USSR MINISTRY OF HIGHER EDUCATION
MOSCOW UNIVERSITY NAMED AFTER LOMONOSOV
BIOLOGY FACULTY
LABORATORY OF ECOLOGY AND NATURE PROTECTION
SOVIET COMMITTEE FOR UNESCO PROGRAMME
«MAN AND BIOSPHERE»
WORKING GROUP ON EDUCATION AND TRAINING

Informative material for the UNESCO/UNEP
Congress «Environmental education and training»

MAIN LINES OF ACTIVITIES OF THE WORKING GROUP ON ENVIRONMENTAL EDUCATION AND TRAINING OF SPECIALISTS

MOSCOW
1987



UNESCO UNEP

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Moscow University named after Lomonosov

6381

Moscow
1987

In the context of an ever greater anthropogenic pressure on nature it's a top priority to teach man to sensibly control his use of natural resources and to limit adverse environmental changes entailing his production activities. For this we need general environmental education.

Moscow University has since 1978 coordinated efforts towards environmental education and training of environmentalists in this country. The group in charge is made up of scientists (biologists, soil experts, geographers, physicists), scholars (philosophers, psychologists, journalists, economists) as well as officers of republican and national ministries of higher education and mass media men.

I. Educational, Methodological, Scientific and Practical Activities of the Working Group on Environmental Education

We still face the greatest difficulties in studying the problem of environmental education efficiency. Following UNESCO recommendations, the Working Group has singled out some priority lines of its activities:

- identification of the existing educational forms efficiency; search for approaches to practical implementation of environmental objectives;
- elaboration of educational concepts for students and specialists with different environmental background;
- development of lecture courses and training appliances relying on modern active teaching methods, role and simulation games, high quality environmental problems, practical and laboratory works;
- development of methodical issues of organizing environmental field studies and practical training sessions;
- promulgation of information on important environmental problems, teaching students to make decisions with an insight in all their consequences.

Present-day system of training personnel relies on the idea of environment's integrity. Environmental education must be a continuous, interdisciplinary, integrated process differentiated in terms of professional orientation.

6381

Environmental education covers state and public, or formal and informal, educational systems. The former is responsible for training will-be-graduates in higher educational establishments, specialized secondary schools, vocational and comprehensive secondary schools in keeping with the compulsory syllabus whereas the latter uses the facilities of various public organizations. Both of them aim at teaching students to properly pattern their behaviour in making decisions rather than simply inform them about existing environmental problems.

Environmental education has become a new direction of pedagogical theory designed to provide a new and a broader approach to practical education and character training. The idea of fostering in children care of nature is deeply rooted in man's distant past. Knowledge accumulated in the course of millennia took the form of popular traditions and came down from father to son as socio-historical experience. These traditions haven't lost their importance for the moral education of the younger generation.

A deeper study into historical aspects of environmental education and character training of children reveals consumerism, narrow interpretation of ecological problems, superficial knowledge of used natural ecosystems. With this in mind it is necessary to develop new syllabi for environmental education in secondary and vocational schools which must envisage a study on a number of environmental issues and secure fostering in children a truly civic responsibility for the state of the environment. Ecologization of education means that it should be oriented towards formation of system thinking relying on harmonized polysubject basic education and character training. The Working Group has formulated the general objective of schoolchildren's character training and environmental education: to help them correctly evaluate interconnection between social and individual values.

However, true ecologization of education is feasible only in case of orchestrated theory and practice of environmental protection. In this context public forms of environmental education, i.e. informal education, have an important part to play in meeting this challenge. The Working Group has attached priority attention to this form of education to

foster in children sensible and careful attitude to nature.

The Working Group co-sponsored with the editorial board of the newspaper "Komsomolskaya Pravda" a meeting "Nature and Children" (Pooshchino, 1980) on environmental education of children. The meeting revealed great potentialities and rich experience of out of school work with children accumulated by modern pedagogics. The meeting showed that the public form of schoolchildren's environmental education drastically complemented school curriculum education. Unfortunately it has no common programmes and develops to a great extent spontaneously. Using the facilities of a USSR Academy of Sciences biosphere station in Pooshchino a pilot children ecological station was set up there. A long-term psycho-pedagogical experiment aimed at developing in children ecologically adequate apprehension of nature was carried out in Moscow using the facilities of a school tourist club "Izyskatel" (Researcher). A national scientific and practical conference on environmental education and character training in secondary schools (Tallinn, 1980) discussed the types of schoolchildren's socially useful activities aimed at environmental protection in urban conditions. Especially popular among schoolchildren and students are such forms of environmental education as various forestries, circles, workshops, stations of young naturalists and clubs. The review of their activities carried out by the Working Group has confirmed that these mass organizations are promising and efficient for the development of environmental awareness. Their members resolve environmental problems while working directly in an outdoor setting. The review also demonstrated that in the long run it contributed to improved general level of the environmental public educational system. Twelve lines of practical environmental work with children who are on a holiday in summer pioneer camps were developed for students and teachers of Moscow University Faculty of Biology working there as Young Pioneer leaders. They were elaborated in keeping with the UNESCO MAB programme's section on "Environmental Protection in the System of Out of School Education."

In line with the principle of continuous environmental education and character training the Working Group attached

6361

priority importance to training competent specialists of various disciplines in institutions of higher learning and first of all at Moscow University Faculty of Biology which has pioneered in all new developments in higher education.

