to restrain and restrict the use of atomic energy because they do not want that power. It would be to the disadvantage of a country like India if that is restricted or stopped. It is a very important factor to remember from the point of view of this so-called international control. It is probably loose talk, this talk of control. Who is to control it internationally ? Who are the international nations who are going to control it ? One may say : the United Nations.....the House knows, the United Nations even now does not include in its scope even the big nations the of world. Some of the biggest are kept out of its scope". In the same speech the Indian

Prime Minister made specific reference to the American proposals which suggested the establishment of an international control agency, which after being set up by the U. N., would be an independent body outside the control of the Security Council and of the United Nations. Commenting on this feature of the proposal, he added :

"The United Nations is merely supposed to set it up and wash its hands of it. It becomes an independent organisation. So it is a very important matter as to what an independent organization is. This organization will, of course, have an unlimited right of inspection.....It becomes a superstate, this atomic energy body, maintaining its own guards, armies or small armies or whatever you like. Then again, ' it shall own and control' - mark these words - 'the raw materials, mines, the plants in which the ore is processed, and all plants which deal with production of atomic energy wherever they may be situated in any country of the world'. This is a very farreaching provision, namely, that all our raw materials and our mines would be owned and controlled by an independent body, which is even independent of the United Nations after it is created. It means tremendous power being concentrated in the hands of a select body.....who will be in this body ? That is an important factor. Either you make the body as big as the United Nations with all the countries represented, or it will be some relatively small body, inevitably with the Great Powers sitting in it, and lording over it, and I say with all respect to them that they will have a grip of all the atomic energy areas and raw materials in every country. Now in a country like India, is it a desirable prospect ?... Certainly, we would be entitled to object to any kind of control which is not exercised to our advantage.....I submit it would not be right to agree to any plan which hands over even our raw materials and mines etc., to any external authority. I would again beg the House to remember this major fact that atomic energy for peaceful purposes is far more important to the under-developed countries of the world than to the developed ones. And, if the developed countries have the power they may well stop the use of atomic energy everywhere, including in their own countries, because they do not need it so much, and we suffer".

Atoms for Peace

The attitude towards the proposals for international control of the atomic energy outlined above by the Prime Minister is still the dominant view in India. India will not share with any outside agency its right to develop atomic resources to any great extent. In some recent sessions of the U. N. Assembly another question has come up - the question of the Atomic Energy peace plan. This refers to the co-operation among nations in the field of developing atomic energy for peaceful purposes. It should be emphasised that any new development in this field will not essentially change the situation concerning the machinery for international control of atomic energy, nor the Indian attitude towards it.

Unesco and Atomic Energy

Unesco's work in this sphere will form part of the general plan for the development of atomic energy for peaceful purposes, initiated by President Eisenhower, and now being worked out by the United Nations. For example, Unesco will help in the preparation, from the scientific standpoint, of working documents for the International Conference on this subject which is to be held during 1955. Together with WHO, Unesco will make a particular contribution to the study of the effects of radio-active substances in general even though this energy is to be used for peaceful purpose. Such studies will concern the effect of contamination on water, air, soil and daily food.

During the Committee debate on this subject at the General Conference in Montevideo the point was stressed that although a recommendation had been made by the U. S. Bureau of Standards regarding external radiation, no final conclusions had yet been reached about the maximum amount which could be absorbed internally without harmful effect on the body.

From the constructive standpoint, the U. S. delegate Mr. Athelstan Spilhaus of the University of Minnesota, said that enormous benefits can be obtained from atomic energy for industry, agriculture and medicine. Radio-isotopes, for example, which are by-products of atomic energy, can be used in the treatment of diseases, such as the destruction of cancerous cells. As tracers they can be used to study food production from the effect of soil and air by photosynthesis in plants, the application of which could give rise to a large increase in the world's food supply. Additionally, tracers can be used to study the earth and thus provide knowledge hitherto unobtainable, as for example in discovering the motion of very deep ocean currents which may provide the basis for understanding the heat transfer process in the oceans which, in its turn, has implications on long-range weather forecasting which would benifit agriculture throughout the world.

