

# VIJNAN-KARMEE

official organ of the  
ASSOCIATION OF SCIENTIFIC WORKERS OF INDIA

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No. 4 September 1949

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### VIJNAN-KARMEE

Popular articles on scientific and technological subjects and on the social and economic problems of scientific workers are invited for publication in Vijnan-Karmee.

It is proposed to start a forum in Vijnan-Karmee for discussion of various important issues facing the scientific workers and the society. Communications in this respect may be sent by individuals or groups.

Letters to the Editor from the scientific public in general and members of the Association in particular will be published. Assumed names may be accepted but the authors must give their full names and addresses and the letters must be signed by them. The editors as well as the Association will not be responsible for the views expressed in the communications.

The editors reserve the right of accepting or rejecting a communication for publication as well as to make minor alterations, if necessary, before publishing the articles, letters etc. Articles, letters etc. not selected for publication can be returned only if postage stamps are enclosed.

Communications should be addressed to the General Secretary, Association of Scientific Workers of India, University Buildings, Delhi 2.

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# VIJNAN-KARMEE

No. 4 SEPTEMBER 1949

## POLITICS AND SCIENTIFIC WORKERS' MOVEMENT

In a world beset with different ideologies and almost in a flux as at the present day, it is inevitable that all aspects of life, including scientific, would impinge in some way or other on politics. We know that social and political conditions can cause frustration of science. The international embargo on the exchange of scientific information on atomic energy is an instance in point. It is clear that science can come into its own only when extraneous forces do not fetter or pervert science, when all the nations of the world become one human community and the inequalities which cause so many stresses and strains disappear from society.

Different bodies of people think differently about the ways in which the aforesaid consummation can be brought about. They honestly differ. Some think of violence and some of non-violence. Some think that one must inevitably pass through a period of regimentation. Some others consider on the other hand that democratic methods should function and prevail more than now, that whatever smacks of the straight-jacket of the mind should be removed, that we should proceed towards more and more democratic decentralisation and so on. Among scientific workers also there can be different groups with different social and political ideologies. We are of course ignoring those groups who have the conscious motive of exploiting others and perpetuating a *status quo* for profit and power. We are only considering those who have *honest* differences

of opinion about the methods of progress and even the objectives of progress.

It appears to us desirable that in order to strengthen the scientific workers' movement in India which has only just started, groups of scientific workers holding different social and political ideologies but agreeing on the basic aims of this movement *viz.*, the application of science to social welfare and the amelioration of the condition of the scientific workers of India, should not clash but unite. If any political group wishes to "capture" the Association of Scientific Workers of India, at the present incipient stage, it will fail to be the broadest platform of all sections of scientific workers in this country. Unfortunately there are political groups in this country which often wish to capture every conceivable platform for their own political propaganda and this, in our view, should be resisted.

From the Calcutta Letter appearing elsewhere in this issue it would be clear that certain political groups are making attempts to raise a number of misleading slogans in order to create disruption in the scientific workers' movement in this country. It appears that the political group to which these persons belong is really wanting to have a privileged position for its own followers. Whether they are competent or not, honest or not, they apparently claim to get scholarships and all the facilities of a research laboratory. Even scientific workers must have a certain level of morality, a certain standard of efficiency and a certain spirit of co-operation

to be useful members of a research laboratory. It is unfortunate that the relations between the research guide and the research workers and the calmness of the atmosphere of the research laboratory should be vitiated by such politically inspired propaganda.

For the strength and purity of the scientific workers' movement it is necessary that such persons as try to introduce false issues and create bad blood among scientific workers should be isolated. The movement will get weak if spurious scientific elements which have got their loyalty elsewhere are allowed to sow seeds of discord and disruption in the movement. While there must be constant vigilance to see that scientific workers irrespective of

their ideology and irrespective of their political differences with the powers-that-be are allowed to carry on their work without let or hindrance, the other extreme of encouraging license in science at the instigation of political groups should be stoutly resisted right from the start. The Association of Scientific Workers of India should be an organisation of all the sections of scientific workers whatever their political views, provided they agree on the common objectives of the Association. But no group can make special claim that because of a special political ideology it should be immune from the requirements of discipline in a laboratory and from all the ordinary moral standards and decencies of life and conduct.

## SCIENCE IN THE MODERN WORLD

*Speeches delivered at the public meeting in the Lucerna Hall, Prague, on September 22, 1948 on the occasion of the First Assembly of the World Federation of Scientific Workers.*

### Prof. F. Joliot-Curie.

As President of the World Federation of Scientific Workers I would like to tell you how much all our colleagues have been touched by the welcome they have received at Prague. They have come here with a full knowledge of the moral qualities of the citizens of this country, and with a memory of your martyrdom during the occupation and your heroic fight against the enemy, and your prodigious effort of reconstruction.

Allow me to thank especially your President of the Republic, M. Klement Gottwald, your Minister of Education, M. Zdenek Nejedly and your Minister of Information, M. Vaclav Kopecky, not only for permitting our General Assembly to be held in Czechoslovakia, but also for giving us such cordial hospitality.

I shall express to you incompletely our state of mind if I did not tell you how profoundly we feel the cruel grief which has so recently afflicted your country.

For all men of freedom and progress, and specially for the scientists, for whom the veneration of truth is, if I may dare to express it thus, a professional habit, the figure of Eduard Benes was, and will remain, a symbol. On the 7th August, 1945, while delivering his discourse after receiving his degree as doctor *honoris causa* of the Charles University of Prague, he said with regard to the times in which we live - "This epoch will constitute a special chapter in the history of Europe, and of the world, a great chapter inspired by the revolutionary spirit, which will rank amongst the most tempestuous periods in the world. It will be called an epoch of transition, of crisis, and of the foundation of a new phase in the history of human society, accompanied by crises, wars and great sufferings ; or at least of attempts to create a new phase....."

So the great statesman who recently passed away, expressed himself. In this period of

transition, crisis and organisation, it is certain that science plays, and will continue to play, a major part. Are not the profound changes in thought and living conditions the direct consequence of the intense development of scientific knowledge, and its technical applications? Science, with an ever accelerating rhythm, has extended our knowledge of the world and our control over the forces of nature. It would be ridiculous to deny the benefit that science has already brought to mankind, but the misapplications of science, which I call the deviations of science, are the cause of many of the serious crises in modern society. The responsibility for these misapplications or deviations rests on the individualists, who, during centuries, have constructed their ideal on the notion of private property, on a type of man whose activity is ultimately directed only towards himself, whether in intellectual work or in social life, and who aspires to possess things, and make use of other people for his own profit. Unappreciated by the majority of men, science and technique continuously created social problems and very few thought of applying scientific methods for their solution; and while certain groups in certain social classes sought to direct this evolution of society to their own personal profit and the maintenance of their privileges, others, who are now numerous and strong, conscious of this continuing revolution, understand that a new attitude and a new mentality has become necessary.

A century ago, Karl Marx created what we may call scientific rationalism, in order to understand and solve the social contradictions which became ever more apparent and more cruel.

Science repudiates individualism and has given birth to the new type of man, to whom the notion of self is the result of the coordination of all individual effort.

The working session which we have held at the General Assembly of the World Federation of Scientific Workers, and the atmosphere of to-night's meeting, make one understand better

the Universality of science and all the civilisation owes to it.

More perhaps than any other human activity, science gives us confidence in man and makes us love him. It is, and this is one of its highest claims, a fundamental element of unity and of harmony in the thought of men throughout the world.

The World Federation of Scientific Workers, under whose auspices we are meeting here to-night, is a young organism, having been founded in London two years ago. The men whom it unites are convinced that it is in the application of scientific rationalism that the successful solution of the difficult problems of our life can be found. They do not want to be the accomplices of those who are permitted by an evil social system to exploit the results of scientific work for selfish and mischievous ends. They refuse to regard themselves as an elite detached from the ordinary affairs of life, and they offer their cooperation as citizens, as members of the great community of workers, to all those who struggle for a full utilisation of science for peaceful purposes, and the well-being of mankind.

It is not surprising that this sentiment should have been expressed to us in the fraternal message which has been sent to us by M. Louis Saillant from the world Federation of Trade Unions "... More than ever, intellectual and manual workers fight side by side to eliminate the dangers of war and to found the conditions for a stable peace by a more coherent and rational organisation of the world. We must, therefore, study together solutions that can be brought to bear, in the interests of peace, on problems such as the applications of science with a view to the raising of the standards of life of the peoples, the reconstruction of the devastated areas, the development of the colonial and backward regions, industrialisation, the utilisation of atomic energy, questions of housings, the influence of trusts and monopolies on the progress of technique and inventions, etc...."

All this shows how heavy are the social

responsibilities of scientists. Growing in number, they are acquiring a sense of these responsibilities, and it is one of the merits of the associations and unions grouped in our young Federation to have contributed to the creation of this understanding.

In a society where science is fully and properly utilised, the position of the scientist is far from being diminished. On the contrary, it is reinforced, thanks to the powerful means which the whole of society can put at his disposal, to increase the patrimony of human knowledge.

Do not these open for us from now on marvellous perspectives?

The majority of human beings is haunted by the fear of famine, and to a lesser degree, by the lack of utilisable energy. Now science can already define the conditions for an agriculture with a very high yield; a yield so high that a portion only of the soil cultivated today would produce sufficient food for all. The remaining portion could then be used for the cultivation of other plants, thus synthesising by the aid of solar energy supplies of precious raw materials. A new industry would be created, transforming these materials with the aid of ferments and micro-organisms into highly utilisable products. The cultivable soil will then become a mine of continuously renewable resources.

Life requires energy as well as material. The water of the oceans, evaporated by the sun's rays, falls back on the earth and provides us with the driving power for hydro-electric installations. These marvellous machines transform the sun's energy into electrical energy turning it to account without exhausting the resources accumulated during thousands of years in the earth's crust.

In the same spirit, and with the certainty of success, we must tackle the utilisation of the heat energy in the seas, and the energy in the tides and the wind.

Certainly, the liberation of the energy of uranium and thorium has legitimately given birth to great hopes, which will not be disappointed.

However, this new source of energy depends upon a raw material extracted from mines which will one day be exhausted. I think it will be artificial radio elements, which are mass-produced in the uranium piles, that will enable us to learn how to make substances such as chlorophyll of plants. We will then be able, thanks to solar energy, to recover the precious carbon, which, extracted from the mines in the form of coal is degraded into carbon-dioxide by burning in fires and boilers.

To be complete, I should have to mention all the chapters of science and its applications. I have neither the time nor the competence to do so, but I forecast that our horizon is more dazzling than any hitherto predicted, and the scientist and engineer can pursue their work with confidence. It is not a question of promises in another world: these promises are for this one.

#### **Prof. J. D. Bernal :**

I would like to add my thanks to those of Prof. Joliot-Curie for the reception we have had in your country and particularly to the Czechoslovak Association of Scientific Workers for the work they have done in organising this Congress and the ideal conditions in which it has been held.

You have heard from Prof. Joliot-Curie of the great perspectives that lie before humanity and the task these impose on the scientific worker. I should like to underline his remarks with the more immediate prospects and difficulties of science in the world today. The profound revolution in man's attitude towards his environment is one in which he is moving to a total and conscious control of the forces of nature and of the organisation of this society. We are at the moment in a critical phase of this revolution and in the last few years scientific workers have begun to realise they have responsibilities which go far beyond those assumed in the past. They can no longer be indifferent to the consequences of their discoveries but must concern themselves with the direction

of their own work and of its effects on society. This indeed is the reason for the existence of the Associations of Scientific Workers and of the World Federation of Scientific Workers. It finds expression in the Charter for Scientific Workers which has been accepted today by our Assembly. This Charter lays down the duties of scientific workers as well as the conditions under which they can best work for their communities and for the world.

I would like to speak in particular of the work which can be done for the immediate improvement of the conditions of life and labour, of the new contribution that science can make to industry and social organisation. The experience of the war has shown that research and development can extend far beyond the range of the new industries—those of chemistry and electricity—and indeed transform the older and traditional industries in such fields as metallurgy, engineering, textiles and the food industries. Everywhere in the world the question of productivity has become absolutely vital. We have to suffer from the relics of capitalist economy which lead to the inefficient use of materials and their waste on a large scale. Thus about 80 per cent. of the energy derived from coal is lost in industrial processes and almost twice as much steel is used than is really necessary. It is through scientific study and its application in engineering practice that these difficulties can be overcome. It is not only that the knowledge of the materials and the technical problems of the industry will lead to an improvement in both but that the whole organisation of the work in the industry can be simplified and accelerated by a study of the industrial operations using modern statistical methods. This is only possible if the industry is really directed both for the benefit of community through its products and for the improvement of the conditions of work and life of the workers in the industry itself. The enormous liberation which occurs when the workers control their own industry makes it possible for

the first time to apply scientific method in full cooperation with them and to achieve results, such as those already achieved in the Soviet Union and the new democracies, impossible under the system of capitalism. It is this alliance between the scientific and manual workers that is the keynote of the organisation of our individual associations and of the World Federation of Scientific Workers.