Lecture courses, general and specialized training of will-be-graduates must be oriented towards imparting them environmental knowledge necessary for a specialist of any discipline. A biologist, university graduate, must have expertise and practical skills of identifying environmental crisis situations and determining measures toward immediate assistance to nature. Ecologist's university background should equip a graduate with methods of biological monitoring and teach him to develop preventive measures designed to step down or to rule out adverse effect of toxic materials on the environment. Training of biologists, soil specialists and geographers must provide for their active contribution to resolving problems of impaired natural territories rehabilitation, harmonized development of urban settlements and nature, erosion control, etc. Engineers' sillabi pay priority attention to the development of low-waste and non-waste technologies, including decontamination, purification and trapping of gaseous, liquid and solid effluents and production by-products as well as efficient management of mineral deposits. Environmental issues should be given priority in training architects and builders too.

In keeping with the advanced objective the Working Group has been carrying out large-scale educational, methodological and research work. Relying on available resources, it has initiated development of new lecture courses and qualitatively new problems on environmental protection. The Working Group has paid special attention to developing active instruction methods.

To advance the use of active instruction methods in environmental education, there have been developed and approbated simulation games and discussion materials which allow participants to size up the limits of the problem, to make out the level of their knowledge and to identify the variety of view-points and approaches to resolving the problem under discussion. It has been graphically proved that game teaching methods greatly promote the learning process and have a dra-

matic pedagogical effect. A game, as an extremely dynamic process, develops skills of decision-making and analysing various situations approximated to reality with due account of "feedback". The games clearly reveal priority of social factors at all activity levels. Simulation games have been widely practiced in training students at Moscow University Faculty of Biology parallel to a study course "The Biosphere and Mankind". Simulation games "Coordination Commission" and "An Island" have been developed and encompassed into the academic process. The former has been successfully used since 1980 at the Faculty of Biology in the Kirghiz University as well as in the Universities of Gorky, Kazan and Lvov. The latter is meant for students who do not specialize in biology and school-leavers. "An Island" is a table hand-model of a terrestrial ecosystem which renders it possible to reproduce the process of its formation in time. The model dynamically demonstrated fluctuations in population numbers at various trophic levels of the ecosystem, unity of food relations, interspecific competition and some other factors. In keeping with the request of the UN Interregional Project in Demography for Developing Countries a variant of the simulation game "Development without Destruction" has been developed in English and a lecture course on environmental protection has been read to UN grant-aided students since 1981.

Principles and approaches to the development of methodological issues in applying active teaching methods for environmental education are described in collected articles "Active Teaching Methods in Environmental Education" put out by Moscow University Press in 1982.

The Working Group actively contributed to environmental continuous education programmes for professionals carried out at the Faculty of Biology. It accumulated rich experience in arranging such events as lectures on environmental protection in secondary schools, in the network of adult education centres, at Moscow University Faculty of Social Professions. It co-sponsored workshops and seminars for management officers and Party activists, including trainees at the Academy of National Economy under the USSR Council of Ministers. The Work-

6381

ing Group members participated in the work of teacher continuous education course at the Tartu University and continuous education project on man's interaction with nature at the Moscow Institute of Physical Engineering. Jointly with the staff of the library named after Alexei Gorky they compiled lists of reference literature for lecturers, etc.

1982 saw a very important and timely experiment. On the Working Group's initiative professors of biological specializations from various universities came to Moscow University Faculty of Biology for a pilot continuous education course in "Environmental Protection". The review of accumulated experience and trainees' papers made up a collection "Environmental Education in Universities" put out by Moscow University Press in 1985. Professors of zoology and botanics from 17 universities located in different parts of the country took part in this continuous education project. Its objective was to acquaint the trainees with up-to-date factual material and environmental protection concepts; to teach them to use a complex of active environmental education methods; to help them master methods of environmental research and to give them a chance to conduct independent research and methodological work on attending lecture courses and seminars on teaching methods. Trainees' work was concentrated on problems developed by the Soviet MAB Committee. Their methodological studies and research dealt with the analysis of the World Conservation Strategy and the use of simulation games in the course "Environmental Protection" as well as methods of teaching environmental courses and other aspects of environmentsl education. The review of this work and earlier experience gained in similar events allowed the Working Group to identify a number of organizational and pedagogical principles of training environmentalists of great learning.

At present the Working Group has taken the lead in sponsoring, using Moscow University facilities, an environmental continuous education project for the leading managing and economic officers and foreign specialists. This initiative has been backed up and approved by the USSR Ministry of Higher Education which has made a respective decision.

