July 1965 Volume 3 no 1

Pugwash Newsletter

issued quarterly by the Continuing Committee of
the Pugwash Conferences on Science and World Affairs

P U G W A S H N E W S L E T T E R

Volume 3 Number 1 July 1965

Editor: Prof. J. ROTBLAT

8, Asmara Road,
London, N. W. 2, England

C O N T E N T S

	Page
Pugwash Events	1
Deaths of Acad. A. A. Arzumanian and Prof. V. Husa	2
Report of Working Group 3	3
Abstracts of Papers presented at the 14th Pugwash Conference in Venice	
A. Papers concerned with International Co-operation	7
B. Papers concerned with Disarmament	12
C. Papers concerned with Biological Warfare . . .	14
Alan and Hannah Newcombe A New Start in Vietnam	19
Recent Books	24

P U G W A S H E V E N T S

15th PUGWASH CONFERENCE

The 15th Pugwash Conference will be held in Addis Ababa, Ethiopia, from the 29th December, 1965 to the 4th January, 1966. The Conference will be sponsored by the Haile Selassie I Foundation.

The title will be "Science in Aid of Developing Countries" and about 70 participants are expected to attend. Considering the theme of the Conference, the Committee decided that the majority of participants should come from the developing countries. The geographic distribution of those to be invited is approximately as follows: 6 each from the U.S.A. and U.S.S.R.; 4 each from China and the U.K.; 3 each from Ethiopia, India and the U.A.R.; 2 each from Australia, Brazil, France, Ghana, Israel, Japan, Nigeria, Pakistan and Poland; 1 each from Afghanistan, Algeria, Argentina, Burma, Ceylon, Chile, Colombia, Congo, Cuba, Czechoslovakia, Ethiopia, East Germany, West Germany, Greece, Indonesia, Italy, Kenya, Malaysia, Mali, Mexico, Morocco, Philippines, Puerto Rico, Sierra Leone, Sudan, Sweden, Tanzania, Thailand, Tunisia, Uganda, West Indies and Yugoslavia.

The preliminary programme for the Conference is given below. This provides a broad outline of the work of the Conference and it is intended that some of the topics should be studied in greater detail. This will be decided at a preparatory meeting to be held some time before the Conference.

Agenda

1. Education in Developing Countries
   - (a) Planning of education at all levels and the balance between elementary and higher education.
   - (b) Training of scientists and technical personnel.
   - (c) Training of personnel for economic development.
   - (d) Development of the academic spirit.

2. Organization of scientific institutions and research in developing countries
   - (a) Optimal forms of organization of scientific research.
   - (b) Regional co-ordination of scientific institutes.
   - (c) Regional co-operation in technology.
   - (d) Exchange of scientists between developed and developing countries.

3. The scientific approach in aid to developing countries
   - (a) Methodology of problems of co-operation: definitions and priorities.
   - (b) Methods of transfer of experience from developed to developing countries.
   - (c) Scientific analysis and planning of economic and social development.

(d) International network of scientific research.
(e) Participation of scientists from developing countries in international scientific programmes.

4. Specific problems of developing countries

(a) Urgent economic, political and social problems.
(b) Problems of population growth.
(c) Problems of resources: food, water, energy, etc.
(d) Other projects.

5. Problems of security of developing countries

(a) Means of reducing the burden of armaments.
(b) Problems of disarmament and world security in relation to developing countries.
(c) Collective security arrangements.

16th PUGWASH CONFERENCE

The 16th Pugwash Conference under the title "Disarmament and World Security, particularly in Europe" will be held in September 1966 in Poland. A preparatory meeting will probably be held in Jablonna near Warsaw, and the Main Conference will take place in Sopot on the Baltic Coast.

PROCEEDINGS OF THE 14th CONFERENCE

The Proceedings of the 14th Conference which was held in Venice from 11th to 16th April, 1965, are now being printed and it is hoped to distribute them within the next few weeks. In the meantime this issue contains the report of Working Group 3 and abstracts of most of the papers presented at the Conference.

DEATHS OF ACAD. A. A. ARZUMANIAN AND PROF. V. HUSA

Academician Anushavan Agafonovich Arzumanian died in July at the age of 61 after a long illness. He was Director of the Institute of World Economy and International Relations in Moscow, a member of the Praesidium of the Soviet Academy of Sciences, and the Head of the Department of Economics of the Academy. By virtue of this post he was naturally interested in the Pugwash Movement in which he took an active part. He participated in the 6th Conference in Moscow and in the 11th Conference in Dubrovnik. He also took part in the work of the Continuing Committee.

Prof. Valchar Husa died recently at the age of 59. He was a Corresponding Member of the Czechoslovak Academy of Sciences and Professor of History at the Charles University in Prague. Professor Husa participated in the 6th and 10th Pugwash Conferences, and was one of the initiators of the Pugwash Group in Czechoslovakia.

14th Pugwash Conference - Venice 11th to 16th April, 1965

REPORT OF WORKING GROUP 3

INTERNATIONAL CO-OPERATION IN SCIENCE EDUCATION

We agree on the following bases for our consideration of the problems of science education:

1. We live in a world of rapidly accelerating change, of change brought about chiefly through the discoveries of science and their application in technology.

2. General education in this day and time must be primarily concerned with the adjustment of men and of societies to change in ways of life.

3. In particular, such education must concern itself, among other things, with the role of science in human life, both with the changes to be expected on account of the advancing front of scientific knowledge and its applications, and also with the nature of scientific investigation itself, which is the main force impelling change.

4. The increase of scientific knowledge is at present proceeding exponentially, with a doubling time of approximately ten to fifteen years. The useful lifetime of most scientific textbooks is currently about equal to that of an automobile (5-10 years), and the obsolescence of a trained teacher of science, lacking renewal of training, covers about the same span of time.

5. These truisms require implementation in public policy, with respect to efforts to improve science curricula, with respect to the training and renewal of training of teachers, and with respect to the general education of all citizens.

From these premises it follows that the task of revising and reforming our educational programmes and methods is urgent and will need to be carried forward continuously. In this task international co-operation is particularly needed in order to convey to those engaged in each country the advances made by those in other countries and to prevent them from making the same mistakes.