I would like to give one example of what can be done in a practical way both nationally and internationally in the vital field of housing. The building industry in Britain has until very recently been a most backward industry, carried out by old traditional methods without machinery and organised in a confused way and in many very small enterprises. In Britain as a result of the destruction of the war an attempt was made to apply science to the improvement in housing and a coherent scientific plan of housing development was initiated and is now being carried out. This plan includes a study of the physical and social needs of the people so as to modify the plans of the houses and their services such as heating and water. This is being done by the building of a large number of experimental houses where different arrangements can be compared in actual occupation. An investigation of uses of new and improved materials for houses, finding substitutes for increasingly expensive brick, wood and steel, and using all materials more economically, is being pursued. Numerous trials with prefabricated houses had been undertaken to cut down the time of building and to make use of the experience of factory production. Finally the old traditional methods have been re-examined with the idea of mechanising them and removing the particularly hard and laborious work of the traditional building worker. All this is being done in close co-operation with the building unions themselves. This scheme of research in itself admirable, suffers, however, from a fatal defect in its application. Much has been learnt but because of a reluctance to

interfere with private interest little use has been made of this knowledge.

Associations of Scientific Workers have an immediate task in urging and securing such applications of science in their own countries. It is their responsibility to study the problems of their own countries in order to find those that are the most capable of being solved by scientific methods. At the same time they must explain this to the people, their trade unions and their governments in order to secure that the greatest use is being made of science and, finally, they must be prepared to assist in the carrying out of such researches and applications of science.

This does not mean that fundamental science should be neglected. Indeed a fuller understanding of the social functions of science implies the need to foster and increase the store of underlying knowledge and to secure its maintenance through adequate and planned financial provision, which has in the past often depended on the caprice of individuals.

What can be done in each country gains its full value only if it is combined with the work of other countries. Although the experiences and needs of different countries vary enormously in dealing with their separate problems scientists are bound to arrive at solutions of value to those in other countries.

The ordinary mechanisms of scientific communications already seriously disturbed by the restrictions of commercial and state secrecy are not sufficient. We need a positive drive for effective inter-communication and common planning of research on an international basis. Some beginning of this has been made in the field of housing by the European Economic Commission where the comparison of different housing matters in various countries of Europe have already shown what economies are possible by the common adoption of methods that are found to be best. They have also brought together the research institutes throughout Europe with the idea of dividing the common

problems and allocating them to those best equipped to solve them. On the initiative of the Soviet Union, the European Economic Commission is now being urged to apply the same principle to industrial processes in general with the particular aim of assisting in the rapid development of the devastated and industrially backward countries of Europe.\* If such a scheme could be carried out effectively it would go a long way to removing one of the main dangers of our civilisation which arises from the very unequal development of industry in the different countries by raising all countries to the highest level.

We are, however, becoming more and more aware that this peaceful progress is being deliberately blocked by forces tending towards economic domination and war. Already, particularly in the United States of America and Great Britain, science is being turned more and more to war uses. Governments spend several times as much on military as on civil science and the methods of secrecy and political determination are being used to dominate the whole of science and direct it towards exploitation and destruction. War is not only the negation of science and humanity, it is a policy which solves none of the problems that give rise to it. The proof of this is ever more rapid recurrence of wars in the last hundred years as the crisis of capitalism passed into its final collapse. The workings of capitalist economies ensure that the advances of technique do not pass to the people but are used to give even greater scope to the making of profits. At the same time it is also leading to the effective enslavement of whole populations directly in the colonial countries and indirectly wherever local industry can be wiped out of existence by the importation of goods exported at low prices or presented under such schemes as the Marshall plan. In particular as already shown by the reports of the European Economic Commission the real need

\* The proposal has since been turned down at the instance of the USA and British Governments.

of Europe is for an increased industrialisation of the eastern European countries and for a substitution of trade with them for a trade with the western hemisphere. Science is vitally affected by the Marshall Plan in any country which accepts it. National industry is restricted to what are effectively branch factories of American firms, where the technical knowledge is itself imported, and to what is left of traditional industries. The defence of national

economic independence is at the same time the defence of scientific and cultural independence. The special value of the World Federation of Scientific Workers is that it combines the deep respect for national cultural independence with the possibility of the fullest international cooperation. It is the expression of the unity of science not simply of academic bodies of thought but as a unity in action for reconstruction and peace.

## SCIENTIFIC WORKERS' MOVEMENT IN MAHARASHTRA.

By

V. R. JOSHI

*Secretary, Association of Scientific Workers, Ordnance Establishments, Kirkee.*

It was an Englishman, Mr. M. D. Owen, the then Assistant Inspector of Military Explosives, Kirkee, who sometime in 1945 started negotiations with the British Association of Scientific Workers and the Government of India with a view to enlisting scientific workers in the Ordnance Establishments at Kirkee as members of that Association and obtaining Government's permission for the enlistment. Though the constitution of the British Association did not preclude overseas membership, the Government of India refused to give permission for the scientific workers in the Ordnance Establishments to join a foreign trade union. The Government, however, permitted in 1946, the civilian employees under the Ministry of Defence to form their own trade unions.

Three Associations of Scientific Workers in the Ordnance Establishments of India came into being at Ishapore, Kanpur and Kirkee within a short space of time. Mention must be made of Mr. W. D. Patwardhan, an officer of the Inspectorate of Military Explosives, Kirkee, who took the initiative in giving the first push to the movement at Kirkee in 1947. The original idea was to have one organisation only catering for the scientific workers from all the Ordnance

Establishments in India ; but due to practical difficulties encountered during working, it was thought advantageous to have separate organisations at the various Ordnance centres initially and then to come together later and to federate if possible.

While these negotiations were being carried on by the three sister associations among themselves, the all-India body i. e. Association of Scientific Workers of India had already been formed. The Government of India in the Ministry of Defence suggested at this juncture that in the interest of unity of scientific workers and for the purpose of coordination of work it would be highly desirable if the three associations were affiliated to the Association of Scientific Workers of India.

During the first year of existence, the Association at Kirkee had merely to mark time till it could be registered as a trade union. After registration, which came about sometime in August, 1948 at the end of the first year, the real work of the Association began. Membership, which was then round about fifty, rose steeply three times at the end of the second year and had overstepped the two hundred mark at the beginning of the third year, now in progress.

The frustration keenly felt by the scientific workers from the lower cadres as a result of irregularities of service conditions, the low start of pay that was then given to Ordnance chemists while recruiting, and the neglect of qualified scientific workers in general by certain authorities served as a binding force. The bulk of the membership is drawn from the Inspectorate of Military Explosives and it stands today in the vicinity of hundred. Ammunition Factory supplies about fifty members. About twenty-five members are drawn from each of the Technical Development Establishment (Ammunition) and the High Explosives Factory.

The first contact with the ASWI was made when its Bombay representatives visited Poona and addressed the members of the General Body of the Association. This was a prelude to affiliation and matters took concrete shape very soon. The General Secretary came down to Poona at the invitation of the Association in April, 1949 and set the seal of ASWI on the affiliation of the Association with that august body. The affiliation gave a big momentum to the work of the Association in general and the membership in particular. The affiliation also proved to be a prelude to the formation of Poona Branch of the ASWI. The background for the formation of the Branch was already prepared by the Association and the presence of the General Secretary precipitated the initiation of the Branch. The Association as an affiliated body works as a Unit of the Poona Branch. Affiliation has given a sense of solidarity and a sense of faith in the bigger cause of the scientific workers of India. It has also created a sense of security as we no more feel that we are alone and that in case of distress we can give a call to our comrades at the Headquarters of the ASWI at Delhi.

The Poona Branch, during its short life, of

about four months, has built itself up successfully. Besides the Association which, as has already been mentioned earlier, works as a Unit of the Branch, there are three other constituent Units of the Branch in existence and two more in the formative stage. Those in existence are : (1) National Chemical Laboratory Unit, (2) Public Health and Public Works Unit, (3) Agricultural College Unit. Those in the formative stage are in the Meteorological office and in the Central Waterways, Irrigation and Navigation Research Station.

The movement is new to India and as proverbially prejudices diehard, we are facing opposition from some of the so-called elder scientific workers and certain authorities bred in the old autocratic school of thought for whom trade unionism of scientific workers is a sacrilege of science. In spite of all the opposition, minor or major, the movement has already taken deep roots in Maharashtra and instances are not wanting to show that elder and senior scientific workers are coming forward voluntarily to enlist.

Members of the Association who have been transferred permanently on duty to places like Aravankadu (Nilgiris) and Khamaria (Jubbelpore), have formed nuclei at those centres and it will not be long before that affiliated bodies of the ASWI are formed at those Ordnance centres. Our sister Associations both at Ishapore and Kanpur are already thinking of coming on the common platform of the ASWI. Scientific Workers from Dehra Dun have already come in.

The forthcoming session of the Indian Science Congress which is to be held at Poona and alongside of which the General Body of the ASWI is to meet, shall definitely give a big push to the movement in Maharashtra. Whatever little opposition still lingers will then melt away like snow before the rising sun.

### Calcutta Letter

*(From our Correspondent)*

In a meeting of the Calcutta Branch of the Association of Scientific Workers of India held on the 13th August, 1949 a speech was delivered by Dr. B. C. Guha on "Freedom in Science", which was followed by a discussion. Dr. Guha spoke as follows :

The problem of freedom in science has become a world problem. Internationally the restriction on the dissemination of scientific knowledge, particularly relating to atomic energy, is materially impeding the progress of science. This is of course related to the international situation in which there is a fear of war. Since the atomic bomb appears to be the most powerful weapon at present known for causing destruction on a wide scale, it is natural, though unfortunate, that there will be a tendency to restrict the transmission of information on the researches on atomic energy, which is directly or indirectly related to the use of that energy for purposes of destruction. On the other hand it is clear that if exchange of information on atomic energy were completely free and international collaboration on this subject on the widest scale had been promoted, there would be a very good reason for expecting the use of atomic energy for promoting the welfare of mankind within a relatively short period. It is also to be recognised that fear and the consequent activity for developing destructive weapons constitute a vicious circle and unless this circle is broken, the future of humanity is dark. In fact, the existence of these weapons itself might help the world to gravitate to a new war, which could quite conceivably mean the end of a lot of the achievements of modern civilisation. Scientific workers owe a special moral responsibility in this regard, as they are directly concerned with all these researches which might some day be used for anti-social and destructive purposes. It is their duty, therefore, to promote a world-wide and vigorous movement for peace and for the abolition of weapons

based on atomic energy and for that matter all other weapons meant for mass-killing. War should not be considered inevitable simply because there are countries with different ideologies and co-operation between such countries in various spheres is eminently possible and desirable. A movement for peace and international co-operation will help the enlargement of the area of co-operation and gradually remove the fear of war from the minds of men which is doing such incalculable harm at the present day to the progress of mankind. Restriction on the transmission of scientific knowledge is a very disquieting feature of present times and it is a matter of great regret that the world should be receding from that unhampered freedom in science which has been the most important factor for the phenomenal progress of science during the last century.

In certain countries science is restricted in a different manner. A particular government which happens to be in power can and does often persecute scientific people for merely holding political and social views other than those held by that government. In Greece, for instance, wide-spread complaints have been made that scientists, teachers, lawyers and many others have been debarred from following their particular avocations simply because their views were more liberal than those of the Greek Government. We know also of course of the suppression of scientific freedom in Nazi Germany and Fascist Italy. This is a serious situation as this would mean that scientific workers are not free to hold their own political opinions but must conform to the political beliefs held by the Government in power. In a democracy, Government in power can always change and it would be a bad day for science if scientists can be appointed or dismissed according to the political complexion of the Government that comes in to power.

On the other hand freedom in science must be distinguished from license in science. Of late there have been accusations in India that

scientific workers are being victimised because of their political opinions. In a leaflet issued recently in Calcutta, for instance, it is alleged that Dr. B. C. Guha has victimised certain research workers for their holding political views different from his own. Since the leaflet is issued in the name of "some scientific workers" it is necessary to reply to these charges in the interest of the purity of the scientific workers' movement in this country.

Dr. Guha said that the falsity of the statement was proved by the very fact that even now he has got in his laboratory research scholars who share the same political ideology as the persons who have been referred to as victimised persons in the leaflet. Obviously therefore those who are mentioned in the leaflet could not have been treated as they were, merely on the grounds of political ideology.