Analysing most efficient forms of training environmentalists one should not underestimate the importance of public environmental education forms (informal education). By this we mean, for instance, an environmental movement of students and schoolchildren working in keeping with specific programmes (for example, such as the "Fauna" programme aimed at study and conservation of rare animal species) and united in Nature Conservation Squads. They shared down experience of their research and practical work within the programme frame at workshops and seminars sponsored by the Moscow University Youth Council jointly with the Working Group (Pooshchino, 1980, 1982). The Nature Conservation Squad at Moscow University Faculty of Biology, set up in 1960 with an active participation of Professor V.N. Tikhomirov and Associate-Professor K.N. Blagosklonov (will-be-members of the Working Group), has been one of the most active squads in this country. It has been awarded a diploma of the YCL Central Committee for its performance. The squad uniting students of other Moscow University faculties has also made a tangible contribution to the programme implementation. The results of squads' work towards organization of tourism, conservation of national parks, identification of habitats and the number of rare species, poacking control, etc. are described in their scientific reports, handed over to the clients (ministries, departments, reserves), and in articles. Squads' members have worked in keeping with the programmes charted out with the help of the Moscow University Youth Council (for instance, programmes "Shot", "Fauna", "Recreation", "Pine-Tree", etc.). The Youth Council has carried out large-scale methodical and popularization work. It has sponsored a practical training session for will-be-biologists with participation of experts from CMEA member-countries. The Youth Council has maintained close contacts with the International Federation for Study and Conservation of Nature. Experience of Moscow University in the field of environmental education won the recognition of the Intergovernmental Conference on Environmental Education in Tbilisi in 1977 and the XVI-th General Assembly of the International Union for Conservation of Nature and Natural Resources where an exhibition

6381

"Moscow University Students Conserve Nature" was displayed. It was also highly appreciated at the XIV-th and XVI-th General Assemblies of the International Federation for Study and Conservation of Nature held in 1979 and 1982.

One should mention the following mass organizations actively contributing to environmental education in this country: the Council for Conservation of Nature under the YCL Central Committee, the All-Russian Society for Conservation of Nature, the All-Union Society "Znanye" (Knowledge), the Council on Tourism under the AUCCTU, the Moscow Society of Naturalists, the All-Union Geographical Society, etc. 1978 marked a set-up of a specialized section of the Interdepartmental Scientific-Technical Council on Comprehensive Environmental Problems and Rational Management of Natural Resources under the USSR State Committee for Science and Technology. Its objective is to promote exchange of experience in environmental education with international organizations. This section made a tangible contribution to sponsoring and holding of national conferences on environmental education in 1979, 1984, etc.

The composition of practically all environmental organizations and study courses at Moscow University is presently characterized by a tendency towards comprehensiveness, system approach to problems and interdisciplinary research. Moscow University has accumulated unique experience in this field.

II. The Working Group's Activities Towards Popularization of Environmental Education Ideas in the Soviet Union and Abroad. International Contacts.

In its everyday activities the Working Group has continually looked for new organizational forms of work, securing maximum comprehensiveness of research and rapid application of its findings in the practice of environmental education.

It has worked in close contact with such organizations as the USSR State Committee for Science and Technology and a section on education under it, the USSR Academy of Pedagogical Sciences; the section on methods of the USSR Ministry of Public Education; the All-Union Society for Conservation of

Nature; CMEA - secretariat (the department of science); the USSR Commission for UNESCO and other Working Groups of the MAB programme. The Working Group has paid top priority attention to the development of interdisciplinary interaction programmes, intra alia, programmes of psychological and sociological research in the domain of environmental protection. In 1978 a Centre of Biological Research of the USSR Academy of Sciences in Pooshchino hosted a symposium "Psychological Aspects of Nature Conservation" co-sponsored by the Working Group and the Moscow University Youth Council. Participants in the Symposium noted the objective imperative of making conservation of nature, rational management and reproduction of its riches a form of social practice in which the broadest population strata should be involved. In this context psychological studies in nature were regarded as a component of interdisciplinary research on the system of environmental protection. The Symposium's conclusions were used for organizing further integrated environmental work in Pooshchino.

A comprehensive programme "Ecopolis" has been carried out jointly with the Centre of Biological Research at a pilot testing ground in Pooshchino and it environs since 1981. It has united experts in various disciplines. Its ultimate objective is to develop recommendations which should identify a constructive approach to resolving problems of conservation and optimization of the environment in urbanized territories and providing an ecologically, psychologically and socially optimum environment for urban areas. The programme has made a tangible contribution to environmental education of population and has actually paved the way for this important direction in the public life of such a specific town as Pooshchino. It boils down to organizing environmental monitoring in Pooshchino and its suburbs. In keeping with the contract on scientific cooperation between Moscow University and the Centre of Biological Research scientists carried out initial inventory of Pooshchino's flora and fauna, identified the degree of pollution of the town territory and its environs with heavy metals and pesticides and the degree of impact of the population's mass recreation on the ecosystems of the town and its suburbs, etc. They also studied the state of preserves,

5381

allotted territories for the organization of new protected sites as well as identified social attitude of the town inhabitants to nature and assessed the state of educational work with children. This work, carried out jointly with experts and interested organizations in Pooshchino, rendered it possible to identify certain tendencies and elaborate recommendations which improved the efficiency of environmental work in Pooshchino and other small non-industrial towns.

The results of the first stage of the "Ecopolis" programme implementation were summed up at the Conference "Ecology of Small Towns" which stressed great social significance of this work and its orientation towards practice. A working variant of the "Ecopolis" programme designed to optimize urban habitat was developed. Participants in the programme, including researchers of the Centre for Biological Research, were taught applied fundamentals of environmental expertise and study methods. Ecological maps and maps of existing and potential ecological conflicts were drawn. Ecological approaches to determining the level of inhabitants' environmental awareness were charted out and recommendation on protection of preserves in Pooshchino were developed.