Mr. Spilhaus said that already 3,000 shipments of isotopes had been made from the U. S. to 50 different countries for these purposes and that the objective of the new plan for the peaceful use of atomic energy is to increase many times this kind of activity and stimulate the production of isotopes within many countries.

It was pointed out that although atomic energy is highly expensive, it stands to reason that the first areas which should enjoy these benefits should be those in which power supplies are very expensive or otherwise unavailable - for example, in the underdeveloped countries. Training, however, is essential in this new and complex power field, and for this purpose reactors working on essentially the same principle as power reactors, but smaller in design, can be built for relativey little money in various parts of the world : most fortunately, in addition to providing training such reactors can be usefully employed in the production of radio-isotopes.

Unesco was also authorised at the Montevideo Conference to carry out an information campaign about atomic energy, so that people will understand its benefits in addition to its destructive effects. It was considered that such a campaign is vital since there is widespread fear - which is bred of ignorance - of this new and complicated power. People should understand that nuclear fuel is just another, newer kind of fuel - potentially better than past fuels; potentially so plentiful that in future there should be no fuel shortages; but that like all fuels it requires careful study in handling in order to determine how best it can be employed for man's good.

At this point it may be noted that Unesco has already gained much experienec in international collaboration in the nuclear energy field through its initiative in starting the European Centre for Nuclear Energy (known as CERN) which became a reality in September 1954. Ten Member States have ratified the Unesco-sponsored Convention for CERN which is being built outside Geneva. From now on, the work of the Centre plus all costs, including $ 28,000,000 for machinery and buildings, plus an estimated annual budget of $ 4,000,000, will be borne by the Member States themselves.

The Centre's activities concern research in high energy particles at over 500 million volts. (In contrast to this, atomic energy research is carried out at approximately 200 million volts). This high energy research is a relatively unexplored field : it is also exceedingly costly - too costly for any one nation to carry out on its own, except in the case of the United States which is already developing research along these lines. Thus, with the establishment of the Geneva Centre, other countries, particularly in Europe, will now have a laboratory at which training and study can be undertaken in this important scientific domain.

It should go without saying that all Unesco's work in the scientific field is based on the universality of science - on the fact that science knows no boundaries and that all scientists are eager to share their knowledge with their counterparts in other countries for the benefit of man's conditions. The results of their research and discoveries are the life blood of Unesco's own scientific activities.

For this reason Unesco maintains a world centre of scientific liaison at its headquarters in Paris and regional science offices on five continents. It also strengthens relations between scientists on a worldwide basis by convening conferences and expert meetings and, in particular, by subventions and contracts to the many voluntary scientific organisations which have been created over the past 50 years. One small example will demonstrate the benefits which stem from such financial grants : a few years ago $ 2,000 were given to a society one of whose members was studying plant life in a semi-arid area in California. He found that certain plants - tomatos, squash and spinach - do not need much rainfall but can thrive mainly on dew. As a result of his studies therefore desert regions which have a plentiful supply of dew can put this new knowledge into practice and supplement their food supply.

Finally, it may be mentioned that as the benefits of science are spread to all countries, so there is hope that living standards will be improved : this fact, in its turn, has a market value, since it is known that people with a reasonable standard of living are good customers.

(Unesco Science Bulletin : No. 25)

Reports from the Branches

Annual Report–Poona

The Branch has continued its activities and completed six years of service. The time has come when its activities can be widened considerably and one sphere which offers wide scope for extending our activities is the bringing of science to the masses. In this year, the Branch made a special effort to arrange public meetings on scientific subjects with a view to popularising science. From the response received from the public of Poona we are confident that the Association can effectively achieve its aims.