We are deeply convinced that the future progress of science depends upon effective education in science, fully as much in the secondary and elementary schools as in the universities. The older and more mature a student is, the easier for him to advance on the basis of his own study and motivation. In the early schooling, however, an enduring interest in science must be generated, curiosity must not be thwarted by rote learning, and the true nature of scientific investigation must be disclosed. There will be far too few scientists and teachers of science in all our countries unless these needs are met, and unless more scientists cooperating in all lands grant this objective a high priority in their professional lives.

I.

We believe that more attention must be given by scientists to the need for revising and reforming the science curriculum in order to keep it sound and broadly based, yet at the same time flexible and experimental in nature.

Scientific societies, in all countries, should take a far more active part in the reform of science teaching. University research scientists should always work with selected science teachers when preparing textbooks, laboratory experiments and demonstrations, and other materials for use by students at lower levels of the school system.

Countries will differ in the emphasis they should properly place on various aspects of the science curriculum. Some will prefer to emphasize the nature of scientific investigation and discovery. Others, in the light of their practical problems, will emphasize in particular those aspects related to health and disease, to nutrition and agriculture, to developing industry and to the relation of population to resources. Neither emphasis, of course, should be exclusive.

There are serious difficulties in initiating such changes. Lack of laboratory facilities encourages stereotyped, authoritarian teaching of science instead of an investigative, experimentally oriented treatment. Lack of emphasis on the international and historical development of science as a part of human cultural history prevents the study of science from encouraging, as it should, the spirit of mutual tolerance and peaceful co-operation among nations. In many countries the dead hand of required examinations prevents adoption of modern up-to-date science programmes.

A proper development of education in science can greatly enlarge the public understanding of science as a tool of human progress and a bond between nations.

We have agreed that among developed nations the simplest and least expensive form of international co-operation in science education consists of two simple steps:

(a) the development of mechanisms for prompt, regular transmission of the products of curriculum studies prepared in one country to interested groups in all other countries; and

(b) the payment of expenses to enable experienced personnel from one country to accept invitations from active science education groups in other countries to visit and assist them.

In respect to (a), each country and each working team should be free to translate and adapt the products of other groups, and to use much or little as seems fit. In respect to (b), very brief visits by personnel are less useful than active joint working sessions of some weeks to months in duration.

The developing countries have special problems in this area because of their great shortage of trained scientists and science teachers. Regional groups of such countries may profitably unite in developing new science courses for the elementary and secondary schools. We commend the programme of U. N. E. S. C. O. in developing pilot studies for physics teaching in Brazil, chemistry teaching in India, and prospectively for biology teaching in Africa.

We recommend that at the 15th Pugwash Conference on Science and World Affairs to be held in Addis Ababa, special attention be devoted to the subject of science education in developing countries, and that assistance be requested from U. N. E. S. C. O. for preparatory work and wide attendance of representatives of the developing

countries to discuss these problems.

We further recommend that the pilot projects of U. N. E. S. C. O. in Brazil (physics), in India (chemistry), and in Africa (biology) be pushed with speed and urgency, and be extended as soon as possible on a more comprehensive scale.

II.

A greatly reformed training of science teachers and their retraining at periodic intervals are necessitated by the rapid advances of science itself. We are in agreement about the need for the primary training to be based largely on the subject matter, whether humanistic or scientific, rather than on pedagogy. However, we emphasize the great importance of breadth of training, especially for elementary and secondary school teachers; and equally we emphasize that the sciences must be integrated in general education. The teaching of the sciences must, therefore, include the role of science in the development of civilization. At the same time the humanistic and social studies must undergo a change to include the history of scientific developments, and modern logic and methodology of science. The relations of the sciences to the arts must be stressed.

The renewal of the teachers' training at periodic intervals must be provided by specially planned institutes, seminars and summer courses. Some countries have scarcely embarked on this absolutely necessary part of teacher training. We foresee that large expenditures may be necessary, since one-fifth of the teachers may be involved during each year, and not only the staffs but also the trainees will require adequate compensation.

Measures must be devised to make the renewal of training universal among science teachers, and yet to allow it to be undertaken freely and willingly. We have discussed these measures, but believe that far more attention must be given to the problems involved.

We recommend that U. N. E. S. C. O. and other agencies be asked to form a permanent study group to consider and devise such measures and to communicate them to all governments. We also recommend more vigorous actions to encourage and support joint studies and joint programmes relating to the training and renewal of training of science teachers.

III.

The recruitment of science teachers is inadequate in all countries, and in some countries is desperately low. In nearly all countries teachers are seriously underpaid. Better salaries, leading to higher social standing, active recruitment of future teachers by university scientists, many of whom in the past have neglected this matter, and especially a reduction in the daily load of classes to be taught and subsidiary duties to be performed may be recommended. The cost will naturally be high, because ideally recruitment must allow not merely for maintenance of a teaching force able by arduous struggle to supply science education for all future citizens - it must also enlarge the teaching force, if hours of duty are to be reduced and if extra time is allowed for the preparation of laboratory and field studies, for renewal of training, and for enlargement of scientific understanding of the teacher. Especially in the developing countries, where science teachers are in very short supply, corps of science teachers acquainted with modern methods of science teaching and modern curricula should be organized on a multinational

basis to assist in teaching and in training of teachers.

The problems of recruitment of science teachers can be profitably analysed in international conferences and study groups such as those recommended for establishment in the previous section, on teacher training.

IV.

It is evident that human society is based on utilization of a diversity of types of individuals. Individuals superior in certain respects may not be exceptional in others. The best society will be that in which every type of individual finds fullest realization of his capacities and meets the fullest opportunity to utilize them. Types of persons differ genetically as well as through training, education and culture. There will be no peace among nations until we have learned not only to tolerate but in fact to esteem these differences between ourselves and others.

The study of science is particularly able to teach the lessons of tolerance and appreciation of differences. Science itself is international in scope and cannot flourish in secrecy or within arbitrary boundaries. It must then be taught that scientific advances depend upon men of many nations, languages and traditions, united in their allegiance to scientific ideals. The gifts of health and power brought to mankind by scientific discoveries must be impartially attributed where due. Students of one country may justly be proud of the contributions of their compatriots, but they must never be allowed to suppose that all great discoveries were made within their own national borders. Teachers must, therefore, learn a true history of science, avoid chauvinism, and emphasize the role of science in preparing for a disarmed, peaceful world in which peoples of all countries and all races will be respected and admired for their contributions to human welfare.

V.

We believe that in a peaceful, disarmed world, education will have the first priority in the budgets of the nations and first claim on the quality and quantity of manpower.