The Working Group sponsored meetings, conferences, workshops, exhibitions and ecofilm reviews as well as some other events. It paticipated in the organization and holding of 3 workshops on programme "Ecopolis"; the X-th Moscow-Estonian workshop for young scientists on protection of urban ecosystems in 1983; 2 national conferences within the frame of Scientific and Economic Society (using the facilities of the chair of economics of nature management, Department of Economics, Moscow University) in 1983; and a national scientific conference on environmental education in 1984. The Group participated in the I-st National Conference on Environmental Education in 1979 and the I-st International Congress on Biospheric Reserves in Minsk in 1983. The members of the Working Group intervened at Plenary Meetings of MAB SC in Riga in 1980, Dushanbe in 1981 and Tallinn in 1987; read papers at the International Symposium on Environmental Education of Schoolchildren sponsored in 1982 by CMEA member-countries and Finland; at the

meeting on environmental character training, education and continuous education hosted by the GDR in 1978. The members of the Working Group helped organise a periodical exhibition "Ecoposter" in Czechoslovakia in 1978. They took part in meeting with delegations of Polish, Bulgarian and Hungarian youth nature conservation organizations, delegations from Great Britain and the Korean People's Democratic Republic. Group's participation in the events devoted to environmental education is reflected in the Review Collection of 1981, collections "Problems of Environmental Education and Character Tra ning" and "Environmental Education and Character Training", issued respectively in 1982 and 1987 as well as in the materials of the MAB SC Plenary meetings.

Thus, the IX-th Plenary Meeting of the Soviet and republican MAB Committees sponsored in Tallinn in 1987 discussed the results of work in the domain of environmental education and character training for the decade since the Tbilisi Conference (1977) and noted that practical work in this field was carried out in line with the decisions adopted at conferences in Minsk (1979) and Ivanovo (1984). The Plenary Meeting stressed greater public interest in environmental studies in the context of the on-going reform of higher and specialized secondary education. The Plenary Meeting resolution stressed that the set-up and the activities of the MAB Working Group on Environmental Education and Training of Specialists at Moscow University Faculty of Biology had greatly promoted popularization of environmental, legal and economic knowledge in the field of environmental protection and had made a major contribution to the development of environmental education concepts, including retraining of specialists in various branches of national economy. This resulted in set-up of a Faculty of Continuous Education in Environmental Protection and Rational Management of Natural Resources at Moscow University as well as development of active teaching methods, including modern simulation (business) games in this domain. The development of an interdisciplinary programme "Ecopolis" does credit to the Working Group.

To popularize environmental knowledge, the Working Group

6381

members prepared jointly with the staff of the "Biology" Pavilion at the USSR Exhibition of Economic Achievements an exposition "Development of Research on the UNESCO Programme "Man and the Biosphere" in the Soviet Union" and a number of exhibits: "Ecopolis"; "Environmental Education and Training of Personnel"; "Universities -- Leading Educational, Methodological and Scientific Centres of the Country"; "Conservation of Animal Kingdom". These exhibits won gold, silver and bronze medals of the USSR Exhibition of Economic Achievements.

The Working Group members prepared together with the researchers of the laboratory of ecology and environmental protection (the chair of higher plants, Moscow University Faculty of Biology) exhibits "Man's Habitats and their Environment" for the Soviet pavilion at the EXPO-85 in Japan. Among them there were booklets on environmental education and character training, simulation games, popular science and slide films.

The members of the Working Group actively participated in the deliberations of an International Symposium on the subject "The Role of Cinema and Television in Developing Care of Environment" sponsored by UNESCO in 1980 and International Film Festivals "Ecofilm". Soviet programme at the Festival in Ostrava (Czechoslovakia) in 1986 was made up of 5 competitive films: "Biosphere--Life Habitat"; "Earth - our Common Home"; "Man and North"; "Let's Keep our Rivers Clean"; "Natural Environment: State and Control". The latter film won the prize of the Central Council of Czechoslovakian Trade Unions. The film "Students' Environmental Protection Squads" was shown hors concours.

Great attention is being paid to educational films on environmental issues shot on the order of the USSR Ministry of Higher Education. For instance, a colour educational film "Guests of Nature" was shot in 1982 and a popular science film "It is not Too Late Yet" -- in 1985. The Working Group members energetically promote use of educational films in the academic process at the Faculty of Biology. Organizational and methodical recommendations for the producers of environmental films rely on proposals advanced by the Working Group members at the seminar on educational films on environmental

issues and the workshop on efficiency of environmental popularization (1981, 1983).

In keeping with the objectives of the MAB programme in general and those of MAB Soviet Committee in particular the Working Group has paid special attention to representing Soviet achievements in environmental education on the international scene and analysing other countries' experience in this domain. CMEA countries specialists approved basic methodological principles and results of environmental education organization at Moscow University. CMEA Secretariat compiled and published "Recommendations on Environmental Education Problems in Secondary and Higher School" and collected articles "Environmental Education in Secondary Schools of CMEA Member-Countries". One should specially stress that MAB programme on environmental education has been developed and carried out with an active contribution of Soviet experts.

The Head of the Working Group G.P. Gapochka participated as the deputy head of the Soviet delegation in the meetings of the Working Groups devoted to the inclusion of Project N 14 in the MAB programme and in the meeting on education and training of specialists in the context of MAB programme in Washington. After the International Seminar on Environmental Management in Geneva, where the Soviet Union was represented by G.P. Gapochka and V.I. Ivanov, such elements of academic process organization as simulation games were introduced in the practice of teaching students in Moscow University and the Moscow Institute of Physical Engineering. This seminar was the starting point for the development and inclusion in the academic process of new specialized courses on environment protection and applied ecology as well as on the problem of interaction between nature and society.