Membership

The membership of the Branch during the year was 153 as compared to 119 during the previous year. The collection of membership fee has been satisfactory. The distribution of membership is as follows :-

	1953	1954
National Chemical Laboratory:	50	51
Public Health & Public Works	27	39
Meteorological Deptt.	16	17
Kirkee (On pro-rata basis)	25	40
Unattached	1	7
	119	153

General Body & Branch Executive Meetings

A General Body meeting of the Branch was held on 14 2.1954 under the chairmanship of Shri C. R. Mitra to elect the office-bearers for 1954 and to transact other business. The Branch Executive Committee met eight times during the year and the average attendance was more than 50%. Shri Bhagli attended the Central Executive Committee meeting of the ASWI on the 15th & 16th May, 1954 and it proved very useful to the Branch. Shri H. S. N. Murthi attended the Baroda Session of the ASWI held from 2-1-1955 to 6-1-1955.

Activities : (a) General

(i) The annual social gathering was held jointly with the Kirkee Association of Scientific Workers, Ordnance Establishments, on the 24th and 25th April, 1954. There was a variety entertainment and an English play as well as a Marathi play were enacted by the members.

(ii) The Republic Day was observed by the Branch on the 26th January, 1955 at which members pledged themselves anew to the service of our Republic and as a token thereof some members decided to donate their blood to the Blood Bank at Poona.

(b) Popularisation of Science

A public meeting was arranged on May Day at which Dr. N. N. Godbole spoke on "The Role of Scientific Workers in the Five Year Plan".

(ii) Maj. Gen. Sahib Singh Sokhey, President of the Association of Scientific Workers of India, addressed two meetings at Kirkee and Poona on the 15th & 16th April, 1954 on 'The Hydrogen Bomb' at which resolutions urging that the use and experimenting of atom and hydrogen bombs and other weapons of mass destruction be banned.

(iii) Dr. P. R. Pisharoty gave a talk on 'Meteorology in U.S.A.' on the 10th July, 1954.

(iv) Maj. Gen. Sokhey gave a talk on 'The Facilities for Scientific and Technical Training in USSR".

(v) Prof. J. D. Bernal F. R. S. addressed a meeting on 'Science and Planning' on the 25th December, 1954.

In addition to the above, the members of the Executive Committee had informal discussions with Maj. Gen. Sokhey and Prof. Bernal during their visits to the Branch.

(c) Trade Union Activities

1. The Constitution Amendment sub-committee appointed by the General Body considered amendments to rules of the Constitution and their recommendations were adopted with few modifications at a General Body meeting.

2. The Economic Survey Sub Committee appointed by the Executive is carrying out the survey work. To get replies on the questionnaire of the World Federation of Scientific Workers is the main objective.

3. The Sub-Committee on the 'Unemployment of Scientific and Technical personnel' appointed by the Executive submitted a report studying the conditions prevailing in the Ordnance Establishments at Kirkee. The report submitted was adopted by the Executive and it was sent to the Convention on Unemployment held at Calcutta on the 18th and 19th December, 1954.

4. The Executive sent suggestions/recommendations of the Association to the Chairman, 'Administration Improvement Committee' in the Technical Development Establishments (appointed by the Director of Technical Development, Army HQ, New Delhi) in April 1954 on the terms of reference of the same Committee.

5. Collective bargaining in the interests of scientific workers and employees in general in the Ordnance Establishments Kirkee is the main activity of the Association. The Association is confident that the Government is realising the need for the co-operation between the Trade Unions and the Government in the interests of production in the Ordnance Factories. To solve some of the outstanding issues of the Ordnance Scientific Workers at Kirkee, Khamaria and Kanpur, Major General S. S. Sokhey, President of the A. S. W. I. will be leading a deputation to the Minister for Defence Organisation, Government of India.