Nonetheless it was useful to examine the complaints in the cases mentioned. One of the research workers was a person who was drawing a scholarship in Dr. Guha's Department during his absence from Calcutta and he continued to do so even after Dr. Guha rejoined his Department coming back from Delhi, contrary to the allegation that Dr. Guha turned him out after his return to Calcutta. The fact was that he voluntarily left the Department for doing work abroad. Dr. Guha explained further how improperly he behaved both to Dr. Guha and Prof. A. Szent Gyorgyi in regard to the arrangements for his work abroad. The conduct he had shown in this connection was unheard-of in scientific circles.

Another person referred to in the leaflet is a person who in course of three or four years did practically no work and was exceedingly inefficient. Nonetheless he was not removed from his scholarship. It was only when his scholarship ended and a new scheme came to the Department for which he was not taken as a scholar that he made the grievance that he was not taken on political grounds.

Another person referred to in the leaflet was

one about whom it was stated that facilities for work were first offered and then withdrawn. He was interviewed by Dr. Guha at length on the second occasion and was found so unsatisfactory that Dr. Guha could not recommend him. His type is indicated by the fact that he has recently been expelled from another laboratory on the charge of his attempting to assault two workers of that laboratory.

There is a mention of another person about whom it is stated that he was not given a Ghosh Scholarship because Dr. Guha who had then left the Department, had asked the Head of the Department not to appoint him. Dr. Guha said that he knew nothing of this scholarship and he had no occasion to speak to the Head of the Department about any person's appointment to the post in question and even to this day did not know who was appointed as the Ghosh scholar.

Dr. Guha pointed out that no scientific worker should claim scholarship or other facilities of work merely because he held a particular political ideology, nor could such a person because of his political views claim immunity from observing a legitimate moral standard and common decencies in life. If a research scholar is dishonest, perpetually negligent to his work or tries to assault other members of the laboratory he surely cannot claim a place in the laboratory in the name of freedom in science, merely because he belongs to a certain political school. If Heads of laboratories had to submit to the demand that the people of the type referred to must be given scholarships and facilities for work in a laboratory, otherwise they would raise the cry that they were being victimised for their political opinions, it would amount to submission to blackmail. Not to speak of promoting freedom in science it would merely be promoting license in science, and would poison the atmosphere in a research laboratory spoiling the relation between the teacher and the taught, between the research guide and research worker and would give an enormous setback to our

scientific progress. Dr. Guha said that scientific workers generally should deprecate such false low-level propaganda as has been done in the aforesaid leaflet, and try to isolate these people whose activities were so baneful to the placid atmosphere of a laboratory and to scientific progress. He asked scientific workers to be very vigilant. They should guard on the one hand

that people in political power do not interfere with the freedom and progress of science and on the other that political elements in the country do not misuse the concept of freedom in science by spreading falsehoods and promoting unfriendly relations between the teacher and the taught and among the scientific workers generally.

## OURSELVES

A meeting of the Central Executive Committee of the Association was held on the 22nd July, 1949 in New Delhi. The following were present : Dr. B. C. Guha (in the chair), Mr. Bharat Bhushan, Mr. M. Chakravarti, Mr. P. M. Bhargava, Mr. A. C. De, Dr. D.V. Karmarkar, Mr. S. Bhattacharji, Dr. P. K. Kichlu and Mr. C. R. Mitra.

The CEC approved of the formation of the Poona Branch and ratified the terms of affiliation agreed upon by the General Secretary and the Association of Scientific Workers, Ordnance Establishments, Kirkee.

The financial position in regard to the publication of Vijnan-Karmee was discussed and the CEC urged upon the Branches to raise donations and to organise sale of Vijnan-Karmee and it further urged upon the members to endeavour to sell at least two copies of Vijnan-Karmee to build up the publication fund.

Mr. I. K. Kacker had been elected to the Editorial Advisory Board of Vijnan-Karmee in place of Dr. B. Sanjiva Rao who expressed his inability to serve in the Board.

In consideration of the report of the General Secretary in regard to a letter from the Tata Chemicals Kamgar Sangh, the CEC viewed with deep concern the situation in the industry resulting in the retrenchment of 1500 workers and cessation of production of 90 tons of soda ash per day and urged upon the Government to

look into the matter.



A symposium on "Food and Population" was held under the joint auspices of the Calcutta Branch of the ASWI and the Royal Asiatic Society of Bengal on the 15th of July. Dr. B. C. Guha opened the symposium and a number of eminent scientists and social workers took part in the discussion.



The Poona Branch of the ASWI has organised classes on German and French languages. The classes are conducted regularly and attendance of scientific workers is encouraging.



The Delhi Branch of the ASWI organised in recent months a number of popular science film shows as well as two popular scientific talks one on 'Food and People' by Dr. B. C. Guha and the other on 'Science and Scientists in America' by Mr. John M. Steeves.

The Delhi Branch is progressively gaining in strength and recently two more Units have been organised—one in the Delhi Cloth Mills (Textiles) and the other in the Indian Agricultural Research Institute.

Recently two active Executive Members of the Branch, Mr. I. K. Kacker and Mr. S. K. Mohindra, have left Delhi with professional appointments at Hyderabad and Bihar respectively.

## NOTES AND NEWS

### Adoption of scientific terminology in Indian Languages

The Council of the National Institute of Sciences in India at its meeting held in the first week of August, 1949 discussed the question of the possibility of carrying on advanced scientific teaching and research in an Indian language and the script in which it could be done, and submitted to the Government of India the following proposals:

1. It is considered possible to give instructions upto the under-graduate level in any provincial or National language, but it is desirable to leave latitude and allow flexibility in this matter so that each institution can develop a practice which best serves the need of the locality and the community.

2. At the post-graduate stage the medium of instruction could be any language agreed upon by the teacher and the students.

3. It is desirable that attempts should be made to uniformise Indian scripts as far as possible so as to reduce the difference between the languages of the same linguistic group.

4. For the advanced scientific journals published by learned societies, publications should be not only permitted in the National language but also in any of the major provincial languages and English.

5. International scientific terms should always be used except where there are in any particular Indian language, well established words in common use whose meaning is unambiguous. The Council does not favour the attempt to invent new Indian equivalents for international scientific terms and is of considered opinion that such an effort will have an adverse effect on the growth of Indian science.

On the basis of the above suggestions, the Council recommends that it is essential for every science student to know at least one of the following foreign languages: English, French, German, Italian or Russian, and that for those

knowing only one foreign language, a knowledge of English is to be preferred.



### Indian National Commission.

A meeting of the Sub-Commission for Science was held in New Delhi on the 10th April. Dr. M. N. Saha was elected Chairman of the Sub-Commission and Dr. Bains Prasad, Dr. B. Mukerjee and Prof. K. R. Ramnathan were elected as the members of the Executive Board of the Indian National Commission.

The Sub-Commission for Science reviewed the work of the Field Science Cooperation offices in South Asia and resolved that the working of the Field Science Cooperation Office at Delhi had been helpful to the Indian Scientists and that appreciation of its services be recorded by the Indian National Commission. The Sub-Commission recommended that the scientists all over the country be invited to make greater use of the services of the Field Science Cooperation Office at Delhi.

The Sub-Commission welcomed the directions of the Third General Conference on the Popularisation of Science, and suggested the institution of a separate Section for the purpose under the Ministry of Education. It further recommended that an Advisory Committee be appointed to advise that Section in its work. The Advisory Committee should have, besides nominees of the Government of India, the following representatives of the Sub-Commission: Dr. Bains Prasad, Dr. D. S. Kothari and Dr. B. C. Guha.



Prof. S. N. Bose and Dr. J. C. Ghosh have been nominated as members of the Indian National Commission for cooperation with the UNESCO in place of Prof. Birbal Sahni (late) and Sir C. V. Raman (resigned).



### World Resources Conference.

World Resources Conference under the

auspices of the UNO was held at Lake Success on the 18th August, 1949. The official Indian Delegation to the Conference was led by Dr. S. S. Bhatnagar Secretary, Department of Scientific Research, Government of India and it included Dr. J. C. Ghosh, Dr. J. N. Mukerjee, Dr. S. L. Hora, D. M. S. Krishnan, Prof. P. C. Mahalanobis and Mr. A. N. Khosla.



## VIEWS

### Research Atmosphere in India

*Communicated by the Delhi Branch of the ASWI*

Some time back a question was raised by the Prime Minister at Bangalore which was also editorially commented upon in January (1949) issue of the *Current Science* that there seemed to be something wrong with the research climate in India. Indian Research scholars when working in some foreign research institutions often turned out promising type of work but when they came back to India their enthusiasm for work died away in one or two years and frequently they went over to some non-laboratory or non-creative jobs. Consequently the money spent on training abroad failed to bring in adequate returns. The ASWI has been called upon to go into the matter and suggest ways and means to remedy it. This question may be better appreciated if we look at it in its historical and cultural perspective.

As a result of the industrial revolution in some of the European countries and in America, big financial combines had come into existence by the close of the last century. Naturally, it was found more profitable by these countries to establish some semi-manufacturing concerns in their colonial countries. In the mother countries an atmosphere of scientific research was created. The State and the Industries helped and encouraged this development. Apart from fundamental research newer discoveries and developments in technology, however small, were adequately appreciated. But similar efforts in the colonies were positively discouraged. The over-all industrial operations were so plann-

ed that colonial industries were made dependent on the industries in the metropolitan countries. The development of modern science and scientific research in India took place in this economic background. Consequently development of science as a profession and scientific research were tied down to conditions not favourable for proper growth and development.

Along with this factor was linked the mass unemployment in India. In the Indian Universities majority of students preferred to join science classes not for the love of science as such, but because a degree or certificate in science afforded greater facilities for securing jobs or admission into medical, engineering or other technical professions. This attitude born out of sheer necessity persists throughout the career of an average Indian scientific worker and pervades the research atmosphere which he creates.

With the above preliminary remarks an attempt has been made to discuss more fully the existing state of 'research atmosphere' in India. The conditions which prevent the development of a proper atmosphere for research in this country can be described under the following categories:

#### A. Economic insecurity of scientific workers:

(a) Majority of the research workers employed today in the Government departments have been kept on temporary basis throughout the period of war and the years following. This insecurity of service has now resulted in the development of a sense of frustration and lack of interest in the work. Therefore immediate steps should be taken to confirm scientific workers with a continuous service of two years or more in their appointments.

(b) The insecurity of service in industry is well known. When a new process or a new plant is to be set up, trained scientific workers from other concerns are brought or more often bought over at attractive salaries but as soon as the initial work is completed or the details of the newer process picked up by the

subordinate staff, the services of the erstwhile experts are very often dispensed with on some pretext or other and some trained junior workers replace them on a much smaller salary. Active steps should be taken by the Government to put a stop to such harmful practices which harm the scientific workers, the industries and ultimately the country.

(c) As already pointed out in the memorandum by the Central Executive Committee of the ASWI on Central Pay Commission recommendations, the remuneration in the scale 160-10-330 is far too little in relation to the work expected out of a research worker. Although the grades of 160-10-330 and 250-25-500 were recommended by the Pay Commission, in actual implementation only a very small percentage have got the senior scale. Immediate steps should be taken to make the scale of 250-25-500 as the minimum for an M. Sc. engaged in research and/or teaching.

(d) Because of this insecurity of service many research workers try and some actually get into more secure but non-creative, non-laboratory jobs. This tendency to treat research simply "for marking time" is specially prevalent in Universities where amounts of scholarships and remunerations are exceptionally low and inadequate. It is therefore recommended that uniform scales of pay as recommended above, with suitable modifications for persons with higher qualifications be adopted in all institutions.

(e) Adequate remuneration should be paid to research workers in industries in the form of bonuses, prizes, etc., for technological developments of economic value, invented or suggested by them.

#### **B. Direction and Organisation of research and provision of suitable facilities :**

(a) It has often been noticed that research institutions do not have a planned programme of work and also no serious attempt is made to determine the aptitude of the research workers. The problems are allotted in a very random and

half-hearted manner. It is, therefore, recommended that research institutions should be made to have regular programmes of research, so that under suitable guidance the research worker can make his choice.

(b) Various Government Departments make grants for short term schemes with a view to obtain immediate returns, without giving the research worker sufficient time to study the problem, which usually leads to unfruitful results and wastage of money. It is therefore suggested that greater stress should be laid on long range programmes of research.

(c) In order to have a balanced growth of research, greater attention should be paid to development of fundamental research, than at present.