G.P. Gapochka represented the USSR at the 5-th meeting of the CMEA Council of Representatives on "Conservation of Ecosystems and Landscape" in Yugoslavia where he studied the possibility of coordinating the work on CMEA programme "Conservation of Ecosystems" with that carried out in socialist countries within the frame of the MAB programme. It was at this time that due to energetic efforts of Soviet experts Soviet

6381

National Committee on MAB programme was set up to resolve from common national positions all questions connected with the participation of Soviet organizations in the MAB programme and to develop general tactics of socialist countries' actions in the context of its implementation.

G.P. Gapochka was a member of the Soviet delegation at the UNEP 1979 meeting in Geneva on evaluation of environment which specially noted the necessity and importance of Soviet research on biospheric pollution and the achievements of Soviet scientific school in this domain. The Soviet delegation raised at UNEP level the problem of compiling an International Registry of Dangerous Toxic Materials and recommended UNEP to carry out work on evaluation of the environment.

V.I. Ivanov, Deputy President of the Working Group, took part in the annual UNESCO seminar on environmental education in Hungary in 1983.

The complex of active teaching methods developed by the Working Group was approbated at the international level: at the XIV-th Annual Conference on Simulation Game Modelling in Bulgaria in 1982 and at the Institute of Ecology (Technical University of West Berlin) where the game "Development without Destruction" was played with the students of the Faculty of Ecology in 1986.

Experience accumulated by the laboratory of ecology and environmental protection at Moscow University Faculty of Biology and simulation games developed by it were offered by the USSR Ministry of Higher Education as a contribution to Soviet-American cooperation. A new step in the advance of environmental education which many countries need so badly may be taken in the field of joint development of simulation games.

Conclusions

The first Intergovernmental Conference on Environmental Education (Tbilisi, 1977) put forward important guiding principles of environmental education. Of top priority is the thesis on the need of "integrated approach to the total environment, natural and man-made, with due account of technolo-

gical and social aspects." The Tbilisi Conference drew specialists' attention to the fact that the basic goal of environmental education is to develop in every person awareness of complicated interrelations between natural and man-made environment in all their aspects: biological, physical, social, economic and cultural. The decade that has passed since the Conference was abundant in events reflecting actual contribution of specialists of different disciplines to answering the question of general environmental education.

Many Soviet scientists and specialists are deeply concerned about maintaining ecological balance on our planet. We believe that their continuous joining up the Soviet National Committeefor UNESCO MAB programme in keeping with the top priority objectives of our times is of great importance for development of research on environmental education and character training and for overcoming narrowness of interdisciplinary interactions.

The specifics of environmental education as a new trend require further elaboration of efficiency criteria for education and character training of youth and specialists. For this we need ever greater coordination of various research directions in the field of environmental education. The time of sweeping changes asks for a new critical analysis of all environmental education links in the context of specifics entailing multilevel education pattern in this country -- general secondary education, specialized secondary education and higher education.

The Decree of the CPSU Central Committee and the USSR Council of Ministers on "Basic Lines of Reform of Higher and Specialized Secondary Education in the Soviet Union" published March 21,1987 stressed the need for better environmental education of will-be-specialists and their orientation towards rational and comprehensive nature management. Decisions recorded in this and other governmental documents urge the Working Group on Environmental Education of Specialists (UNESCO MAB programme) to look for new and even more efficient forms of work.

6381

A list of appendixes

1. Statute of the Working Group on Education and Training of the Soviet Committee for UNESCO Programme "Man and Biosphere (MAB)

2. A list of the members of the Working Group on Education and Training of specialists of the Soviet Committee for UNESCO MAB Programme

3. A Newsletter about the symposium "Nature Protection -- Psychological Aspects"

4. A Newsletter about Round Table "Man and Biosphere"

5. A Newsletter about the meeting "Nature and Children"

6. The excerpts from the Memorandum of the experimental qualification practice of teachers of universities on the course of "Nature Protection"

7. A list of the main publications of the members of the Working Group.

Appendix 1

"APPROVED"

Chairman of the Soviet Committee for UNESCO programme "Man and Biosphere"

Academician
V.E.Sokolov
"14" March 1983

"AGREED"

Deputy Minister of Higher and Secondary Education of the USSR

N.S.Egorov

"11" March 1983

S T A T U T E

of the Working Group on Education and Training of the Soviet Committee for UNESCO Programme "MAN AND BIOSPHERE" (MAB)

1. The Working Group is the working body of the Soviet Committee for MAB and is to render assistance in the implementation on the national scale of the International programme on education and training of the personnel in the field of interaction between society and nature.

The working group includes the head and his assistants, scientific secretary, experts and leading specialists directly engaged in the research work on the programme.

The working group reports to the Secretariat of the Soviet Committee for MAB and coordinates its activity with the Ministry of Higher and Secondary Education of the USSR.

2. The work of the Working Group (staff, premises, publication of the materials of the Group, travel expenses of the members of the Group, etc.) is financed by the head organization (Moscow State University).