6. Two seats out of the 6 elected seats of the Technical Development Establishment (Military Explosives), Kirkee are being occupied by the representatives of the Association in the 'Scientific Staff' constituency of the Works Committee. The problems of the scientific staff are being attended to by the two representatives of the Association on the Works Committee.

Units

The Branch is functioning with four units, viz., The Meteorological Unit, the National Chemical Laboratory Unit, the Public Health and Public Works Unit and the Kirkee Association. It is hoped that two more Units at Hindustan Antibiotics Ltd., and the Khadkwasla CWINC stations will start functioning in 1955. Efforts are also being made to form an Association of Scientific Workers in the Malaria Organisation of the Public Health Department of Bombay and get recognition from the Government of Bombay and affiliate the same to the Poona Branch of the Association of Scientific Workers of India. This step has become necessary since ASWI itself has not been recognised. Efforts have also been made through a member of the Branch Executive Committee to form a branch of the ASWI at Baroda.

Kirkee Unit

The Kirkee Unit is the Association of Scientific Workers of the Ordnance Establishments, Kirkee, recognised by the Government of India, drawing its membership from the Ammunition Factory, the High Explosives Factory, the Technical Development Establishment (Ammunition) and the Technical Development Establishment (Military Explosives), Kirkee. The Association is affiliated to the Poona Branch and is functioning as an affiliated Unit unlike the other three which are direct units of the Branch and are not recognised by the Government departments to which they belong.

On the pro-rata subscription paid from the Association to the Branch and according to the terms of affiliation, 40 affiliate members of the Kirkee Association are on the General Body strength of the Branch. The activities of the Association of Scientific Workers, Ordnance Establishments, Kirkee are briefly given below for the year under report :

Membership : During 1954, 49 members were admitted and the membership strength on Dec. 31, 1954 was 283.
Subscription collected during 1954 including Enrolment Fee of Re. 1/- per member
Rs. 833-14-0

Executive Committee Meetings : Twenty meetings were held in 1954.

General Body Meetings : Four were held (dates 14-2-54; 21-2-54; 25-4-54 and 4-7-54.)

Bulletin

The Bulletin Sub-Committee has published 4 bulletins during 1954. The bulletins are regularly sent to all ASWI Branches, allied Associations, distinguished persons, Government authorities, Labour authorities and the World Federation of Scientific Workers. The Branch has so far collected Rs. 27/- towards V. K. Fund.

Finances

The year opened with Rs. 142-8-6. Total receipts for the year (including opening Balance) was Rs. 817-7-9. Closing balance at the end of the year was Rs. 246-5-6.

Hyderabad

A well-attended meeting under the auspices of the Association of Scientific Workers of India, Hyderabad Branch to commemorate the centenary of Carl Friedrich Gauss, the great mathematician of 19th century was held on Friday the 4th March '1955 in Salar Jung hall, Nizam College. Dr. S. Bhagavantam, Vice-Chancellor, Osmania University, presided.

Three papers on the life and work of Gauss and his place in contemporary Science were presented by Dr. B. Visvanathan, Dr. Anisur Rahman and Shrimati Vanaja Iyengar.

Dr. Bhagavantam in his concluding remarks congratulated the ASWI for arranging the centenary meeting of the greatest mathematician so far known and said Gauss was not only known as a Mathematician but also as a Physicist. The Chairman also referred to the unit of gauss magnetism and also to the practice of "degaussing" during World War II for removing the magnetic effect of mines on ships. He also referred to the fact that Gauss never published his results in any journal.

A meeting of the B. E. C. was held on 23rd March' 55, to discuss the formation of Hyderabad Assembly and Scientific Committee and a Sub-committee was formed to contact the leaders of Assembly parties and this Sub Committee was asked to report at the next B. E. C. meeting.

The Branch also arranged two film shows at Y. W. C A. on 19th March and another in C. L. S. I. R. unit on 24th March. The following films kindly lent by U. S. I. S were exhibited.