(d) Scientific workers should be given opportunities for improvement of their qualifications. Special facilities should be provided by the institutions for refresher courses or work for higher degrees. Sufficient library and laboratory facilities should be provided and arrangements should be made for keeping the laboratories and libraries open after the normal working hours. Sufficient guidance should be provided to the fresh entrants to develop their talents.

(e) Heads of the research institutions should be vested with sufficient powers to arrange for procuring essential items and accessories required by the workers by local purchases if necessary.

(f) The Department of Scientific Research which has been started with the specific purpose of co-ordinating research should be asked to enlarge the scope of its activities in a more effective manner. Sufficient funds should be provided to the Universities for the specific purpose of providing better facilities for teaching and research.

(g) For proper development and growth of 'research atmosphere' in educational institutions, including the Universities, the heads of the departments should be entrusted with as

little of teaching work as possible. Unless such professors are partly released of routine administrative duties and lectures, practical classes and tutorials they can never find time to keep abreast with current literature and guide the research work with such attention as the work deserves.

### C. Publication of work.

(a) In many Government institutions the research workers are placed either under the charge of persons with no technical qualifications or persons who because of their lack of contact with the research problems cannot appreciate the work properly. This leads to undue interferences and sometimes virtual obstructions in the publication of the results of work. Therefore it is recommended that all research work done in Government departments should be subject to scrutiny only by the experts in the particular branch of science. And scientific workers, irrespective of their status in the department should be allowed to publish their work.

(b) The practice of associating the name of the Head of the Department with research paper even when he has taken no active part in the compilation of the work, should be discouraged.

*Other views on the above subject will be accepted for publication in these columns.*

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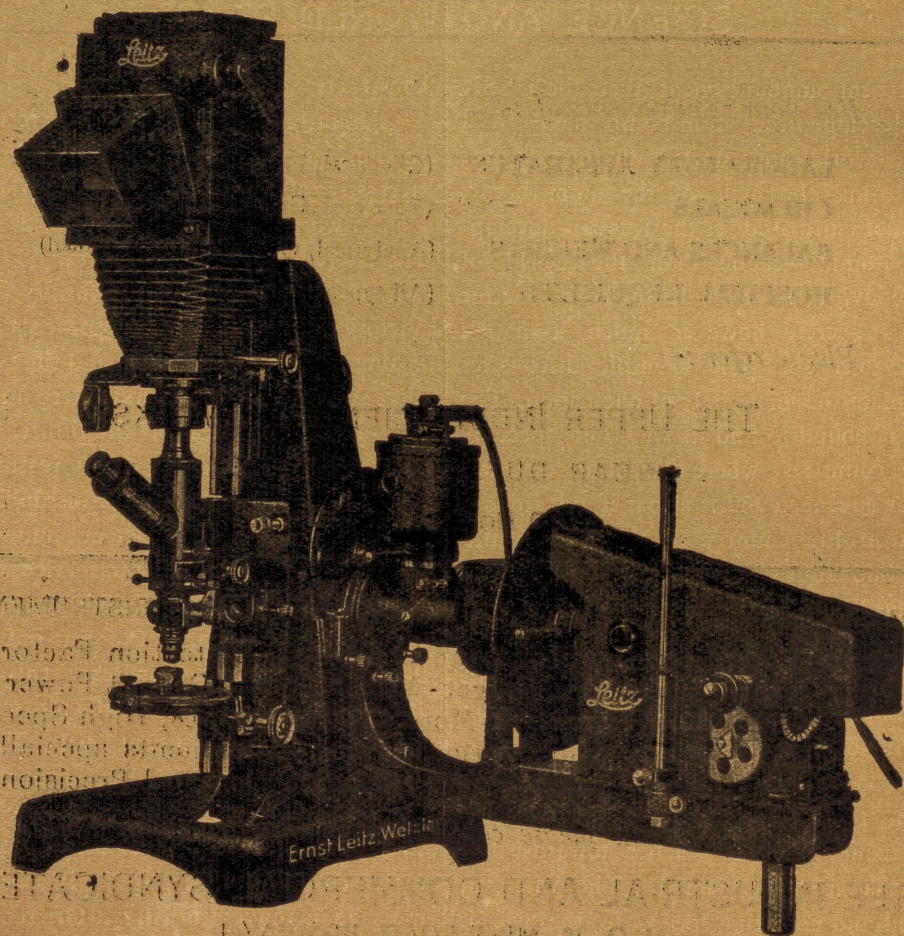
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# VIJNAN-KARMEE

No. 6 November, 1949

## SCIENCE AND WORLD PEACE

The recent announcement that the USSR has now developed the atom bomb has stirred the whole world and started all the talk over again regarding the evils of the atom bomb. We are not surprised at the Russian development of atomic weapon. In the world of science today, it is difficult to keep scientific progress a secret, however much a nation would like to do so. The scientific discoveries do not remain the monopoly of one nation. The discovery is bound to find its way out specially to those countries where scientific development is far advanced and is at par if not higher than that in the country of the origin of the discovery and thus the futility of secrecy in science has once again been shown. The development of the atom bomb may appear as the crowning glory to a scientist's achievement in science but the way it is used as a weapon of destruction, cannot hold the scientist to blame for having discovered it after years of patient research. It is those who try to use this achievement of science towards destruction that are to be blamed. The American atom bomb did not bring peace to the world. The stoppage of war immediately after the explosion of the atom bombs was a lull as a result of bewilderment and not real peace. It is hoped that successive developments of atomic weapons by other nations will not increase the possibility of another global war and that the UNO Atomic Energy Commission will, without further delay, find a solution so that the atomic energy will not be used as a war-weapon but it would be useful for

constructive purposes.

Pandit Jawaharlal Nehru in his recent address to the United States Congress referred to the necessity of harnessing science for the preservation of world peace and freedom of humanity. He is reported to have said, "Two tragic wars have demonstrated the futility of warfare. Victory without the will to peace achieves no lasting result and the victor and the vanquished alike suffer from past wounds, deep and grievous, and a common fear of the future. It is not flattering either to the man's reason or to our common humanity. Must this unhappy state persist and the power of science and wealth continue to be harnessed to the service of destruction?" It is cheering to note that a section of humanity is thinking-not of war but of peace. The Nobel Laureate for Peace this year, Lord Boyd-Orr has said, "It is difficult to get nations to cooperate on a political level. The world is torn by political strife. But through the FAO the nations are cooperating and planning for the greatest movement that will make for peace-increased food production." In his Christmas message in 1947, Lord Boyd-Orr remarked that 'the evil days had come upon us because the powers of science were used in war to destroy wealth and modern weapons of propaganda were used to stir up fear. The only way to get rid of these evils was to harness the forces of science and make them serve mankind?'

The award of Nobel Prize for Peace to a scientist for his activities towards harnessing science for the welfare of the humanity shows that the service of science has been recognised

as a potential force to ensure world peace and it is the scientific workers who must rise to the occasion in creating an effective voice to stop

misuse of science and pave the way to peace and prosperity.

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## FAT AND FOOD

The FAO in their Nutritional Studies No. 2 have published a small report prepared by the Nutritional Division of the Food and Agriculture Organisation of the United Nations on the subject of Synthetic Fats and their potential contribution of world fat requirements. Since it is believed that the world shortage of fats would last for at least a decade, the second session of the FAO Conference (Copenhagen, September 1946) suggested that the Organization obtain information on the manufacture of synthetic fats and their possible use as human food.

The manufacture of synthetic fats for human consumption was regarded by the Nazis as a triumph of German Science and enjoyed special approval and support. The information given in the report deals with the manufacture of synthetic fats in Germany. The fact that it is now possible to synthesize from non-biological and even from inorganic materials, a food of calorific value is extremely significant and is revolutionary, though no final conclusion on the nutritional value of synthetic fats could be drawn at the present. The Chief of the Reich Health Office, however, claimed perfect suitability of synthetic fats for human nutrition. Even if the synthetic fats could not be utilised for human consumption the production of such fats would no doubt reduce the pressure on the natural fats used for human consumption by utilising synthetic fats for industrial purposes.

Apart from the attempts to synthesize fats, attention has recently been focussed on the production of more fats from plant life. The development of Palm Oil Industry in the Belgian

Congo and the East African Groundnut Schemes are the instances in point.

India grows a considerable quantity of groundnuts. Efforts have now been made to improve the quality of this crop as could be seen from a recent report that the East Punjab Department of Agriculture have developed a strain of groundnuts which would give a larger yield per acre. Efforts are being made to conserve in the country as much of the food material from groundnut allowing only the export of oil from the country. Groundnut oil is unfortunately not a good keeper and deteriorates in quality very rapidly. Processing of the oil is, therefore, required and hydrogenation is considered to be the most scientific method to better the quality of oil and reduce storage and handling losses. Unfortunately, as could be seen from the press, very severe criticism is made against the use of hydrogenation of groundnut oil which is consumed under the popular name of *vanaspati*. It is gratifying to note that the Ministry of Food have appointed a special Committee to enquire into the acceptability or otherwise of *vanaspati* as a good healthy food stuff and the report of the Committee is anxiously awaited. Such kinds of hydrogenated oils are used on big scales in different countries of the world without any ill effect. If the production of hydrogenated groundnut oil is considered suitable as a result of the investigation carried out by the Committee, then there is a big scope for development of this industry in the country, an industry which is based on the labours of scientific research workers.

## NOBEL PEACE PRIZE FOR A SCIENTIST

In our last issue we welcomed the formation of the National Nutrition Association of India and now we are glad to announce the award of the Nobel Peace Prize to Lord Boyd-Orr essentially a nutritionist and for a long time the Director of the Rowett Research Institute, Aberdeen. Lord Boyd-Orr had been the first Director-General of the U. N. Food and Agricultural Organization.

In our Editorial on Food and Science in one of our previous issues we had observed that the idea of having plenty to eat was in itself a sense

of security. It appears—the necessity of having plenty to eat—as a vital factor in achieving peace in this world—has been recognized by those who are responsible for making this award. Lord Boyd-Orr also thought that the award was in connection with his proposals for a world food plan to double food production and to bring contentment to the people who were in revolt against their hunger and poverty. A world of plenty and world prosperity were the only foundation for a world of peace.

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## NOTES AND NEWS

### Scientific Workers and Trade Unionism

Mr. Gulzarilal Nanda, Minister for Labour, Government of Bombay inaugurating the popular science lecture series of the Poona Branch of the ASWI outlined the useful role scientific workers can play in the trade union movement, in alleviating the economic plight of the country by lending their scientific skill for rationalisation of production, elimination of waste and harnessing human and material resources to the best advantage of the nation.

Discussing the various aspects of Trade Unionism, Mr. Nanda remarked, "the conflict of ideologies has enveloped trade unionism all over the world. I wish trade unionism to have an internal unity and be in a position to work for the emancipation of the workers from their present economic bondage. Working class strength lies in unity. It was, however, when politics entered our lives and movement prominently that there was a split in trade unionism. If there were no politics, trade unionism would be quite different. Yet, it is possible for the working class to agree on general fundamentals where broadly-speaking their interests are the same

without the shades of political ideologies coming in.

"But this handicap is not and need not be there in the case of scientific workers because they are people who cannot only lead their own group but other groups as well. I hope that at least in the ranks of scientific workers these dangerous tendencies will not creep in. Whatever politics they have, it will be politics acceptable to the entire body of workers. Any thing which will create a cleavage in their ranks should be kept out. A trade unionist must work primarily in economic spheres and his chief object is to protect and promote the interests of his group.

"In the past, employers resisted the union of technical staff because they were considered an extension of managerial staff. That stand has now been abandoned. The question is whether technicians can join workers' unions. Scientific workers and Technicians may have separate unions and yet play a very important role in trade union movement. They can actually evolve solutions of those difficulties about imposition of control from above and

workers' control which may not be efficient.

"The functioning of trade unions as instruments of struggle is decreasing in importance as democracies create agencies for settling disputes without workers resorting to strikes.

"The explosion of the atom bomb in Russia and its implications are readily understood by scientific workers. I have been in touch with the science of social affairs and in those terms I interpret that development. I believe the emphasis is now going to be shifted from the mechanical aspect of warfare because if the parties get even with their scientific knowledge then the centre of gravity will change to a war of ideas. Action will shift to the plane of propaganda in social affairs and political administration. If democracy does not succeed quickly in grappling with this problem and bring about a fairly satisfactory arrangement with regard to the requirements of the common man, his material needs and the satisfaction of those needs, if a harmonious order is not established in the present democratic setup, I believe the future is very gloomy, and the whole world will go under the shadow of death. That condition will not last, but it will have done great damage to the world. I hope it will be averted and scientific workers will be able to do something helping to avert that catastrophe."