We believe that even now all nations should reconsider their apportionment of funds and manpower and should allocate far more to education. Science education, as an integral element in general education, like the skeleton within the human body, supports and gives form and power of movement to all else. There will be no future scientists without able, devoted and magnetic teachers of science today. There are not enough of them. Yet there could be many more if funds and manpower were properly allocated to education.

As disarmament proceeds, the liberated funds now devoted to military defence should be shifted with highest priority to the improvement of education. But even if disarmament is not successfully initiated in the near future, this high priority of education for funds and manpower should be respected. A generation better educated in science and in tolerance will lead mankind toward lasting peace.

ABSTRACTS OF PAPERS PRESENTED AT THE 14th PUGWASH CONFERENCE IN VENICE

A. Papers concerned with International Co-operation

H. Alfven

THE SWEDISH PLAN FOR AN INTERNATIONAL PEACE RESEARCH INSTITUTE

Tentative ideas on the form which the Swedish Peace Research Institute may take are set out in an attempt to stimulate comment and criticism. Following the guidelines laid down by the Swedish Government (listed in an Appendix) the preliminary committee emphasizes the necessity for an international character in the Institute, with financial support by, but independence from, the Swedish Government. Multifaceted problems related to disarmament are favoured, but the relative proportions of research and teaching in the programme are still a matter for discussion. There will be close consultation with other groups working on conflict research, particularly with Pugwash and the International Peace Research Association.

Harrison Brown

SCIENCE INFORMATION ACTIVITIES OF THE INTERNATIONAL COUNCIL OF SCIENTIFIC UNIONS

The rapidly increasing need for international co-operation in the collection, assessment, storage and retrieval of scientific data has led I. C. S. U. to take an active part in the programme in four main fields described in the paper. I. C. S. U. has special committees concerned with the collection and assessment of International Critical Tables of Numerical Data in Physics, Chemistry and Technology. It co-ordinates with World Data Centres, which are supported by national organizations, endeavouring to collect complete data for safe-keeping, for accurate reproduction and for supply to other W. D. C. 's. A specialist group in the Federation of Astronomical and Geophysical Services is concerned with supporting the collection of data on a permanent basis in these particular fields.

Since 1952 I. C. S. U. has had an Abstracting Board charged with organizing and promoting on an international scale the exchange and publication of primary and secondary scientific information in the fields covered by the members of I. C. S. U. There is an emphasis throughout the paper that the problem of exchange of scientific information can only be tackled on an international basis and that the I. C. S. U. meetings are orientated to this goal.

G. Burkhardt

COMMENTS ON SCIENCE EDUCATION IN AFRICA

Calling on his experience from 6 months as a visiting professor in the University of Ghana, the author shows the vast discrepancy between the two science teachers per year produced by the universities locally, compared with the 2,000 per year that are needed. There is, at present, no trend towards science and technology as a subject of choice among the African students. Encouragement to increasing the proportion of science could be given by post-graduate student scholarships; 2-year visiting professorships from the more advanced countries; and an attempt to institute a multilateral, in preference to bilateral, aid for the development of science. Pugwash scientists have the ability and duty to encourage young scientists to spend at least 2 years teaching and doing research in developing countries; this should perhaps be done in co-operation with U. N. E. S. C. O.

A. A. Buzzati-Traverso

THE CASE FOR INTERNATIONAL SUPPORT OF SCIENTIFIC RESEARCH

Scientific talent is perhaps the most valuable natural resource of the human race, and there is no evidence that it is concentrated in a few nations. Therefore, it is to the advantage of all that research should be supported on an international level. Even the scientifically well developed nations (the U. S. and the U. S. S. R.) need co-operation since they do not necessarily excel in all fields, and the large but undeveloped nations (India, China) need contacts in order to fulfill their great potential. European nations, once the leaders, need co-operation to regain their position. C. E. R. N., Euratom and E. M. B. O. can be cited as a good start toward the over-riding of national interests.

In addition to the general need for co-operation between nations, there are two other reasons for support of research on the international level - one positive and one negative. The positive is the fact that modern nations spend large amounts on science and must justify these expenditures on the grounds of large programmes. Since a sound programme requires a number of different competences, the scale of the plan should be large and no apology is needed. A negative reason is that if research is supported on a national scale, too much power is given to committees of poorly qualified people, or to committees composed of scientists with an axe to grind.

The United States have been very generous in support of foreign scientists. Since World War II the United States government has been the largest contributor to the development of European biology, with over 500 grants per year to scientists of Western

Europe and the Middle East, through the National Institutes of Health. The Rockefeller Foundation is another outstanding example. Even if the other nations had had their own money to invest - the equivalent of what they received from the U. S. - the results could not have been as good, for administrations of funds at a national level must be less efficient, and surviving projects have certainly faced less competition. American support of European biology could be a model for the establishment of a supranational fund for the support of science.

S. F. Edwards

SCIENTIFIC COMMUNICATION

The problem of scientific communication is discussed by considering (1) the present situation; (2) the problems existing; (3) the solution at present adopted in the world; and (4) a new solution to the problem which contains several concrete suggestions which could be supported by the Pugwash Conferences since they will need international organizations to carry them out.

Bentley Glass

THE TRAINING AND RENEWAL OF TRAINING OF SCIENCE TEACHERS - A CRUCIAL PROBLEM

The rapid rate of development of science and technology requires a revolution in the methods of teaching science, science teachers and in the retraining of science teachers. This necessity must be met rapidly by international co-operation to allow for rapid accumulation of experience, and criticism of schemes put forward in detail, such as that outlined in the paper for the teaching of biology in the United States. As well as the initial education in science and its implications, facilities for retraining of science teachers are essential to prevent their obsolescence within 5 years, and to allow for the full participation of science in the sociological development of society. U. N. E. S. C. O. should be strongly urged by Pugwash to take a more active role in the field through its present programme which, although aimed at the right end point, is inadequate to meet the urgent need.

Bentley Glass

INTERNATIONAL CO-OPERATION IN DEVELOPMENT OF NEW SCIENCE CURRICULA

Although detailed curricula for science subjects must be adapted to local conditions, or social, educational and economic environments, examples are given of the acceptance of the U.S. programme for teaching of the biological sciences in many countries in the Organization of American States. Similar experiences have been recorded for programmes in the teaching of physical sciences. It is stressed that the emphasis in developed countries could be on the exploration and discovery in science giving mainly long-term benefits, whereas in the developing countries stress must be on more immediate returns from science and technology to solve urgent practical problems.