3. The objectives of the Working Group:

- to encourage research work in the field of education and propaganda in nature protection;

- to participate in developing concepts of formal and nonformal education at different levels;

638I

- to analyze curricula and syllabuses and to prepare recommendations on the implementation of the principle of continuous ecological education;

- to take part in the analysis of text-books, teaching aids, visual aids and popular scientific literature;

- to prepare proposals for developing new effective methods of education and propaganda in the field of nature protection.

Research work is performed by the members of the Working Group at the chief scientific department (the chief scientific department is the Laboratory of Ecology and Nature Protection of the Chair of High Plants of the Biological Faculty of Moscow State University).

4. The members of the Working Group are obliged:

- to personally participate in the implementation of the plans of the Working Group;

- to actively promote the development of research and popularization of knowledge in the field of interaction between Man and biosphere;

- to periodically report to the Working Group about the results of their activities.

5. The members of the Working Group have the right:

- to conduct business correspondence using a special form;

- to request under the agreement with the Ministry of Higher and Secondary Education of the USSR information from higher educational institutions and other organizations on the problems of education and training of specialists in the field of interaction of Man and biosphere;

- to submit proposals and make recommendations to the Soviet Committee for MAB on the questions of international cooperation within the framework of CMEA, UNESCO and other international organizations in the field of education and training of specialists;

- to convene meetings for the sake of coordination research work in the field of interaction between Man and biosphere;

- to study the work of the refresher courses and facul-

ties organized under MAB programme;

- to make proposals to the Soviet Committee for MAB concerning the invitation of foreign scientists and specialists for delivering lectures, exchanging information and participating in the meetings arranged by the Working Group.

6. The Working Group is to closely cooperate in its work with other departments of the Soviet Committee for MAB, the division for Scientific and Technical Cooperation of the USSR State Committee for Science and Technology in the field of environmental education, the USSR Ministry of Higher and Secondary Education, the USSR Ministry of Education, the USSR Academy of Pedagogical Sciences.

6381

Appendix 2

List

of members of the Working Group on education and training of the Soviet Committee for UNESCO Programme "Man and Biosphere"

1. German P. Gapochka (Chairman of the Working Group) - Assistant Professor, Biological Faculty, Moscow State University, Moscow, 119899

2. Victor I. Ivanov (Vice Chairman of the Working Group) - Professor, Moscow Institute of Physical Engineering, Chairman, Section of Radiation Safety, Scientific Council on Labour Protection Problems of the USSR State Committee for Science and Technology and the All-Union Central Council of Trade-Unions; Moscow Institute of Physical Engineering, 1, Kashirskoye Highway, Moscow, 115409

3. Dmitry N. Kavtaradze (Vice Chairman of the Working Group) - Head of the Laboratory of Ecology and Nature Protection of the Biological Faculty of Moscow University, Candidate of Sciences (Biol.), Biological Faculty, Moscow University, Moscow, 119899

4. Lija F. Nicolaeva (Academic Secretary of the Working Group) - Senior research associate of the Laboratory of Ecology and Environmental Protection of the Biological Faculty of Moscow University, Candidate of Sciences (Biol.), Biological

Faculty, Moscow University, Moscow, 119899

5. Vadim N. Tikhomirov - Head of the Chair of Higher Plants, Biological Faculty, Moscow University, Professor, Moscow, 119899

6. Lev O. Karpachevsky - Senior research associate, Chair of Physics and Soil Melioration, Soil Study Faculty, Moscow University; D. Sc. (Biol.); Soil Study Faculty, Moscow University, Moscow, 119899

7. Nikolai N. Marfenin - Senior research associate, Chair of Zoology of Invertebrates, Biological Faculty of Moscow University, D. Sc. (Biol.), Biological Faculty, Moscow University, Moscow, 119899

8. Adolf U. Kharash - Chair of Social Psychology, Psychological Faculty, Moscow University, D.Sc. (Psychol.), Moscow, K. Marks Prosp., 6, 103009

9. Aron A. Brudny - Head of the Chair of Dialectical Materialism, Institute of Philosophy and Law of the Kirghiz SSR Academy of Sciences, Professor, D.Sc. (Philos.), 265-a, Lenin Av., Frunze-71, 720071, Kirghiz SSR Academy of Sciences

638I

10. Konstantin G. Goffmann - Head of the Laboratory of Nature Management; Institute of Mathematical Economics of the USSR Academy of Sciences; Professor; Dr.Sc.(Econom.); Moscow, 32,Krasikov str., II74I8.

II. Valerian N. Garanin - Chair of Nature Protection and Ecology of the Kasan University, Professor, Kasan, I8, Lenin str., 420008

I2. Victor V. Mazing - Professor of the Chair of Plant Systematics and Geobotany of Tartu University, D.Sc.

I3. Oleg N. Yanitsky - Head of Project I3 of MAB, D.Sc. (Philos); Institute of International Working Movement of the USSR Academy of Sciences; 9a, Kolpachny per, Moscow, I0I83I

I4. Boris S. Bratush - Associate-professor of the Chair of General Psychology, Psychological Faculty, Moscow University, Cand.Sc. (Psychol); Marks prosp, 6, Moscow, I03009

I5. Kirill D. Zykov - Secretary of Project 8-a of MAB, Senior research associate; Institute of Evolutionary Morphology and Animal Ecology of the USSR Academy of Sciences; Cand.Sc. (Biol); Moscow, 33, Lenin Av., II7071

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17. Nina B. Florova — research associate, Laboratory of Ecology and Environmental Protection of the Biological Faculty of Moscow University, Cand. Sc.(Biol.); Biological Faculty, Moscow, II9899

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Soviet Committee for UNESCO Programme "Man and Biosphere"

Working Group on Education and Training

NEWSLETTER 1/79

In 1978 a symposium "Nature protection - psychological aspects" was held in the Scientific Centre for Biological Research of the USSR Academy of Sciences in Pushchino. It was organized by the Working Group on Education and Training of the Soviet Committee for UNESCO Programme "Man and Biosphere" and the Youth Council of Moscow State University for Nature Protection. The main objective of the symposium was to discuss psychological problems connected with nature conservation and environmental education as well as to draft a preliminary programme of psychological research aimed at important methods of propaganda and education in this field in the light of the decisions of the Intergovernmental Conference on Environmental Education (Tbilisi, 1977).