#### Research activities in Union List.

Dr. M.R. Jayakar, Vice-Chancellor of Poona University while speaking before the post-graduate students of Nowrosjee Wadia College on publication of research work, suggested that the research activities carried on by the Universities etc., should be placed in the Union List. He said that he had suggested to the University Commission that the higher education should be put on the concurrent list. He admitted that the present Provincial Governments while encouraging the higher education, may not perhaps be able to finance this important activity of the Universities to a very great extent.



#### Scientific Aspects of Silk Production.

Our contribution to the scientific studies of the silkworm and of its fibre, have not been comparable either in quality or in quantity to those made by others in this field. Our researches in this direction would be appraised as comparatively inconsequential, mediocre and third rate. The reasons are not far to seek. In spite of the great and abiding interest which our National Government have recently been evincing, the general conditions for scientific work in the country still remain uncertain and discouraging; they cannot attract first-rate men to take up scientific research as a career. Plans and proposals for starting a Central Institute for Silk Research, we are told, were made three years ago; nothing concrete, however, has so far emerged. The Government has been slow in taking decisions in this matter.

*Current Science, September, 1949.*



#### Science Secrecy and Security

Sir David Rivett, the retiring President of the Society of Chemical Industry addressed the 68th Annual Meeting of the Society held at Manchester in the middle of July on "Chemists and the Commonwealth." He dealt with the problem which today confronts scientists in many countries, the problem of science, secrecy and security. Sir David is the Chairman of the Commonwealth Council for Scientific and Industrial Research and he referred to the recent order placing the Council under Direct Governmental control. This move in his opinion, had robbed the council of all the outstanding gifts bestowed upon it by successive governments the field on which to pursue their investigations in accordance with their own estimates of the scientific needs of the country and the scientific ability available to cope with them. This change was prompted by a political campaign which alleged that there were on its staff people who cannot be relied upon to respect such rules as were in force covering "classified information." It sprang from a

widespread feeling that all scientific work, even if it appeared only remotely associated with war technology, should be closely guarded, controlled and in greater or less measures kept out of view. Even its directions of development should be kept under supervision. Sir David attacked this view point as follows: "Assuming that Security is a present democratic demand and aim, how may it best be attained, so far at least as scientific work is concerned in view of the present power politics. The impetuous reply is "through secrecy," but the more thoughtful reply is surely, "through achievements." At once we are up against the hotly debated question as to whether secrecy and achievement are compatible; and again a categorical answer, free from all qualifications, is difficult.

The attack on the freedom of science was not, in Sir David's view, a local problem in any country. Although he did not see any way out of the maze, he thought the situation would best be handled by men capable of seeing every side of the problem as it exists today. For that reason he pleaded for more co-operation and integration by scientists in every country.

*Food Magazine, September, 1949.*



### **Portable Atomic Pile**

Asparton, a miniature atomic pile, produces radioactive isotopes, which are of great value in medical work and research. The instrument is easily portable (weight two cwt.) and specially designed for use in hospitals, medical centres and research units. It uses uranium, in the form of pure oxide, arranged in a specially designed double wall of metal. It is provided with adequate safeguards against radiation.

*British Information Services*



### **Application of Science to Industry**

Research Associations in Britain have solved the problem of applying scientific discoveries speedily to industry. There are some 35 such

Associations in Britain to-day. The British Iron and Steel Research Association and the British Ceramics Research Association have developed a new type of bricks from magnesia extracted from sea water, for lining open hearth furnaces. This has resulted in an increase of 10% in the production of steel, a vital commodity. The importance of such Associations, lies in providing opportunities for essential research in industries whose individual units are usually too small for any real research to be done e. g. the baking industry.

In the cotton industry, a new method of weaving has been developed, in which soft, twisted yarns are used with the maximum backing of threads. When the cloth is wet the fibres swell and close the space between them, producing at most an ideal water proof fabric.

Another useful discovery is the sampling of bales of cotton by making use of the difference in buoyancy of cotton lint and rubbish. The method is cheap and infallible and estimates the amount of dust, stack and seed in cotton bales.

A statistical survey of the size of peoples' feet carried out by the Boots and Shoes Trades' Association, revealed that any normal person could be fitted from a selection of 30 fittings instead of over 100 as previously considered necessary.

The Research Associations Scheme, has proved so useful that plans for several more are being laid.

*British Information Services.*



### **British Labour Party Policy on Science.**

The Labour Party has published a 15-page pamphlet entitled "New Deal for Science" which recommends a number of steps that should be taken to encourage scientific research and development. The recommendations emanate from a committee which the Labour Party set up last year to advise on the Party's policy for science and this committee included a number of scientists, trade unionists and managers.

The pamphlet begins by explaining the various ways in which the present Government has already contributed to the furtherance of scientific development in Britain. Here it mentions the appointment of the Advisory Council on Scientific Policy, the Defence Research Policy Committee and the Committee on Industrial Productivity. It is claimed that the work of the Agricultural Research Council has expanded rapidly since 1945, while the Department of Scientific and Industrial Research has increased its grants to industrial research associations by more than £1 million a year. Government grants to the universities (much of which is spent on research) have risen from £2 million to £17 million. Of Civil Service Science in general the pamphlet says, "Science has been given a permanent place in the machinery of government. Thus the growing importance of the Scientific Civil Service has been recognised by the improvement of salary scales. Government scientists, other than those of defence work are now allowed to publish results in their own names and so add to the publicity of available knowledge. This is an example which should be followed more widely in industry".

British industry is criticised for failing to apply science to the maximum extent. Private firms, claims the Party's committee, have ignored some valuable results obtained by Government scientists, and here it is suggested that the National Research Development Corporation will be important in taking up such results and exploiting them for the public benefit. Another recommendation for bringing about more efficient use of science in industry involves the setting up of a scientific information office under the auspices of the D. S. I. R. which would extend the work at present carried out by that Department's Intelligence. It is also urged that there should be an Industrial Extension Service which would do for industry what is already performed for agriculture by the National Agricultural Advisory Service.

The Committee makes several recommendations concerning Research Association, whose work the report describes as having been most valuable. It is pointed out that the Government has the power to compel any firm to become a member of, and to subscribe to the relevant Research Association. The committee advocates the use of these powers when important firms refuse to show interest in co-operative research. That hostility on the part of the workers can hold up industrial application of science is recognised, but this could be broken down in various ways ; for example by putting trade union representatives on the governing bodies of more Research Associations.

The committee expresses its desire that all scientific findings of industrial research should be published, but then goes on to comment : "Greater freedom of publication can only be extended gradually and may never be complete as long as there are profit-making private firms". One hopeful approach, it is suggested would be for the scientists themselves to create a professional code according to which they would be free to publish the results of research done for private firms unless there were the strongest reasons to the contrary.

The report is emphatic on the need to attract scientists to university for research and teaching, and demand better salaries for university teachers, especially in the lower grades, and for school science masters.

Finally technical education receives attention. Here the committee calls for the strengthening of the applied science faculties in selected universities in industrial areas and for the creation of institutions with status equivalent to that of California Institute of Technology or the Technical Institute of Zurich. Local technical colleges ought to be able to provide courses of university standard leading to a bachelor's degree. Moreover, research in these colleges should be encouraged by Government grants.

*Discovery, September, 1949*



### Loyalty clearance of Scientific Workers in America.

A Presidential Commission on Science and National Security was recently proposed by the Federation of American Scientists in a letter cosigned by 145 prominent scientists and sent to the President on July 8. Initial reaction from the White House indicates that even wider sponsorship will be required if the proposal is to be given favorable consideration. The text of the letter is reproduced here :

"The current controversy over the Atomic Energy Commission has once again focussed attention on the problem of security in relation to scientific discovery. We are deeply disturbed by the misconceptions which have been voiced recently on this subject, and by some measures which have been proposed for the prevention of espionage directed at our atomic weapons. We fear that in the heat of controversy important values are being overlooked and may be carelessly sacrificed.

"The dilemma of secrecy *versus* long range security has plagued us since the end of the war. The demonstration of the potency of science as a military adjunct, so dramatically and horrifyingly driven home at Hiroshima, has led to two almost universally accepted conclusions — first, intensive cultivation of science is essential to national security; second, since scientific knowledge of certain kinds and in certain circumstances, may have great military significance — there are advantages in withholding it from potential enemies. We are slowly becoming aware, as a nation, that ill-considered implementation of these two conclusions can lead to very serious conflicts. For the narrowest interpretation of military security demands that we reveal nothing that might conceivably be useful to a potential enemy, and that the information of possible military significance available to any individual scientist be kept at a minimum. On the other hand, the experience of science is that the withholding of knowledge, or the abridgment of freedom of thought, is a deadly

contamination which very rapidly inhibits research. How are we to reconcile these two apparently conflicting requirements? How can we safeguard the existing knowledge what is essential to military security, without so debilitating science as to sacrifice the hope of obtaining additional knowledge?

"You yourself, Mr. President, pointed out the importance of scientific progress to the national welfare, and the grave danger to science, of the continuance of an atmosphere of suspicion and distrust. For five years we have been trying to balance the legitimate security needs of the nation against the equally insistent needs of free scientific inquiry. Largely this has been done by improvisation in individual instances with little attempt to develop or follow a comprehensive national policy. Security decisions have been left to individual government agencies, often subject to various uniformed pressures. Without benefit of full discussion of the issues, public understanding has remained at a low level and, in consequence, public opinion has drifted perilously close to hysterical insistence upon secrecy at whatever cost. The situation has become so threatening, not only to scientific progress but to traditional American political freedom, that we feel that only through action on your part can the problem be brought under control.

"Therefore, we respectfully urge that you appoint, at your earliest convenience, a Special Commission on Science and National Security. We urge that this Commission be composed of foremost scientists and educators, outstanding men of public affairs, and representatives of Congress, the National Military Establishment, and other agencies of the Executive Branch. We urge that this Commission make a full investigation of the entire problem of security requirements in relation to the requirements for maximum development of science. We believe that the Commission should study, among others, the following questions :—

1. What are the limits where excessive

attempts at secrecy diminish instead of preserve our national security?

2. What are the areas of science to which security measures can and should apply?

3. What classification procedures give maximum protection of information of military value with minimum restriction exchange of information of purely scientific value?

4. To what extent, and under what conditions, should classified research be conducted outside our military laboratories?

5. What types of clearance procedures are effective, and admissible within the bounds of scientific and democratic tradition, in military laboratories, in non-military governmental laboratories, in non-governmental laboratories?

6. What would be the effect on the morale of scientists and on our total scientific program of applying political tests for participation in non-secret scientific work through requirement of (i) oaths and affidavits, or (ii) investigation and clearance?

7. What have been the effects of present security measures and procedures on our scientific research programs, particularly in government?

"We believe that the Commission should study these matters not only with the objective of reporting to you its conclusions and recommendations, but with the thought as well of providing a factual background on security procedures now in use, specific studies of the effects and effectiveness of these procedures, ways in which similar problems are handled in other countries, etc. We have been too long security-conscious with insufficient security education.

"American scientists differ in no way from their fellow-citizens in their desire to protect the best interests of their country. They seek no special dispensations or privileges. In opposing extreme advocates of military security they are really seeking not less security, but more. Our real strength lies not in the guarded knowledge of the moment, but in our ability to

to keep in the forefront of advancing knowledge. We recognize that the issue of security *versus* freedom of science is one of the public policy and that opinions others than those of scientists must enter into its resolution. It is for this reason, and because we are convinced that the matter is of urgent importance, that we ask for the establishment now of special Presidential Commission of broad representation and scope."

*Science, August, 26, 1949*



### Two Aspects of the Loyalty Problem

The integrity of science and scientific education in this country is seriously jeopardized, and can be maintained only if scientists generally and the National Research Council in particular are alerted to the dangers inherent in the requirement of "clearance" and "loyalty" oaths for research fellowships and nonsecret work. Actually the dangers are not confined to science although they are most acute there. The principle stated by the Congressional interrogators of Dr. Smyth and others is that no one should be educated at public expense who may not be acceptable for government work by the terms of the Federal Loyalty Order, "who would not in the future be eligible to work for the Government in classified fields". This would apply to National Science Foundation Fellowships and any other publicly supported grants. In view of the clearance difficulties of some of our most outstanding scientists, and the irresponsible interpretations recently given to routine Federal Bureau of Investigation reports, this condition is manifestly generating fear and insecurity.

An oath unaccompanied by an FBI investigation may sound harmless - an oath of allegiance, as a safeguard against treason, is surely unexceptionable. But an oath covering "past and present membership in various organizations," under penalty of perjury, to determine the "subversive and reasonably potentially subversive," is quite another matter, and it is on this that some scientists have compromised.