I. Malecki

KEY PROBLEMS OF THE DEVELOPMENT OF SCIENTIFIC RESEARCH IN THE DEVELOPING COUNTRIES

The paper suggests the following problems of research organization in developing countries as subjects for discussion at the Pugwash Conferences: (1) ways to narrow the gap between advanced and developing countries; (2) role of basic research in economical and cultural development; (3) feed-back between political behaviour and research development.

A preliminary analysis of these problems is given.

I. Malek

REMARKS ON SCIENCE EDUCATION WITHIN THE CONTEXT OF INTERNATIONAL CO-OPERATION FOR PEACE AND DISARMAMENT

The rapid advance of science and technology calls for a revolution in the methods of education. On an international scale, funds should be channelled towards developing education along the lines of exploiting potential and latent talent in all children, rather than, as at present, teaching preconceived facts in preparation for future employment. A new approach and new techniques are needed, and a special Pugwash Study Group on education is suggested.

E. Rabinowitch

PROPOSAL FOR THE ESTABLISHMENT OF A UNITED NATIONS COUNCIL ON SCIENTIFIC CO-OPERATION

International co-operation in science and technology, particularly for the benefit of developing nations, offers one field of possible advance in East-West co-operation and rapprochement. With power contest deadlock and disarmament programme stymied, this field acquires increasing importance. While a number of U. N. (and other) organizational structures exist for this purpose, it is still considered secondary in comparison to other, more traditional aspects of international relations. The paper suggests that in the same way in which the importance of international economic co-operation is recognized by the existence of E. C. O. S. O. C., that of scientific and engineering co-operation should find its expression in a U. N. Council on Scientific and Technological Co-operation, providing a high-level co-ordination organ for existing organizations such as Special Fund, U. N. E. S. C. O., W. H. O., etc.

A. V. S. de Reuck

INTERNATIONAL CO-OPERATION IN SCIENTIFIC INFORMATION SERVICES

The fundamental importance to scientific research of an efficient flow of information is outlined and collaborative measures on an international scale are suggested which would reduce the increasing congestion and inefficiencies of present methods of communication. Specific recommendations are limited to measures considered to be feasible at the present time. These include: (1) Internationally agreed rationalizations of primary and secondary publication, such as the application of a Code of standards of refereeing and editing to journals and the complete coverage by abstracting journals of primary publications which conform to this Code. (2) The encouragement of co-operative efforts as the mechanization of information retrieval develops, to prevent wasteful duplication in the preparation of abstracts and indexes (3) The encouragement of nationally organized guides to information sources (such as referral centres and printed directories) and the establishment of an international clearing house to co-ordinate information about such sources. The Working Party which prepared this paper recognizes the partial nature of its proposals but feels that immediately implementable measures would provide a foundation for further and larger scale co-operative initiatives, and that such action must in any case be based on more research on documentation techniques. An Appendix on Documentation Research stresses the importance of (1) research on man-machine interaction, essential for the development of efficient use of mechanized information systems, and (2) the evaluation of actual information needs. Progress will ultimately depend on the increased

recruitment of scientists into this field. The Working Party also recommends the collection and dissemination of the results of such research by an international clearing house and by publication of guides to work in progress.

B. Papers concerned with Disarmament

V. M. Khvostov

CURRENT STATUS OF DISARMAMENT PROBLEMS

The cause of disarmament is making no progress whatsoever. The reason is that a war is now raging in Vietnam, which involves the use of chemical weapons, banned by international law. The process of remilitarization of West Germany threatens to enter a new phase. Projects have been elaborated and are being discussed which would allow access to nuclear weapons to the Bundeswehr and the Bonn government, the only government which officially declared the necessity to change the existing borders in Europe.

Some U. S. political leaders believe that West Germany will be completely satisfied with her role in the planning and control of M. L. F., leaving to the Americans the right of veto. Actually, West Germany will never put up with the American veto over the use of the warheads when the M. L. F. is created. By enabling West Germany to keep a finger on the safety catch of the nuclear missiles, the U. S. practically contradicts its own declarations about the reduction of international tension and improvement of relations with the U. S. S. R.

This course of action is threatening to foil completely all international disarmament negotiations, since it is impossible to put forward proposals on disarmament and at the same time allow such revenge-seeking elements as the Bundeswehr generals to have access to atomic weapons.

With regard to the state of disarmament negotiations themselves, the Soviet Government has been very co-operative in tackling the disarmament issues and has repeatedly introduced amendments into its draft disarmament plan, which took into account the points of view of the Western powers. In his report the author gives a detailed list of all the steps the Soviet Government has taken to bring the positions of the parties closer together. On the other hand, the Western powers, and especially the U. S., are not willing to find ways to an agreement. All the difficulties involved in disarmament negotiations stem from the reluctance of Western powers to be co-operative and to make efforts to find a mutually acceptable agreement.

P. J. Noel-Baker

PROPOSAL FOR SMALL CONTINUING WORKING GROUPS ON ARMAMENT PROBLEMS

It was to arouse the nations of the world to the dangers of the nuclear arms race that Einstein, Bertrand Russell, Max Born, Joseph Rotblat and others called the Pugwash Movement into being. Yet ten years after their appeal, it is still true that the Heads of Governments do not ponder the facts of modern warfare as the daily Number One problem; on the contrary, they give them scant, casual and very rare attention. The average citizen is even less concerned; his apathy and ignorance are one of the strangest phenomena in the history of democratic societies.

Pugwash, therefore, has had a good deal less than full success in the chief purpose for which it was created. That is no reason for abandoning the purpose; it is a reason for trying new methods by which it can be achieved.

It is accordingly proposed that the Continuing Committee should invite small groups of highly qualified persons whose names will carry authority to prepare studies on the following subjects:

(a) The casualties, and physical damage to property, to the land, and to the oceans which might result from full-scale war with the so-called "strategic" nuclear weapons.

(b) Ditto from the use of "tactical" nuclear weapons in a land battle.

(c) The risks of accidental or unintended war due to:
  (i) mechanical failure of weapon control systems.
  (ii) human failure or mental breakdown of men in charge of the weapons.

(d) The value of Civil Defence.

(e) The value of anti-missile missile, or other active defence.

These studies should be as vivid as possible, and should be given the widest possible publicity.