The participants of the symposium came to the unanimous conclusion that there is an objective need for making nature protection, preservation and reproduction of its resources a form of social practice which would involve the public at large.

All this brings out a whole complex of concrete problems in the field of environmental education and proper forms of propaganda.

Of considerable importance in the solution of these problems is personal approach: use of the creative potentials of the activity, study of the aims (attitude of an individual to environmental problems and concrete ways of their solution), man involvement into nature protection actively, further enhancement of the prestige of nature protection among people of all walks of life.

It is particularly necessary to study the effectiveness of the influence of mass media and propaganda. Forms and methods of environmental education and primarily those connected

with non-formal activities of the youth (school forestries, nature protection guards, children ecological stations, etc.) should be investigated.

The problem of the control of the extent of the negative impact of technogenic factors on the organism of Man was discussed at the symposium. These phenomena can be quantitatively described with the help of statistical data on specific diseases or mortality rate among people subject to the action of the factors as compared with the rest of the population, which is reflected in the concept "risk". Consideration of the "extent of the risk" on the one hand makes it possible to prove that all the fears concerning the new modern machines and technology are not justified and, on the other hand, to establish scientifically justified norms and requirements for safety of technical devices and technology. Not of least importance might be the study of the behaviour of people in the situations entailing risks when planning and carrying out nature protection activities.

The participants stressed that the psychological aspects of nature protection were insufficiently worked out. Psychologists have not yet drawn up their recommendations aimed at improving the nature protection activities. Yet, as the seminar participants unanimously pointed out, these psychological recommendations are badly needed. They should help to overcome the existing difficulties. Thus, lack of attention to the psychological aspect of the problem, lack of understanding of its actual importance sometimes leads to mistakes in propaganda and in development of proper attitude towards nature, to mistakes in the implementation of concrete nature protection measures and in particular in training specialized personnel. The participants expressed the opinion that it is necessary to undertake an extensive psychological research into the peculiarities of nature protection activity - a matter of state importance.

Attaching great importance to psychological research in the field of nature protection the participants of the symposium considered it as a component of inderdisciplinary research into the nature protection system, outside of which

this research loses its importance to a considerable degree. It was stressed during the discussion that in order to make the interaction between scientists and management successful in carrying out complex interdisciplinary activities it is necessary to provide them with information on psychological aspects of this interaction.

The organization of complex research activities (experiments, testing of scientific recommendations) at the test grounds meets these conditions and the objectives. One of the potential test grounds may become the Scientific Centre in the town of Pushchino - Scientific Centre for Biological Research of the USSR Academy of Sciences.

During the discussion proposals and recommendations were made on a number of problems: "Nature and personality", "Objectives and methods of environmental education", "Nature protection and mass communication", "Nature protection activity and its specific psychological features". Mention was also made of the advisable trends in the development of psychological problems concerning nature protection.

Appendix 4

Working Group on Education and Training
of the Soviet Committee for UNESCO MAB Programme

Moscow State University
Youth Council for Nature Protection

NEWSLETTER No. 2/79

In 1979 a Round Table meeting organized by the Working Group on education and training of the Soviet Committee for UNESCO MAB Programme and Moscow State University Youth Council for Nature Protection was held. The meeting was devoted to the results of the first four years of the publication of "Man and Nature" ("Znanije" Publishing House, editor-in-chief N.N. Filippovsky). It was attended by the workers of Biological Faculty, Geographical Faculty, Faculty for Soil

Studies, Chemical Faculty, Philosophical Faculty and Journalism Faculty of Moscow State University, representatives of the Central Economic and Mathematical Institute, Moscow Physics Engineering Institute, Moscow Chemical and Technological Institute named after Mendeleyev, Institute of Finance and Economic, the Central Studio of Popular-Science and Educational Films, workers of the journals "Nature", "Rural Youth" and the workers of the newspaper "Komsomolskaya Pravda", students of the Geographical Faculty of Moscow State University. N.N. Filippovsky, the chief editor of the series was invited to the meeting.

All the speakers without any exception expressed their approval of the publication of the series "Man and Nature" and pointed out that these series were valuable and necessary for the education of wide audiences in the field of ecology and nature protection. They conveyed a number of wishes to the editorial board which related to the topics of the series, the content of the articles and the design of some issues.

The speakers pointed to the insufficiently high scientific level of certain articles which sometimes contain rude, from the scientific point of view, mistakes, It was noted that the articles coming to the editorial office should be reviewed by scientists-specialists.