Our Atomic Energy Commission fellows have already been asked to take general and inclusive oaths, subject to interpretations which can only become clear as time goes on. An oath involving the beliefs of both the individual signer and the organizations (whatever "belief" may mean in this case) to which he may belong or which he supports (whatever that means), has been written into the National Science Foundation bill now before the House of Representatives. It would be folly to expect that these oaths would not be followed by some sort of investigation, and any attempted guarantee to the contrary would be ridiculous. Oaths of this kind open the possibilities of irresponsible accusations, and of legal procedures based not on acts but on opinions which for one reason or another may not be popular at the moment. The chain of associations is endless. Will the Professor be deterred from making recommendations without investigating his student's review, since any difficulties will also involve him? Dare a student study with any conformist professor, however brilliant, since he may need simon-pure recommendations?

The words "subversive" and especially "potentially subversive" are variable terms: on the whole they are expanding, becoming more comprehensive, at the present period. According to Senator Hickenlooper, subversive "probably means generally someone who believes in doing substantial harm to our form of government and to our institutions". One could agree unthinkingly, yet only a few years ago a National Science Foundation itself was regarded as an idea considerably to the left of centre, and it took a brave scientist to stand up and defend publicly the public support of science. How about national health insurance and public housing? According to many they will do substantial harm to our institutions, and even to our form of government; and one has only to believe in them.

It is a wholesome exercise to remind ourselves that there have been definitions of loyalty quite

different from that in current vogue. According to the Connecticut Yankee (iaalies Mark Twain's):

"Under that gospel, the citizen who thinks he sees that the commonwealth's political clothes are worn out, and yet holds his peace and does not agitate for a new suit, is disloyal; he is a traitor. That he may be the only one who thinks he sees his decay, does not excuse him; it is his duty to agitate anyway, and it is the duty of the others to vote him down if they do not see the matter as he does.

"You see my kind of loyalty was loyalty to one's country, not to its institutions or its office-holders. The country is the real thing, the substantial thing, the eternal thing; it is the thing to watch over, and care for, and be loyal to; institutions are extraneous, they are its mere clothing, and clothing can wear out, become ragged, cease to be comfortable, cease to protect the body from winter, disease and death. To be loyal to rags, to shout for rags, to worship rags, to die for rags — that is a loyalty of unreason, it is pure animal; it belongs to monarchy, was invented by monarchy; let monarchy keep it. I was from Connecticut, whose Constitution declares "that all political power is inherent in the people, and all free governments are founded on their authority and instituted for their benefit; and that they have at all times an undeniable and indefeasible right to alter their form of government in such a manner as they may think expedient."

Of course this is a very radical statement; one would not have to go nearly so far as to act in accord with it to be refused clearance for secret work. We are perhaps not in immediate danger of having Mark Twain barred from school libraries, but we are already afraid of having people take him, or the constitution of Connecticut, too seriously. And unless we resist completely this latest invasion of the personal beliefs of students and their teachers, we are inviting the kind of atmosphere which pervaded Germany in the thirties, stifling

academic achievement generally and science in particular.

Theodor Rosebury and Melba Phillips, American Association of Scientific Workers, New York Branch.

*Science, July 29, 1949.*



The Scientists' Committee on Loyalty problems has been studying the loyalty and security clearance procedures of different government agencies for some time while these procedures could be improved in many ways, the committee wishes to point out to scientists that they themselves, even under present procedures, can better the situation.

The following proposal aims at raising the level of the confidential reports on which clearance decisions are based. In most investigations, agents of the FBI obtain information from friends, neighbors, and colleagues of the person to be cleared, as well as from the less direct sources. The results are collected in a confidential dossier in which the sources of information are often anonymous, or revealed only to a very limited number of officials. It is obvious that these unacknowledgeable statements can cause serious misunderstanding which cannot easily be clarified, especially in cases where the clearance status meets with difficulties.

It is, therefore, strongly recommended that all scientists adhere to the following rules whenever possible;

(1) When giving information to loyalty and security investigators, state willingness to testify if necessary.

(2) Prepare a signed, written statement of the information for the investigating agency.

*Scientists' Committee on Loyalty Problems:*  
Lyman Spitzer, Jr., Chairman, William A. Higinbotham, Associate Chairman; Arthur S. Wightman, Secretary; Donald E. Hamilton, Treasurer; David Bohm, Roy Britten, Robert R. Bush, Elmer G. Butler, Albert Einstein, Luther P. Eisenhart, Samuel A. Goudsmit., M. Stanley

Liggingston, Stuart Mudd, David Pines, Oswald Veblen, Irving Wolff.

*Science, July 29, 1949*

### Civil Liberties of Scientists.

On December 30 1947, the American Association for the Advancement of Science Council passed a resolution instructing the President of the Association to appoint a Special Committee on Civil Liberties for Scientists. Maurice B. Visscher was named chairman, and with Philip Bard, Robert E. Cushman, Richard L. Meier, and James R. Newmen as members, and Walter Gellhorn as consultant, the Committee completed its investigations and submitted a 77-page report of findings and recommendations in December 1948. The full text was referred to the Council, which voted by an overwhelming majority to publicize the findings (an abstract of which is published below), and it is planned ultimately to make the complete report available at cost to those who want access to it.

THERE IS AT PRESENT A tendency in public thinking to relate scientific activity almost wholly to military activity, exposing scientists more than most occupational groups to sustained and stringent limitations upon their professional freedom. Fearful lest these limitations exceed justifiable bounds, jeopardize the national welfare, and infringe the rights of scientists, the American Association for the Advancement of Science, in December, 1947, created a Special Committee on the Civil Liberties of Scientists.

The present report embodies its conclusions and recommendations with respect to three main areas :

1. Restrictions on research and scientific information :
2. Measures to assure the personal reliability of scientists having access to confidential data :
3. Inquiries relating to the "loyalty" of scientific workers in federal employment.

## Conclusions

### I

Secrecy is damaging to both science and democracy. In both, progress and detection of error depend upon open discussion and free interchange of ideas among widely divergent and widely separated groups.

Yet today, in the United States, we have within the body of science large regions of secrecy. We endorse the statement of the President's Scientific Research Board, which in its 1947 Report on Science and Public Policy said: "Strict military security in the narrow sense is not entirely consistent with the broader requirements of national security. To be secure as a Nation we must maintain a climate conducive to the full flowering of free inquiry. However important secrecy about military weapons may be, the fundamental discoveries of researchers must circulate freely to have full beneficial effect ... Security regulations, therefore, should be applied only when necessary and then limited to specific instruments, machines or processes. They should not attempt to cover basic principles of fundamental knowledge."

### II

No matter how the area of secrecy may be delimited, there will undoubtedly remain some matters of scientific cognizance which should be kept confidential. So long as national policy dictates that secrecy be observed, the reliability of persons to whom these matters are entrusted must be assured; hence inquiries into the character and attitudes of these persons are warranted.

If national as well as individual interests are to be protected, however, improvements must be achieved in the policies and procedures of our present security clearance programs as they affect scientists who will be entrusted with classified information.

The Atomic Energy Commission and the National Military Establishment are the chief agencies concerned with the trustworthiness of

scientists who have access to "restricted" or "classified" data. Neither of these agencies furnishes the affected scientist any statement of the reasoning underlying a conclusion which is adverse to him; neither one sets forth charges in a precisely formulated fashion; neither one requires that testimony used against an individual be made known to him, or that even casual and non-official informants be identified and produced for examination; neither one provides for the making of specific findings of facts; neither one undertakes to record and publish its opinions in a way which makes possible any public understanding or analysis of the determinations made.

In some respects the procedures of the Atomic Energy Commission are more fully elaborated than those of the National Military Establishment, though the Military clearance of the latter may affect literally millions of employees of private industry engaged in the planning or production of articles for military use. A military determination that clearance should not be granted a civilian scientist is subject to appeal to the Industrial Employment Review Board (IERB), composed of Army Navy and Air Force officers. Proceedings of IERB are themselves "classified," which means that even the immediately affected employee is forbidden to discuss them, keep notes about the handling of his own case, or possess a copy of the record of the hearing. Despite the fact that its decisions have a drastically important impact upon the lives and careers of civilians entirely outside the public service, the tribunal is exclusively military in its composition and there is no opportunity for review of its judgments by an appellate body differently constituted. Such subjection of the destinies of civilians to military tribunals is contrary to national tradition. Quite apart from procedural inadequacies, the present organization for deciding security clearance cases is open to basic criticism.

The Atomic Energy Commission has recently

manifested a tendency to require security clearance not only for those scientists who themselves have access to restricted data, but also for their fellow scientists with whom they may have personal contact. This is graver in its implications than even the serious procedural and administrative imperfections already noted. At Brookhaven National Laboratory, for example, where only perhaps one-tenth of the scientific personnel works within the area of secrecy, all scientists must be cleared as a condition of employment. This apparently reflects a yielding to uninformed or sensationalist legislators and others who tend to exaggerate the problems of "keeping our atomic secrets." The effect of the excessive precautions is to discourage participation in important research activities closely linked to the nation's well-being. Scientists are increasingly reluctant to commit their personal and professional reputations to those who have brought frivolous charges against respected colleagues. Moreover, the delays and expense often involved in obtaining security clearance deter qualified persons for entering the atomic energy program.

So far as disclosures of evidence reveal, the problem of faithless scientific personnel in this country appears to be markedly less grave than the public has been led to suppose. Moreover, informed scientists are in broad agreement that restricted data cannot be readily transmitted to unauthorized persons. In the circumstances which exist rather than those which are fancied to exist, the stringent application of personnel security clearance should be limited to smaller numbers of scientists rather than extended to ever larger groups. If nothing is done to reverse the present trend to require security clearance of scientists who do not have or desire to have access to restricted data, it is likely that many of the most penetrating and original scientific minds will be turned to pursuits unrelated to further development of the atomic energy program.

Work in that field will be shunned by men of ability and pride if they are constantly treated as objects of suspicion and possible calumny.

### III

Executive Order No. 9835 provides that no person shall be employed in a federal post if he is believed to be disloyal to the government of the United States. This Loyalty Order does not supplant existing provisions for summary removal of employees on security grounds. Entirely without reference to security considerations, the Order seeks to assure "complete and unswerving loyalty to the United States" on the part of all those who are in its service.

No one doubts the importance of faithful discharge of duty by public officials. No one questions the propriety of the government's demanding that its employees be loyal to their jobs and to the democratic institutions they serve. The Loyalty Order is, however, basically objectionable because it seeks to determine the employee's loyalty by inquiring into his supposed thoughts and attitudes, which are established in large part by imputing to him the beliefs of his associates.

If the Loyalty Order is to be retained, a drastic revision is essential. Instead of focusing on an employee's associations, it should focus on his behavior in overt acts. Legislation already on the statute books amply protects the federal service against retention of employees who advocate overthrow of the government.

In so far as the Loyalty Order purports to deal with such matters as espionage, sabotage, and disregard of instructions, it is wholly superfluous, since conduct of that character is not only criminal but is also fully subject to administrative disciplinary action under existing law and regulations. The failure to confine the Loyalty Order to matters of objective proof has engendered a feeling of insecurity in public employment and may be

expected to lessen the vigorous intellectual independence which is a prime condition of sound scientific work as it is of an imaginative civil service. "Experimentation there may be in many things of deep concern," Judge Cardozo once wrote, but not in setting boundaries to thought, freely communicated is the indispensable condition of intelligent experimentation, the one test of its validity." Unless there is elimination of the Order's present emphasis on attitude rather than conduct, the nation will suffer heavily from the present loyalty program.

Even if the Loyalty Order were to be continued without revision of its underlying philosophy, important changes in administrative methods urgently needed. The present loyalty boards discharge simultaneously the functions of advocacy and adjudications. The content of the charges they issue and the conduct of the proceedings over which they preside do not assure that the facts and their implications will be fully explored. The organizations with which an employee may be identified are finally and conclusively characterized by the Attorney General without either the employee's or the organization's having any opportunity whatsoever to establish that the Attorney General was not fully in-

formed. These and other procedural deficiencies can be corrected readily. So long as they remain they accentuate the possibility of error in the loyalty program.

The fundamental shortcomings in the Loyalty Order, however, are procedural. Rather, they are to be found in the very conception which the Order expresses. Refinement of administrative methods and gentility of official behavior are important, to be sure. But they are not basic. Until the Loyalty Order deals with the way employees act, rather than with the way they supposedly think, we shall inhibit the freedom and encourage the insecurity of our public servants. The cost will in the end be borne not by the employees who are deprived of their normal freedom to believe as they wish within the limits law has set. It will be borne by the nation as a whole.