J. Prawitz and U. Ericsson

A DETECTION CLUB

A system for a co-operative sampling and exchange of seismic data to meet small nations' need for verification of an underground test ban is described. The system is the one described in the 8-nation memorandum of 16 April, 1962 revised in the light of recent scientific and political developments. The data will be recorded at national and preferably advanced stations. They are proposed to be distributed by the meteorological telecommunication network. Analysis will be made by interested parties themselves. Inspection is not discussed. The data collection may rely on a few

States only, but all States will have the possibility to make independent seismic analyses with first class data.

H. Thirring

DRAFT PROPOSAL TO THE UNITED NATIONS CONCERNING INTERNATIONAL LEGISLATION ON DISARMAMENT AND COLLECTIVE SECURITY

Although general and complete disarmament is the recognized aim of the United Nations, the Geneva negotiations are at a deadlock.

A small but useful step toward general disarmament could be made if those among the neutral and non-aligned nations which feel secure enough to do so would start to disarm voluntarily.

There are mainly two reasons for the hesitation of states. One is the mutual mistrust and the old prejudice of an irresistible attracting force of a military vacuum. The other is the almost superstitious belief that the neutrality of a country could be recognized only if it were in a position to defend its neutrality by military force.

In order to remove the latter obstacle the author proposes to create by international convention "a privileged status" of a disarmed nation guaranteeing its security. Any aggressor against the disarmed state would be subject to the non-military punitive sanctions laid down in Article 41 of the U. N. Charter. Without war being declared against them, these states will be outlawed from all commerce and traffic with the rest of mankind and remain so until their troops have been withdrawn from the illegally occupied area and reparations are made.

A state wishing to disarm under U. N. protection notifies this intention to the U. N., whereupon a special commission examines: (1) whether the legal and political situation of said state among its neighbours makes unilateral disarmament advisable; and subsequently (2) whether its disarmament is actually carried out.

In case of a positive result of both examinations the privileged status of a disarmed and U. N. -protected nation will be conferred on that state.

C. Papers concerned with Biological Warfare

R. Goldwasser

MICROBIOLOGICAL IDENTIFICATION TECHNIQUES IN INVESTIGATIONS OF ALLEGED USE OF MICROBIOLOGICAL WEAPONS

Two groups of methods are described for the investigation of an established or anticipated infection from biological weapons. When an infection is already established, conventional long-term methods of identification at a cen-

tral laboratory set up for this work are feasible. The main technique for anticipated infection is in fluorescent antibody techniques. These give rapid diagnosis for infections from protozoa, bacteria, fungi and viruses. It is suggested that a laboratory equipped to carry out FA techniques should be established within the framework of the U. N.

C. -G. Hedén

THE USE OF EXISTING INTERNATIONAL CHANNELS FOR GUARDING AGAINST MILITARY APPLICATIONS OF NEWLY ACQUIRED MICROBIOLOGICAL KNOWLEDGE

The microbiologists have always been linked by powerful international organizations and have an inclination for international co-operation. The Section on Documentation of the International Association of Microbiological Societies (I. A. M. S.) might well assume the responsibility for working out such programmes which would retrieve information of special MW-significance. Such information, as well as the results of special reviews regularly performed by the other Sections, might then be considered by the Executive Committee of I. A. M. S. and submitted to the "Consultative Group on Biological Hazards to Man" which has been set up by the International Union of Biological Sciences (I. U. B. S.). The Consultative Group could also serve as the receiver for reports on new results, which the individual scientist finds disturbing from the point of view of MW-applicability. A general review is made of international organizations involved in biological control, and it is pointed out that the large scale facilities required for production and field testing might easily be employed in connection with MW. The function of U. N. E. S. C. O. , F. A. O. and W. H. O. in relation to microbiology is discussed and the place of the Security Council in the pattern of organization is defined. It is regarded as the proper "triggering" level for any international commission set up for the purpose of studying cases of MW-allegations. Finally, it is pointed out that there are strong forces operating in favour of a division of labour in the form of regional and international co-operation. The size of the problems raised by defence against biological warfare might force the smaller nations to consider international or regional centres for this area.

C. -G. Hedén

THE POSSIBILITY OF USING A MECHANIZED DOCUMENTATION CENTRE TO PROVIDE DATA ON THE BASIS OF WHICH INSPECTIONS CAN BE PLANNED

By means of collecting and analysing a department's or an institute's total output of scientific and other publications, and at the same time recording

the competence and activity of the personnel, an overall picture of the laboratory's goals and research intensity can be obtained which can be very revealing. It is regarded as essential that any nation adhering to an agreement aimed at the control of MW should be required to submit all printed matter (articles in papers and periodicals, protocols from hearings, official declarations, motions and propositions, calendars, catalogues, membership lists, progress reports, etc., plus scientific and popular papers, reports and reviews in journals and books) to a central agency. This might also store the data for any materials accounting (fermentors, glovecabinets, autoclaves, UV-tubes, certain media ingredients, vaccines, and biologicals obtained from pathogens, primates etc.) required for control. A continuous analysis would provide a sound basis for planning inspections. However, psychological and other obstacles will probably make an analysis impossible until a structure emerges in international organizations which can operate with a high degree of security based on a kind of loyalty which over-rides national considerations. Without security regulations the intelligence work might actually increase rather than decrease international tensions; perhaps it would even be a factor in disseminating MW-capability. Since an intelligence effort can hardly be undertaken at the present time, every effort should be made to develop an efficient "open" system for documentation in bacteriology, virology and immunology. Such an effort is already under way within the Section for Documentation of the International Association of Microbiological Societies. If an intelligence effort will not be possible later and if on-site inspections cannot be arranged, a system of "free circulation of microbiologists" might be considered. Eventually a double passport system signifying international responsibility as well as national loyalty might have to be devised.

M. Kaplan

DEFINITION OF DEFENSIVE AS OPPOSED TO OFFENSIVE WORK ON MICROBIOLOGICAL WEAPONS

Appraisal of this possibility is undertaken in terms of a possible pilot inspection scheme. The difficulty of drawing a strict demarcation line between potential defensive and offensive aspects of research and development on microbiological weapons is shown by the wide spectrum of possible activities in microbiological research that cannot be identified in such a way, e. g. studies in microbial genetics.

Any approach by an inspection team would require attacking non-sensitive areas of work covering the middle spectrum of possible activities such as research and production of vaccines, antisera, etc. Collaborative research on diagnostic problems would help to increase mutual trust and confidence.