1. A is for Atom.
2. Atom & Biological Sciences
3. Atom & Agriculture.
4. Atomic Science for Peace.

These were also exhibited in Himayatsagar farm.

LUCKNOW DIARY

Since reporting last under this column, Lucknow has been the venue of four All India Conferences of scientific interest.

The Medical Conference : The 31st session of the All India Medical Conference was held in the last week of December 1951 in the spacious lawns of the K. G. Medical Collge. Apart from the usual inauguration speeches by the State dignitaries, attention may be drawn to the thought provoking welcome address by Dr. B. B. Bhatia and the outspoken presidential address of Dr. S. C. Sen. Referring to the role of the medical profession in the implementation of the Second Five Year Plan, Dr. Bhatia said that the gigantic task of building the health of 360 million ill nourished and disease-ridden people of this vast country would not be achieved without the help and cooperation of every single qualified man or woman engaged in the profession of the healing art. The Chairman gave a lucid account of how with the discovery of antibiotics, cortisone and ACTH and with the ever increasing application of chemical knowledge to the understanding of disease, medicine of today is fast acquiring a new look and urged his fellow-professionals to take greater interest in the broadening horizons of medical science.

In his presidential address, Dr. Sen analysed the cause for the apparent failure of the First Five Year Plan at least with regards to its objective in the field of medicine and health. He called upon the autorities in charge of the plan to look into the disparities existing between the ideals of a paper plan and the practical needs of the country against the background of the available man power and materials. He strongly urged that a definite and irrevocable decision be taken early in favour of modern scientific medicine.

Inaugurating the scientific session of the Conference, Major General S.S. Sokhey declared that socialization of medicine is the only way of achieving the objectives of the Five Year Plan. He wanted Medical Colleges and hospitals to become active centres of research. Till the time our economic level goes up, he preferred the continuance of the state support to indigenous systems of medicine.

State banning by legislation of medical practice by unqualified and uncertified men, banning of the export of the indigenous drug Rawolfina, inclusion of a study of Ayurveda and Unani systems in the syllabus of the M.B.B.S. course were some of the recommendations made by the conference. The scientific session of the conference included seminars on medical education and research and indigenous drugs and symposia on abdominal tuberculosis and cor pulmonale. About 25 scientific papers were presented. There were a few popular lectures including one on Medicine in U. S. S. R, Czechoslovakia and Poland by Dr. S. C. Sen. In addition to this a large number of scientific films were screened. A 2 day exhibition of all pharmaceuticals both locally manufactured and imported was another attractive feature of the conference although one would have liked to see a faster and more methodical progress made by the Indian products. It is also to be regretted that even those indigenous products exhibited represented only botlled or processed preparations made from imported materials.

It is a matter of gratification that the science exhibition organised by the staff and students of the Medical College in connection with the Medical conference, containing an impressive number of charts and models attracted vast crowds of visitors on both the days it was open to the public. There was a general feeling that such exhibitions should be more frequent. The conference was indeed a success but the writer of this column could not help drawing comparisons with the other annual show in India namely, the Indian science Congres and conclude that both are fast outgrowing

their original aims and objectives. Like in the Science Congress of late, reading of original papers and reporting of original clinical cases and data did not receive the attention they should.

Social Workers' Conference : The three day conference of social workers from different parts of the country held contemporaneously with the Medical Conference at the Lucknow University campus concerned itself with the discussion of the formation of a Central Board of Social Welfare and organisational details connected with this. There was very little scientific discussion on the methodology of social sciences and social surveys. It was also strange that very little coordination existed between this conference and the one of medical workers at the medical college.

The Family Planning Conference : This was again the convention type of speech making conference and practically no lead was given in the matter of organisation of rural family planning centres which would appear to be the cry of the day.

The Radiological Congress : The 9th All India Congress of Radiologists was held in the K. G. Medical College on February 10, 1955. 13 scientific papers on various aspects of medical radiology were presented. A popular item was the Jagadish Chandra Bose Memorial Lecture on Curative Radio Therapy.