As President Truman recently asserted. "Continuous research by our best scientist is the key to America's leadership and true national security. This work may be made impossible by the creation of an atmosphere in which no man feels safe, against the public airing of unfounded rumors, gossip, and vilification."

*Science, August 19, 1949.*

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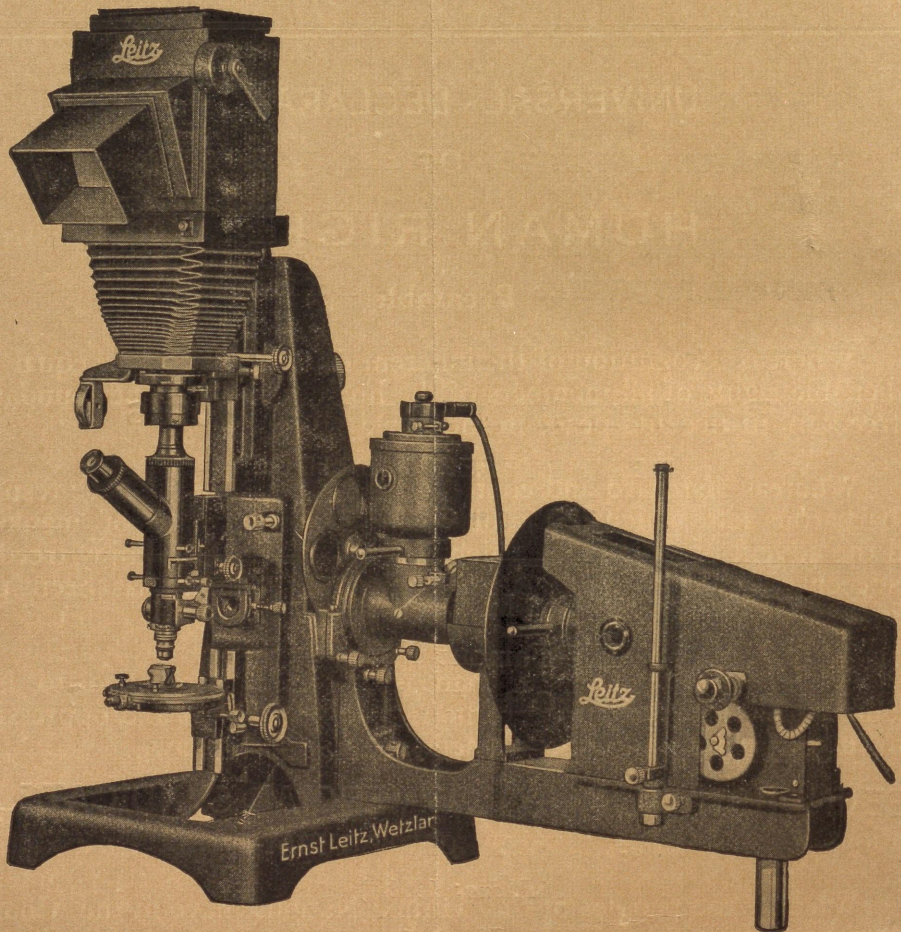
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# VIJNAN-KARMEE

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No. 7 December, 1949

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## UNIVERSAL DECLARATION OF HUMAN RIGHTS

### Preamble

Whereas recognition of the inherent dignity and of the equal and inalienable rights of all members of the human family is the foundation of freedom, justice and peace in the world,

Whereas disregard and contempt for human rights have resulted in barbarous acts which have outraged the conscience of mankind, and the advent of a world in which human beings shall enjoy freedom of speech and belief and freedom from fear and want has been proclaimed as the highest aspiration of the common people,

Whereas it is essential, if man is not to be compelled to have recourse, as a last resort, to rebellion against tyranny and oppression, that human rights should be protected by the rule of law,

Whereas it is essential to promote the development of friendly relations among nations,

Whereas the peoples of the United Nations have in the Charter reaffirmed their faith in fundamental human rights, in the dignity and worth of the human person and in the equal rights of men and women and have determined to promote social progress and better standards of life in larger freedom,

Whereas Member States have pledged themselves to achieve, in co-operation with the United Nations, the promotion of universal respect for and observance of human rights and fundamental freedoms,

Whereas a common understanding of these rights and freedoms is of the greatest importance for the full realization of this pledge,

Now Therefore

---

## THE GENERAL ASSEMBLY OF THE UNITED NATIONS

### Proclaims

**THIS UNIVERSAL DECLARATION OF HUMAN RIGHTS** as a common standard of achievement for all peoples and all nations, to the end that every individual and every organ of society, keeping this Declaration constantly in mind, shall strive by teaching and education to promote respect for these rights and freedoms and by progressive measures, national and international, to secure their universal and effective recognition and observance, both among the peoples of Member States themselves and among the peoples of territories under their jurisdiction.

*Article 1.* All human beings are born free and equal in dignity and rights. They are endowed with reason and conscience and should act towards one another in a spirit of brotherhood.

*Article 2.* (1) Everyone is entitled to all the rights and freedoms set forth in this Declaration, without distinction of any kind, such as race, colour, sex, language, religion, political or other opinion, national or social origin, property, birth or other status.

(2) Furthermore, no distinction shall be made on the basis of the political, jurisdictional or international status of the country or territory to which a person belongs, where this territory be an independent, Trust, Non-Self-Government territory, or under any other limitation of sovereignty.

*Article 3.* Everyone has the right to life, liberty and the security of person.

*Article 4.* No one shall be held in slavery or servitude; slavery and the slave trade shall be prohibited in all their forms.

*Article 5.* No one shall be subjected to torture or to cruel, inhuman or degrading treatment or punishment.

*Article 6.* Everyone has the right to recognition everywhere as a person before the law.

*Article 7.* All are equal before the law and are entitled without any discrimination to equal protection of the law. All are entitled to equal protection against any discrimination in violation of this Declaration and against any incitement to such discrimination.

*Article 8.* Everyone has the right to an effective remedy by the competent national tribunals for acts violating the fundamental rights granted him by the constitution or by law.

*Article 9.* No one shall be subjected to arbitrary arrest, detention or exile.

*Article 10.* Everyone is entitled in full equality to a fair and public hearing by an independent and impartial tribunal in the determination of his rights and obligations and of any criminal charge against him.

*Article 11.* (1) Every one charged with a penal offence has the right to be presumed innocent until proved guilty according to law in a public trial at which he has had all the guarantees necessary for his defence.

(2) No one shall be held guilty of any penal offence on account of any act or omission which did not constitute a penal offence, under national or international law, at the time when it was committed. Nor shall a heavier penalty be imposed than the one that was applicable at the time the penal offence was committed.

*Article 12.* No one shall be subjected to arbitrary interference with his privacy, family, home or correspondence, nor to attacks upon his honour and reputation. Everyone has the right to the protection of the law against such interference or attacks.

*Article 13.* (1) Everyone has the right to freedom of movement and residence within the borders of each state.

(2) Everyone has the right to leave any country, including his own, and to return to his country.

*Article 14.* (1) Everyone has the right to seek and to enjoy in other countries asylum from persecution.

(2) This right may not be invoked in the case of prosecutions genuinely arising from non-political crimes or from acts contrary to the purposes and principles of the United Nations.

*Article 15.* (1) Everyone has the right to a nationality.

(2) No one shall be arbitrarily deprived of his nationality nor denied the right to change his nationality.

*Article 16.* (1) Men and women of full age, without any limitation due to race, nationality or religion, have the right to marry and to found a family. They are entitled to equal rights as to marriage, during marriage and its dissolution.

(2) Marriage shall be entered into only with the free and full consent of the intending spouses.

(3) The family is the natural and fundamental group unit of society and is entitled to protection by society and the State.

*Article 17.* (1) Everyone has the right to own property alone as well as in association with others.

(2) No one shall be arbitrarily deprived of his property.

*Article 18.* Everyone has the right to freedom of thought, conscience and religion; this right includes freedom to change his religion or belief, and freedom, either alone or in community with others and in public or private, to manifest his religion or belief in teaching, practice, worship and observance.

*Article 19.* Everyone has the right to freedom of opinion and expression; this right includes freedom to hold opinions without interference and to seek, receive and impart information and ideas through any media and regardless of frontiers.

*Article 20.* (1) Everyone has the right to freedom of peaceful assembly and association.

(2) No one may be compelled to belong to an association.

*Article 21.* (1) Everyone has the right to take part in the government of his country, directly or through freely chosen representatives.

(2) Everyone has the right of equal access to public service in his country.

(3) The will of the people shall be the basis of the authority of government; this will shall be expressed in periodic and genuine elections which shall be by universal and equal suffrage and shall be held by secret vote or by equivalent free voting procedures.

*Article 22.* Everyone, as a member of society, has the right to social security and is entitled to realization, through national effort and international co-operation and in accordance with the organization and resources of each State, of the economic, social and cultural rights indispensable for his dignity and the free development of his personality.

*Article 23.* (1) Everyone has the right to work, to free choice of employment, to just and favourable conditions of work and to protection against unemployment.

(2) Everyone, without any discrimination, has the right to equal pay for equal work.

(3) Everyone who works has the right to just and favourable remuneration insuring for himself and his family an existence worthy of human dignity, and supplemented, if necessary, by other means of social protection.

(4) Everyone has the right to form and to join Trade Unions for the protection of his interests

*Article 24.* Everyone has the right to rest and leisure, including reasonable limitation of working hours and periodic holidays with pay.

*Article 25.* (1) Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services, and the right to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood in circumstances beyond his control.

(2) Motherhood and childhood are entitled to special care and assistance. All children, whether born in or out of wedlock, shall enjoy the same social protection.

*Article 26.* (1) Everyone has the right to education. Education shall be free, at least in the elementary and fundamental stages. Elementary education shall be compulsory. Technical and professional education shall be made generally available and higher education shall be equally accessible to all on the basis of merit.

(2) Education shall be directed to the full development of the human personality and to the strengthening of respect for human rights and fundamental freedoms. It shall promote understanding, tolerance and friendship among all nations, racial or religious groups, and shall further the activities of the United Nations for the maintenance of peace.

(3) Parents have a prior right to choose the kind of education that shall be given to their children.

*Article 27.* (1) Everyone has the right freely to participate in the cultural life of the community, to enjoy the arts and to share in scientific advancements and its benefits.

(2) Everyone has the right to the protection of the moral and material interests resulting from any scientific, literary or artistic production of which he is the author.

*Article 28.* Everyone is entitled to a social and international order in which the rights and freedoms set forth in this Declaration can be fully realized.

*Article 29.* (1) Everyone has duties to the community in which alone the free and full development of his personality is possible.

(2) In the exercise of his rights and freedoms, everyone shall be subject only to such limitations as are determined by law solely for the purpose of securing due recognition and respect for the rights and freedoms of others and of meeting the just requirements of morality, public order and the general welfare in a democratic society.

(3) These rights and freedoms may in no case be exercised contrary to the purposes and principles of the United Nations.

*Article 30.* Nothing in this Declaration may be interpreted as implying for any State, group or person, any right to engage in any activity or to perform any act aimed at the destruction of any of the rights and freedoms set forth herein.

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## CHAPTER II OF THE ATOMIC AGE

*Leading Article of the Chemical and Engineering News, October 3, 1949*

Chapter II of the atomic age became a stark reality on Sept. 23 when President Truman tersely informed a startled White House Press conference that Russia had achieved "an atomic explosion."

Thus, the so-called secret is no longer a secret, confirming the position taken by scientists more than four years ago that the alleged existence of a secret was mere wishful thinking; that what we did possess in a truly monopolistic sense was a considerable amount of Industrial and technical know-how and that for a limited period of time only. That such knowledge could and would be duplicated by other nations given time and the services of skilled scientists and technologists was well recognized by all closely associated with science and engineering and by those statesmen and politi-

cians who approached the problem objectively.

Scientists and technologists were speaking the truth when they told the American public that Russia could and would have a bomb within 4 to 10 years. Unfortunately, their words were discounted to a certain extent by a public that desperately wanted to believe differently.

Who is so naive as to argue that we have in this country a monopoly on scientifically trained personnel? We do possess in atomic fission a four-year start, an industrial might second to none, and a relatively large group of highly trained, experienced scientists and technologists who are specialists in the field of atomic energy—but we have no monopoly of scientific manpower and never did! Unfortunately, this fact has not been clearly understood and has

influenced the thinking and therefore the actions of many to the detriment of the atomic energy program generally.

Two questions are now paramount in the minds of all:

What exactly does Russia have in the way of atomic weapons?

Will Russia's unlocking of the energy within the atom lead to peace or war?