M. Kaplan and K. Raska

INSPECTION FOR ALLEGATIONS OF USE OF MICROBIOLOGICAL WEAPONS

The question is examined as to whether or not the creation of a mechanism for inspection of allegations of MW attack would be beneficial or harmful. The various possibilities are weighed and it is concluded that in balance, an inspection mechanism would act as a deterrent. The limitations of inspection procedures now available are discussed and the need for improved epidemiological information in all parts of the world is stressed. Finally, the technical and political difficulties of setting up an international inspection team are reviewed.

O. Maaløe

ON THE PROBLEM OF DECLASSIFICATION OF BW RESEARCH

As far as the public is concerned, the response to the use of chemical or biological weapons is emotionally the same. On the tide of this emotion it may be possible to institute a system of declaring programmes concerned with the testing and development of biological agents with military potential. This would be particularly practical in countries which declare that their activities in BW are only for defensive measures. Such a method should be made on an international scale, before the propaganda of the humaneness of chemical warfare becomes effective. The experience of a voluntary inspection scheme conducted by countries in the Western European Union indicates that such a system of voluntary declaration of activity and inspection is a feasible method for detecting violations of any agreement not to develop and manufacture biological weapons.

H. Marcovich

CONTROL OF BIOLOGICAL WEAPONS

The problem of control of biological weapons seems, at present, much less difficult to solve than that of conventional and nuclear weapons. Biological weapons have probably not yet reached the stage of technical breakthrough in development to make them acceptable to the military as tactical weapons; nor can they be manufactured with facilities different, at least in quantity, from the needs of microbiological research. A mutual inspection scheme based on the experience of the Western European Union which has carried out 325 inspections over the past 8 years, is suggested. The first stage towards this should be a central record of laboratories using the few strains of toxins suitable for bio-

logical warfare, and the personnel involved. If a basic discovery were made on these strains, or in any other type of biological material, such as an increase in effectiveness covering several orders of magnitude, a warning of the implications should be given to others working under similar conditions. Thus, with the loss of secrecy in microbiological research, and co-operation on a system of mutual inspection by a team of three experts, the development of significant weapons of biological warfare would be decelerated.

M. Meselson

A PROPOSAL TO INHIBIT THE DEVELOPMENT OF BIOLOGICAL WEAPONS

The full potential of biological weapons may be realized by further development and a technical breakthrough. A proposal is outlined for inhibiting such a development by a mutual agreement to be undertaken as a pilot scheme among a group of smaller powers representative of Eastern, Western and non-aligned nations. It would be based on a declaration by each state that it is not developing biological weapons, the establishment of a control commission, and co-operation and exchange of personnel, information and research between the states concerned. The details of such an agreement would be explored by scientists from each state, who, after gaining experience of the requirements of such a scheme, could make an official approach to governments. Details of a proposed agreement, and its rationale, in terms of national defence policies, are outlined.

K. Raska and M. Kaplan

DISARMAMENT IN MICROBIOLOGICAL WARFARE FOR SMALL POWERS THROUGH INTERNATIONAL GUARANTEES OF ASSISTANCE IN CASE OF ATTACK

Smaller powers would find it easier to participate in disarmament in BW if given guarantees of assistance by larger powers. Specific points are outlined as to what such an arrangement would involve. These include the precise enumeration of diseases affecting man, animals and plants within a country, abandoning work on exotic diseases and provisions for assistance in case of attack or a threat thereof.

Alan and Hannah Newcombe *

A NEW START IN VIETNAM

Introduction

The background history of the present crises has been given in many places by many observers. Good recent summaries are contained in the "Background Paper on Vietnam" published by a Study Group of the Victoria Branch of World Federalists of Canada[1], and in a study by Arthur Larson (former adviser to President Eisenhower) and Don Larson[2]. Both studies indicate that the U. S. position is vulnerable from the viewpoint of international law; such studies should certainly be seriously considered, at least as correctives to the U. S. White Paper on Vietnam[3] and the Canadian Minority Report of the International Control Commission[4] which put the chief blame on North Vietnam. (For convenience, we use the terms "North Vietnam" and "South Vietnam", although they are really parts of the same country).

However, perhaps the time has come to close the book on recriminations about the past, and concentrate attention on possible solutions for the future. "Never mind who started it; how can we end it?" Since this is the main theme of this submission, we deliberately refrain from assigning blame for past and present actions by anyone; not that such blame does not exist, but that it seems unconstructive at this time to point it out, when this has been ably and amply done in many other publications.

There are many policy choices available to a government seeking to mediate in the Vietnam crisis; many of these choices are unacceptable for various reasons, for example at one extreme one could recommend that the Americans should withdraw completely from Vietnam; this choice is unacceptable in that such a recommendation is not likely to be acted upon by the U. S. A., since the U. S. A. would feel that it would likely deliver all of Vietnam to the Communist forces. At the opposite extreme one could recommend that the U. S. A. should land enough troops in Vietnam to suppress completely the Viet Cong; such an action carries with it the possibility that China and Russia would retaliate by sending in their troops; such actions could easily produce World War III, complete with intercontinental ballistic missiles and nuclear weapons.

The policy of the mediator should lie between these two extremes and should satisfy certain requirements with respect to acceptability and feasibility. Various political solutions may be proposed; of these proposals some would have more likelihood of success in that they would be firmly anchored to known facts concerning the nature of man and society; such facts may be found in the social sciences.

Rather than look for such makeshift solutions as another partition, as in 1954, we should look for a policy which would control the conflict in Vietnam, a policy which would allow the people of Vietnam to shape their own future.

* Co-Editors of Peace Research Abstracts Journal

A political solution is difficult to negotiate in a state of tension. Neither party is willing to yield for the sake of peace, because they still have hopes of victory without all-out global war, and each is afraid that even a move toward conciliation might be interpreted as a sign of weakness. These observations are confirmed by a recent study by William Gamson and Andre Modigliani at the University of Michigan[5], who analysed Western and Soviet moves and countermoves as reported in New York Times over a period of 7 years, and found that a "hard" policy is successful in a time of confrontation, while a "soft" policy is preferable in a period of non-confrontation.