Visit of distinguished Scientists. Among the other scientific activities in Lucknow during the period under report may be mentioned the visit of Dr. Linus Pauling, Nobel Laureate and a foreign delegate to this year's Science Congress. Dr. Pauling delivered two lectures in the C. D. R. I. Auditorium, one on "Antigen Antibody Reaction" and another on "Haemoglobins in relation to Immunity and disease" and a third lecture at the Lucknow University on the "Structure of Proteins". All these lectures were well attended. Dr. Pauling gave a very lucid account of his theory of protein stucture and how it can be applied in elucidating problems of immunity.

We should also mention the visit of a team of medical experts headed by Dr. Rosenheim sponsored by the Indian and British Medical Associations and the Colombo plan. The story of these experts in the K. G. Medical College and the discussions they had with research workers in C. D. R. I. and the Medical College were very fruitful indeed.

The Railway Researeh Centre : The open house conducted by the Railway Research Centre at Alambagh to comemmorate the first anniversary of its opening attracted a large number of visitors. The exhibition included a number of charts in various railway transport problems as well as working models of strain testers and other costly equipment used in mechanical research.

The Action and Planning Research Institute : An interesting controversy has been going on in the last few days in the columns of the local dailies about the alleged interests of American-sponsored agencies in affairs of the Action and Planning Research Institute set up recently by the Uttar Pradesh Government for the study of the social implications of development projects. The controversy is mostly on the methodology adopted by the Institute for the preparation of questionnaire for social surveys on the effect of the Five Year Plan. We are trying to collect all the data on this interesting and vital topic for an objective 'scoop' in one of the later issues of this journal.

Exhibition on Five Year Plan : The results and progress of the first Five Year Plan projects in operation in Uttar Pradesh are being exhibited as models in the local Banarasibagh gardens. This exhibition aims to educate the people about the potentialities of the multi-purpose projects launched under governmental auspices. Although this exhibition has attracted crowds of educated and uneducated visitors one cannot escape the thought that it has failed to impress the people. Now that the Government is thinking of making this exhibition a permanent one, it is time they take into consideration the reasons for the lack of enthusiasm of the common man in such ventures of the government.

THE BANGALORE DIARY

The Bangalore branch of the Association of Scientific Workers of India, held their annual meeting wherein new office-bearers were elected. The election and attendant matters will be communicated by the branch secretary separately. There were several interesting meetings during this month. Dr. H. Koppers of Messers Koppers Limited, Germany, gave a talk in the Chemical Engineering Association on "Recent Developments of Coal dust gasification". After the lecture which was illustrated with graphs and flow-sheets, there was an informal discussion when several points were elaborated. In another technical meeting of the British Institution of Radio Engineers, there was a lecture on "Underwater Sound and Some of its Applications" by a former President of the Bangalore branch of the Association of Scientific Workers of India, Dr. B. S. Ramakrishna. In this review, the principles underlying the design of electro-accoustic transducers for underwater sound and the techniques used in echo ranging and their application to sound navigation and sound fixing were dealt with. In metallurgical seminar there was a discussion on the thermodynamic behaviour of sulphur in liquid iron and the influence of silicon on the activity of sulphur in iron. In another meeting under the same auspices, the interesting properties of a mica-like mineral called vermiculite were discussed together with the work on the upgrading of low grade deposits from Mysore State. It might be remarked that vermiculite expands considerably on heating and is an excellent thermal and electrical insulating material. Though this material is used extensively in industry in America and other countries, it has not found any application yet in this country. Before embarking on the utilisation of this material in various industries, it is necessary to evaluate the quality and quantity of existing resources in India. It has been found that because the material is always encountered in very low quality, it is necessary to upgrade it by suitable techniques. It has emerged from this work that vermiculite from Mysore, after treatment may be utilised in electrical and thermal insulation work in India. The classification and application of electric insulating materials were dealt with in another session held under the joint auspices of the Associated Electrical Industries (India) Ltd., and the Power Engineering Department of the Institute of Science. Mr. J. K. Clarke of Micanite Insulators Company Limited, London, spoke on the important characteristics and properties of micanite. It is perhaps, astonishing that the raw materials for micanite, mica and shellac are mainly exported from India and manufactured into micanite in England. It is high time that in view of the enormous resource of waste mica in India an insulating industry which can utilise the waste mica and make it into useful insulating material is called for. It was reported in the press sometime back that the Government of India, have a committee on the mica industry with special reference to export of block and waste mica. The Mechanical Engineering Society at the Institute, has cast off its old name with the adoption of a new constitution and has styled itself as the Engineering Society of the Institute of Science, to make itself more broad based. The society has decided to launch its official organ in the new academic year and this columnist has been entrusted with the task of bringing out the new journal. It might perhaps be concluded that there was also a talk on "The Influence of Phosphates on Nitrogen Transformation" delivered under the auspices of the Society of Biological Chemists of India, which body, incidentally, is due to celebrate its Silver Jubilee early next month. Professor Marcus Oliphant, is scheduled to gave a talk here and the scientific workers and the citizens are looking forward eagerly to the lecture where the atom is to figure prominently.