Frankly, we can only speculate as to the first question. The second is of long range significance, far more important than the first and the final answer depends upon several presently unknown factors that will only be disclosed as the pages of history are written.

The immediate reactions to President Truman's announcement essentially can be described as constituting two schools of thought diametrically opposed to each other. There are those who believe that possession of the knowledge of atomic fission and the atom bomb on both sides of the Iron Curtain will result in a neutralizing influence on both, similar to the situation in gas warfare during World War II; the other school believes that unless immediate steps are taken to achieve international control on a basis acceptable to the western powers, the United States, and Russia eventually will plunge the world into a third world war and once war becomes a fact, atomic bombs will be employed along with every other form of weapon of destruction.

Whether we lean on the balance of power thesis or fear the ultimate result of an armaments race, we must renew our efforts to obtain international agreement on an equitable basis despite the disappointing failure of the past few years. Unfortunately, such an agreement represent a change of approach on the part of Soviet Russia, concessions she has steadfastly refused so far to make. That she will be willing to do so now that presumably she has developed an atom bomb is a slim hope, but no effort to create a conciliatory attitude is too great, provided it does not compromise the

basic tenets (1) that all nations receive the potential benefits of man's new knowledge; (2) that the methods of international control guarantee the freedom and safety of all nations.

Such guarantees or agreements must be more than mere promises, however; and must include a practical approach to questions of inspection and control of all atomic developments in every country of the world. Paper treaties alone guarantee no real security. We stand at the brink of a momentous decision in history. Either mankind moves forward or resigns itself to the likelihood of almost complete annihilation and a rapid return to the Dark Ages.

As scientists and technologists we cannot but speculate concerning the reactions of our brother scientists and technologists in Russia as they contemplate the possible use of atomic fission for the destruction of civilization. Unfortunately, we have no means of free communication with them. Is there in Russian scientific circles, now that they too have solved the greatest mystery of the physical universe, the same outspoken sentiment favoring adequate international control of atomic energy that has characterized the utterances of physical scientists of this and other countries?

In 1947, following the meeting of the International Union of Chemistry and the Congress of Pure and Applied Chemistry held in London, we stood before the League of Nations' building in Geneva. A few days later we stood in The Hague viewing the outward sign of an earlier attempt at international agreement. Just a few days ago we passed the rapidly growing pile of steel and masonry that is to be the future home of the United Nations Organization in New York City. Will some future editor of CHEMICAL AND ENGINEERING NEWS and INDUSTRIAL AND ENGINEERING CHEMISTRY stand before the stately physical structure of a defunct United Nations tortured by the same thoughts that

prevailed in my mind in Geneva and The Hague, or will he recall in the sight of these buildings not only the feeble attempts of men to cooperate once more after two dismal failures, but the final glorious achievement of mankind's most noble objective-lasting universal peace?

We can think of no better way to conclude han to reaffirm the sentiments expressed in the editorial pages of *Industrial and Engineering Chemistry*, September, 1945, approximately one month after the release of the knowledge that man had at long last solved the riddle of the atom :

The frail flower of peace is now susceptible to a neutron. The world of science has brought to the world at large a strange and almost incredible power. It can kill, it can destroy the very civilization that made possible its unleashing, or it can be to that same civilization

the gift of the ages, the veritable key to the universe. Utter annihilation, or untold benefit can flow from man's unlocking of the force of atomic energy.

The need of the hour, the year, the generation, and the century is intelligent understanding of the forces that have been unleashed, an unflagging determination on the part of every man, woman, and child to share the moral responsibility of seeing that the new power which man has at long last achieved is used solely for the advancement of mankind — not its annihilation.

Now, if ever the principles and philosophy Golden Rule must be accepted, must triumph in man's mind, and must govern his actions. It is civilization's last chance.

There is no peace other than the peace that resides in the hearts and mind of men.

## NOTES AND NEWS

### Award by Unesco

THE IMPETUS, the new monthly magazine of the UNESCO is putting up for discussion each month, an open question in the field of reconstruction and development. For the best letter discussing the question, *the Impetus* will send the writer an International Unesco book coupon for 10 dollars, good in any book store in the world. Letters should not exceed 200 words in length. The open question for October was "Should the United Nations undertake the Economic Development Scheme while need for re-construction still exists in war-devastated countries".

The *Impetus* will also award an International book coupon for 5 dollars for open question, which must be stated in 25 words or less and must have a direct bearing on some aspect of Educational, Scientific or Cultural development and reconstruction.

The entries for competition may be sent to the General-Secretary, Association of Scientific Workers of India, University Buildings, Delhi-2 or direct to the editor, *Impetus*, Unesco House, 19, Avenue, Klever, Paris.

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### Ionospheric Investigations at Calcutta

Ionospheric apparatus, made in Australia has been loaned to the Calcutta University by the Commonwealth Scientific and Industrial Research Organization in recognition of the research work carried out by the University in this field. At present most countries are conducting research into the conditions in the ionosphere—the region of the upper atmosphere, about sixty or seventy miles above the surface of the earth.

The apparatus will be installed at Harin-ghata, about thirty miles from Calcutta. The Indian Council of Scientific and Industrial

Research has made a grant of Rs. 80000/- for the construction of the field station. Calcutta University, in collaboration with the Indian CSIR, will train about a dozen students in the technique of ionospheric investigation each year.

*By Courtesy of the Australian  
High Commissioner's Office  
New Delhi.*



### **"Differences Between the Government and Industry Could be settled by a Little Research Work"**

Dr. S. S. Bhatnagar, Secretary to the Government of India, Department of Scientific Research while addressing the joint annual convocation of the Harcourt Butler Technological Institute and the Indian Institute of Sugar Technology at Kanpur, remarked that however distasteful the word "Research" might be to some, the present differences between the Government and Industry could be settled by a little research work. He suggested a round-table conference of a committee of the Cabinet with five or six top-most Industrialists when the problems of labour, transport, capital, raw materials, markets, paucity of technicians and lack of standardisation could be thrashed out. Dr. Bhatnagar further said that mere paper planning would not do; planning and executive action should go side by side.

While speaking of the technological development and industrial advancement needed for the country, Dr. Bhatnagar pleaded for legislation controlling the industries and for nationalisation of some of the more important strategic industries.

Referring to the role of scientists and technical men in the economic development of the country, Dr. Bhatnagar urged upon them to shoulder the responsibility for leading the country to prosperity, and while admitting that India did not lack qualified and trained personnel, he suggested that the Government should

immediately improve and expand facilities for scientific and technical education, research and training, and he sounded note of warning that if the steps were not taken with a sense of urgency to develop the training and research facilities on a scale commensurate with the needs of the country, the situation might well be beyond remedy.

"Every problem should be tackled in a rational, and not in an emotional manner, and political and religious doctrines should not be allowed to influence economic matters", remarked Dr. Bhatnagar and he asserted that science and research were capable of providing solutions to satisfy all concerned.



### **Unesco Links up International Research**

A pamphlet which gives an account of the international link-up between scientists for raising the standards of living in many parts of the world has just been published in Britain. Entitled "Scientific Liaison", it deals with the work of UNESCO's Field Science Co-operation Offices.

There are four of these offices at widely spaced points across the globe. They are situated in Latin America at Montevideo, in the Middle East at Cairo, in the East Asia at Nanking, and in South Asia in New Delhi.

Their activities cover a wide range of activities such as agriculture, soil conservation, health, sociology, bacteriology, genetics and general education. They also act as invaluable liaison points for promoting international scientific contacts and stimulating interchange of information, publications and specimens.

The work of these Field Science Co-operation Offices has been described as one of the most useful of the many activities sponsored by UNESCO. Technical help towards the economic development of those areas of the world whose potentialities have not yet been fully opened up is regarded as one of the most vital tasks now facing world science.

## LETTER TO THE EDITOR

### Danger in broken Flourescent Lamps

Sir,

It has become the fashion of the day to use flourescent tubes so as to give the room a pleasant, dignified and above all perhaps a glamorous look. In that way these lamps have outstanding advantages in shops and restaurants. The peak life of these tubes is more than 2000 hours and some imporved ones are rated upto 8500 hours as compared with the 1000 hours' peak life of a filament lamp. So, to effect economy, a housewife also finds it convenient without having to replace the lamp frequently.

Inspite of all these advantages these lamps may, however, prove dangerous and cost us much more than the economy and other business opportunities. There is of course no danger with the intact tubes but a broken tube, if handled carelessly causes poisoning of a serious nature when a cut injury takes place. In most cases it may even necessitate of the removal of the infected tissues by surgical methods. Reports of such cases have been given wide publicity in America and the USA Government and business houses have become alert to this and are trying to educate the public about the danger hidden in a beautiful tempting flourescent lamp. The New York City Sanitation department has ordered its refuge collectors to single out discarded flourescent lamps for kid glove treatment. The tubes are disposed off by burying under marshy land by bulldozers. The US Seamen are required to use gloves

and protective goggles while disposing of worn out tubes. Even the Insurance agents have been advised to warn the householders against this danger. The Association of Fire Chiefs in USA has recently issued a safety bulletin headed, "flourescent tubes contain an extreme poison hazard."

The phosphorus used in these tubes to flouresce and thus give off light, contain beryllium, to which the poisoning is due. In case the lamp socket is loose or defective, the tube may fall and shatter with a puff of phosphorus powder. In case of such accidents immediately the inmates of the room should go out until the dust has settled and while disposing off the broken pieces one must not touch them with finger. After wetting the dust the room should be swept with a broom or brush and the dust collected in a pan should be burried underground.

It is reported that a joint committee of the United States Public Health Services and the manufacturers of these tubes have recently agreed to substitute beryllium with 'Halo phosphor', the composition of which is perhaps a trade secret.

It is better that we enlighten the public in India about the inherent danger in the flourescent tubes and give wide publicity to the precautions to be taken while using them.

Yours etc.  
S. C. M.

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Council Delegates and Members are requested to collect their cards for the ensuing Council Meeting and the 3rd Annual General Meeting of the Association from their Branch Offices.

*General Secretary*

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## VIEWS

### Development of Science and Research Atmosphere in India

The Department is working under a great handicap for want of adequate recurring and non-recurring grants. There is no equipment worth the name in this Department for research. The Department is training students upto M. Sc. Standard in Physical, Organic and Inorganic chemistry and twelve students are engaged in research for which the facilities are meagre.

*Head of the Chemistry Department,  
Lucknow University.*

+

Teaching accomodation is inadequate and the grant given to the Department for purchase of books and periodicals is insufficient and it has not been increased though the Department has been enlarged in undertaking under-graduate teaching in statistics. The teachers in the Department should be encouraged to do research work and proper facilities should be provided for the purpose and they should be granted an extra allowance.

*Head of the Department of  
Mathematics and Statistics,  
Lucknow University.*

+

As far as possible research laboratories should be separated from teaching laboratories and the former undertake only post-graduate work. The personnel should be relieved of routine teaching work.

The posts of Research Assistants should be on a permanent basis with a graded salary. The present tendency among Research Assistants to regard their posts as jumping-off grounds for more lucrative jobs elsewhere should be discouraged.

University research laboratories in which notable advances to scientific knowledge have

been made, should receive special help from the Central Government and should if necessary, be treated as training centres on an All-India basis. This will also prevent wasteful expenditure involved in duplication.

*Department of Botany and Geology,  
Lucknow University.*

+

The existing conditions of work are not conducive to research. The remuneration paid to the research assistants and research fellows is ridiculously low and the laboratories are not well-equipped for advanced fundamental research work. The result is that these workers are always on the look out for suitable jobs and leave the institution at the first opportunity they get. The annual grant made by the University is hardly sufficient for the day-to-day expenditure required for the under-graduate and post-graduate work. The cost of the modern equipment is very high and consequently it has not been possible to obtain it.

In order to improve the conditions it is suggested that (1) suitable grant be made for obtaining apparatus for research (2) the scale of remuneration for Research Assistants and Research Fellows and Scholars be suitably enhanced. It may also be pointed out that the Scientific Man power available in the country should be utilised in the interest of the Nation by the re-employment of those workers who are reaching the age of retirement in the various Universities. Then alone experience of research will go a long way towards the production of good work and training of young scientific workers.

*Professor of Physics,  
Lucknow University.*

## ASSOCIATION OF SCIENTIFIC WORKERS OF INDIA

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**Object's of the Association :**

To encourage the most effective use of science and scientific methods for the benefit of the community as a whole

To protect and improve the status and economic conditions of scientific workers

**Membership of the Association :**

Is open to natural and social scientists of all grades, and their associates

**Subscription :**

Ordinary Members : 5/- p. a. Associate Members : 3/- p. a.

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