Superordinate Goals

The sociologist, Muzafer Sherif[6], has conducted experiments dealing with methods of resolving conflict. Each of two hostile groups of boys would consistently misperceive the characteristics of the other group and could not even accept that any individual in the other group had even one virtue or strength; the facts were either denounced as untrue or were twisted so that virtue was turned into evil and strength into weakness. Sherif arranged summit meetings of the leaders of these groups, and in those cases when the leaders reported back to their own groups favourably with respect to the other side, the leaders were denounced as turncoats or dupes. Contacts between group members, dissemination of accurate information etc., were also ineffective because of the feelings of hostility and suspicion which had been built up, and because of the stereotyped images of the enemy which each group had built up. Only one technique of reconciliation was found by Sherif to be successful. This consisted in finding a project which required the active co-operation of both groups and which was clearly in the best interests of both groups to do. When the individuals were working side by side on a project which was bigger than their rivalry (i.e. a superordinate goal), they got to know each other and their misconceptions faded away. Virtues were then clearly seen as virtues and negative stereotypes were replaced by realistic evaluations of each other as individuals. When the project was finished the conflict was also finished.

Mekong Development

A suitable superordinate goal project in Vietnam would be the development of the Mekong River Valley[7]. This project has begun already under United Nations auspices. It is for this project that President Johnson has generously proposed an American grant of 1 billion dollars. This aid has been rejected by both North Vietnam and China. Both of these nations would be more likely to be in favour of the proposal if the aid was given through the United Nations Economic and Social Council which is conducting the present programme in the Mekong. We believe this because we are aware that new nations are reluctant to accept aid from either side of the Cold War and secondly because the same reaction has been observed in participants in the Inter-Nation Simulation developed by Harold Guetzkow et al[8], of Northwestern University for the American Air Force, when these participants had the role of decision makers for poor countries.* Because the source of aid

* The method of Inter-Nation Simulation is described by Richard A. Brody, Journal of Conflict Resolutions, Vol. 7, No. 4, Dec. 1963, pp. 663-753.

money is so important to the developing nations, we would strongly recommend that a government seeking to resolve the crisis in Vietnam give a cheque, now, to the United Nations for the Mekong Development with the stipulation that the cheque is conditional upon other governments following suit. Such an action may induce the American government to do the same. If this happened, then the opposition of North Vietnam and China might disappear. The participation of China is not indispensable to the success of the scheme to develop the Lower Mekong, since China owns only the upper reaches of the river. Chinese participation would be desirable, both from the standpoint of river development and conflict management; but if China should refuse to cooperate in a U. N. -sponsored scheme because she is not a U. N. member, the scheme could proceed without her. *

The United Nations Force

The difficulty in the immediate application of this proposal is that it is difficult to initiate this vast development scheme while fighting continues. It seems like a vicious circle: the common goal would decrease hostility when in operation, but its initiation requires at least the cessation of military operations. It appears that a two-prong attack on the problem is required.

To enforce an armistice, something more than the International Control Commission would be required. The proposals that a United Nations Force be sent to Vietnam are probably the easiest way to achieve this, and in addition carry with them several characteristics which we would welcome; namely, the connotation that United Nations Forces can be sent anywhere in the world (with the consent of the government of the affected region) to stop war or revolution whether or not the nations involved are members of the U. N. Such multilateral action should be encouraged. While it is difficult for the U. N. to act in its present financial and constitutional crisis, it should be remembered that the Security Council is not affected by that crisis, and that the U. S. S. R. is not opposed to U. N. peace-keeping when authorized by the Security Council. It would seem realistically possible that the permanent members would refrain from a veto and that the proposal to set up a U. N. peace-keeping force for Vietnam would obtain the required majority, in spite of the fact that neither South nor North Vietnam nor China are U. N. members. Actually, according to Larson and Larson[2], the U. N. Charter requires calling a Security Council session when a threat to peace fails to be settled by a regional organization. The wording is that a session "shall" be called.

At the same time as the Security Council is setting up a U. N. force, the Economic and Social Council - the other prong of the two-prong attack - should be organizing the drastic enlargement of the Mekong River Development project. A conference of the belligerents should be held to arrange the armistice. The sending in of a United Nations Peace-Keeping Force will stop the shooting, but the basic political problems will then remain. What should the ultimate goal be?

* Admission of China to the U. N., desirable for many reasons, but presenting problems of acceptability to the U. S., is deliberately not dealt with in this paper, which is limited to the subject of Vietnam.

U. N. Supervised Election and Unification

At some time in the future, elections in the whole of Vietnam should be held, with the United Nations ensuring that the elections are free and that all political parties are given an equal chance to appeal to the electorate. Several objections may be presented to the idea of an election and we shall deal with these one at a time.

McGeorge Bundy has said that no communist country would ever allow a free election. However, if the U. N. Forces supervise the election, the tension is relieved by co-operation on a common goal, and the atmosphere in both parts of the country is changed by the U. N. Administration, then a genuine free election should be possible.

Another objection is that an election would have little or no meaning to an illiterate population. Such criticism ignores the fact that India has held several successful elections in the last few years despite the illiteracy in the country. Aside from this answer, such critics should be invited to declare the manner in which they would wish to see a government placed in power; despite the difficulties which an election would produce, we can see no more fair or just way by which a government might be formed.

The election should be held after a suitable time during which the armistice has been in force, between 3 and 5 years. The time is rather long, to allow the development project to achieve results, and to permit feelings of hostility to subside. Vietnam would then be unified under a common popularly elected government. There would be no prior arrangement by any outside country as to whether the unified government should be aligned with the East or the West, or be neutral. The future of the country would be decided by the people of Vietnam, not by outsiders.

The Geneva Agreement stipulated that an election was to be held in 1956. This was not done; it should be carried out now, after proper preparation. This is better than engaging in recriminations about past failures, which cannot now be undone.

United Nations Administrative Force

In the interval between the arrival of the U. N. Force and the election, both halves of the country should be administered by the U. N. We suggest a new organization called the "U. N. A. F." (United Nations Administrative Force) to fulfill this function. Over the last decade much of the American aid to South Vietnam has been misappropriated; we would not wish to see this continue.

The U. N. A. F. would temporarily replace (or supplement at all levels) all existing governments in Vietnam, and act as a caretaker government to prepare for elections. It would not commit the nation to any particular economic or social system; this is for the Vietnam people to decide for themselves after the election.

Summary

We recommend the following, in chronological order:

(1) The United Nations Security Council should send in a United Nations Peace-Keeping Force to stop hostilities in Vietnam and supervise the cease-fire.