Bangalore 3.
27.3.1955

N. R. SRINIVASAN.

OBITUARY

Shri P. N. Srivastava

We regret to report that under tragic circumstances Shri Prem Narain Srivastava, Lecturer at the Birbal Sahni Institute of Palaeobotany, passed away on the afterenoon of 16th February 1955, at a premature age of 27. The jeep in which he was returning after making a valuable collection of fossil plants from the coal-field of Bihar and Raniganj overturned near Handia on the Allahabad-Banaras Road. He unfortunately succumbed to the severe head injuries that he received, within an hour of the accident. He leaves behind him his wife and a 2½-year old son.

Mr. Srivastava was born at Lucknow on 10th October 1927 where he spent practically the whole of his short span of life. He was the first scholar to join the Birbal Sahni Institute of Palaeobotany as a U. P. S. R. Research Scholar in July 1949. His chief contribution to the science of Palaeobotany is his detailed work on the cuticular structure of the Glossopteris Flora which will soon be published. He had recently submitted a thesis entitled "Further Contributions to the Glossopteris Flora of India", for the award of Ph. D. degree at the University of Lucknow. His other, but none the less valuable, contributions are (1) The determination of the age of the Vindhyans, (2) Microfossils from some Lower Gondwana Coal Seams of West Bokaro, Bihar and (3) Some additional knowledge to the Lower Gondwana Flora of Bihar. He was a research worker of a high calibre and it is not surprising that in such a short time he had achieved so much. He was also an active member of the ASWI.

In his untimely death the science of Palaeobotany in general and Birbal Sahni Institue of Palaeobotany in particular has lost an ardent and tireless worker and the Association a valuable member.

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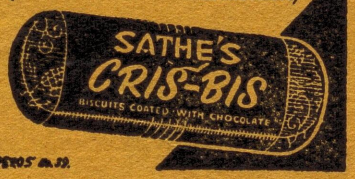

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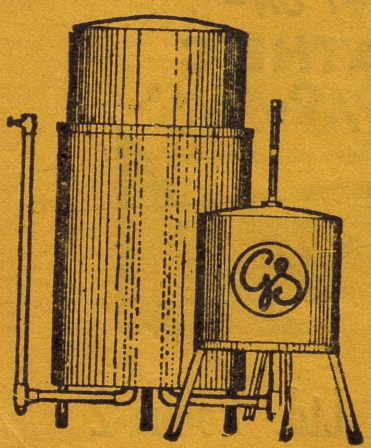

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