(2) Between the cessation of hostilities and the final settlement, a super-ordinate goal project should be established, such as the Mekong River Project, so that the conflict and tension may be reduced.

(3) Due to the reluctance of poor nations to accept aid from the two protagonists of the war, the aid should be given through the U. N. Economic and Social Council and governments seeking to end the conflict should lead the way in this regard by making their donations now.

(4) Elections should be held about 4 years after the cessation of hostilities under United Nations auspices in all of Vietnam, with the participation and freedom of all political parties guaranteed by a United Nations Electoral Commission and these rights protected by the Peace-Keeping Force.

References

1. Special Study Group on Vietnam, Victoria Branch, World Federalists of Canada; "The Facts About the War in Vietnam," 25 cents each from Dr. E. H. Richardson, 4497 Arsens Place, Victoria, B. C. (Cf. also Memorandum commenting on this, published by the Dept. of External Affairs, Canada; and reply to this Memorandum by Victoria Branch Study Group, W. F. C.)

2. Don R. Larson and Arthur Larson. "Vietnam and Beyond". Rule of Law Research Centre, Duke University, 1965. 42 pp. 50 ¢

3. Department of State Publication Number 7839. "Aggression from the North; The Record of North Vietnam's Campaign to Conquer South Vietnam". Released February 1965 - House Document No. 136, 64 pp.

4. J. Blair Seaborn. Statement of Canadian Delegation to International Commission for Supervision and Control in Vietnam, 7 pp. Saigon, Feb. 13, 1965.

5. William Gamson & Andre Modigliani "The Carrot and/or the Stick", Working Document No. 10, Carnegie Project No. 4, Centre for Research on Conflict Resolution, Univ. of Michigan Ann Arbor, Mich., November 1964, 49 pp.

6. Muzafer Sherif, "Creative Alternatives to a Deadly Showdown", Trans-Action, Washington Univ., St. Louis, January 1964, pp. 3-7.

7. Gilbert K. White, "Viet Nam: The Fourth Course", Bulletin of Atomic Scientists, December 1964, pp. 6-10.

8. Harold Guetzkow; Chadwick F. Alger; Richard A. Brody; Robert C. Noel, and Richard C. Snyder. "Simulation in International Relations": "Developments for Research and Teaching". Prentice-Hall Inc., 1963, 241 pp.

RECENT BOOKS

1. J. D. Bernal - Science in History. Watts, 1965, pp. 1038, £4. 4. 0.

2. L. P. Bloomfield et al - International Military Forces. Little, Brown & Co., 1964, pp. 296, $5. 00.

3. D. W. Bowett - United Nations Forces. Stevens & Sons, 1964, pp. 579, £5. 10. 0.

4. D. Brook - Preface to Peace. Public Affairs Press, 1964, $3. 75.

5. W. S. Emelyanov - The Atom and Peace (in Russian). Atomizdat, 1964, pp. 276, 97 kop.

6. R. Fisher (Ed.) - International Conflict and Behavioural Science. Basic Books, 1964, pp. 290, $6. 50.

7. A. W. Frutkin - International Cooperation in Space. Prentice-Hall,. 1965, $4. 95.

8. Margaret Gowing - Britain and Atomic Energy 1939-1945. Macmillan, 1964, pp. 464, £2. 15. 0.

9. L. Hadik (Ed.) - Trilingual Glossary of Strategic Terminology. Geneva Institute for International Studies, 1964, pp. 141.

10. J. J. Holst - Soviet Strategy and Disarmament Policy - A Bibliography. Norwegian Defence Research Establishment, 1964.

11. F. C. Iklé - How Nations Negotiate. Harper & Row, 1964, pp. 274, $5. 95.

12. H. Kahn - On Escalation. Praeger, 1965, pp. 308, $6. 95.

13. D. M. Kaplan & A. Schwerner - The Domesday Dictionary. Jonathan Cape, 1964, pp. 320, £1. 10. 0.

14. O. Kofoed-Hansen - The Negotiators: The Challenge of the Atomic Age. Meinksgaard, 1964, pp. 156.

15. A. Rapoport - Strategy and Conscience. Harper & Row, 1964, pp. 323, $6. 95

16. J. C. de V. Roberts - Disarmament in Fifteen Years. Federal Union, 1964, pp. 12, 6d.

17. V. P. Rock - A Strategy of Interdependence. Scribner, 1964, pp. 399, $7. 50

18. R. N. Rosencrance - The Dispersion of Nuclear Weapons. Columbia Univ. Press, 1964, pp. 343, $7. 50

19. Ruth B. Russell - United Nations Experience with Military Forces: Political and Legal Aspects. Brookings Institution, 1964, $1. 00

20. Alice Smith - A Peril and a Hope. Univ. of Chicago Press, 1965, pp. 656, $10. 00

21. T. Stonier - Nuclear Disaster. World Publishing Co., 1964, pp. 226, $1. 95.

22. J. B. Wiesner - Where Science and Politics Meet. McGraw Hill, 1965, pp. 302, $6. 95

23. G. Wolstenholme & Maeve O'Connor - Man and Africa. Churchill, 1965, pp. 400, £1. 5. 0.

24. Sir M. Wright - Disarm and Verify. Chatto & Windus, 1964, pp. 255, £1. 5. 0.

THE CONTINUING COMMITTEE
OF THE PUGWASH CONFERENCES ON SCIENCE
AND WORLD AFFAIRS

Chairman:	Lord Russell
Secretary-General:	Prof. J. Rotblat
Members:	
United Kingdom	Prof. R. E. Peierls Prof. C. F. Powell (Vice-Chairman)
U. S. A.	Prof. Bernard Feld Prof. Bentley Glass Prof. Eugene Rabinowitch
U. S. S. R.	Acad. L. A. Artsimovitch Acad. V. M. Khvostov Acad. M. D. Millionshchikov
Western Europe	Prof. E. Amaldi (Italy) Dr. H. Marcovich (France)
Eastern Europe	Prof. L. Infeld (Poland) Acad. I. Malek (Czechoslovakia)
Asia	Prof. V. Sarabhai (India)
Observer:	Prof. B. V. A. Röling
Assistant Secretary-General:	Dr. Patricia J. Lindop

Central Office
8, Asmara Road
London, N. W. 2, England.

Telegraphic Address
Pugwash, London

Printed by Taylor & Francis Ltd., Red Lion Court, Fleet Street, London, E.C.4.