Remarks were also made on the style of articles of certain authors. The language should be lively, "more understandable to the man" but it should not be notable for "rollicking and undue familiarity". At the same time it is important to avoid another extreme - a superfluously scientific character of articles. To overcome all these shortcomings it is necessary to invite not only scientists but journalists and people who "wield a skilful pen" to write articles, essays, etc. fur the series.

It was also pointed out that there are practically no articles intended to develop in readers an active attitude to the problems of nature protection; to explain to them the concrete problems in the solution of which they might personally participate.

Opinions were also expressed on how to diversify the to-

pics of the series. And it was suggested in particular to include articles dealing with engineering problems; to describe positive and negative experience in "humanizing" nature; to insert in the series information of the work of students' nature protection guards.

The mention was made of the necessity to increase the amount of materials giving this or that evaluation of the presented facts. Moreover it is useful to give an account of positive and negative views in respect of the processes or phenomena which evoke controversial opinions.

A number of suggestions were made with respect to the designing of the issues. The speakers pointed out that the form of micromonograph chosen for the series "Man and Nature" can be considered acceptable (i.e. the issue is entirely devoted to a certain problem and contains the main essay with complementary material - illustrations, commentaries, short articles on the same topic, verses). At the same time it was stated that since this very form was chosen for the series, the material should be presented purposefully and not to "burden" the reader's mind with pictures and text having no relation to the topic of the issue and sometimes to the problem of nature protection as a whole. They pointed out that it is necessary to improve the quality of printing of the issues - sometimes the pictures are so carelessly made that it is difficult to recognize the plant or the animal shown in that picture. As to good photoes they are very often blurred.

The Working Group jointly with the Youth Council plans to continue in future the discussion of special publications on nature protection.

Appendix 5

NEWSLETTER 1980/1

Memorandum on the Results
of the Meeting "Nature and Children"

In 1979, the Scientific Centre for Biological Research of the USSR Academy of Sciences in the town of Pushchino hosted

the meeting "Nature and Children" arranged by the Working Group on Training and Education of the Soviet Committee for UNESCO programme "Man and Biosphere" in cooperation with the editorial office of the newspaper "Komsomolskaya Pravda". The participants of the meeting were members of the Working Group, employees of the editorial office of "Komsomolskaya Pravda", heads of children communities and organizations, teachers of secondary schools, research workers.

The main objective of the meeting was to summarize the most progressive experience achieved in the pedagogical work with children and teen-agers in order to develop scientifically substantiated methods of environmental and non-formal education of schoolchildren.

Over 20 reports and presentations reviewing the long standing experience of vocational, ecological, aesthetic, moral and physical education and training of children were discussed.

For a more thorough examination of the means and ways and the results of environmental education the participants of the meeting had discussions with children from several organizations: "ETO" Club ("Aesthetics, Creativity, Communication") of the town of Rostov-on-the Don, "Lesovichok" ("Wooddwarfs") club of interschool forestry in the town of Pushchino, the circles of young naturalists-biologists of school No. 2 in the town of Pushchino, the Club "Kim" of the town of Gorlovka, the Club "Northern Star" of the secondary school named after Odoevsky in the Tula region.

Four films were shown to the participants of the meeting, namely: "Medication", "Schooner of 'Coevals'" and two films about the Zagorsk home for blind, deaf and dumb children. The participants of the meeting could also see the exhibition of children's drawings and handicrafts.

Non-formal (out-of-school) environmental education essentially compliments school compulsory education, however, unlike the latter it has no uniform programmes and is practically developing spontaneously. The meeting acknowledged that by the present time the USSR accumulated quite a rich and original experience in non-formal activities of children in va-

rious fields including environmental protection. These original preferable forms of activity worth of approval and further development undoubtedly incorporate school forestries of the Minor Forestry Academy of the Forest Institute of the Karelian branch of the USSR Academy of Sciences, experimental expeditions on discovering, registration and protection of cultural monuments in the Northern part of Russia (the town of Petrozavodsk, State University), club "Aesthetics, creativity and communication" (Pioneer Palace in Rostov-on-the Don), Club "Northern Star" of the secondary school named after Odoevsky of the Tula region, experimental television outposts (the town of Syktyvkar, Komi Autonomous Soviet Socialist Republic, Club of Friends of Games of Lesnogorodskaya rural school of the Moscow region, Club "Dozor" (Patrol) (at the Institute of General and Pedagogical Sciences, Club "Schooner of 'Coevals'" (the town of Novorossiyisk of Krasnodar area, the headquarters of pedagogical groups (the town of Perm, Pedagogical Institute), experimental methods for developing creating abilities of school-children (School No. 2, town of Reutovo of the Moscow region), Club "Kim" (Pioneer Palace of the town of Gorlovka), Club "Ant-hill" of children's library No. 97 of Pervomaisky district of Moscow, biological cabinet at the pioneer camp of the Moscow region, a nature protection circle of the Moscow Municipal Palace of pioneers and schoolchildren, Club "Lesovichok" of the inter-school forestry in the town of Pushchino of the Moscow region.

The participants of the meeting characterized especially high the world unique experience of the Zagorsk home for blind, deaf and dumb children (the town of Zagorsk of the Moscow region, A.V. Apraushev). Nature plays an extremely important role especially in the life of blind, deaf and dumb children and this fact should be taken into account when working with these children.

The participants of the meeting admitted the significance of environmental education both in the system of nature conservation in our country and in the whole system of communist education of a harmonious and creative personality.

Nature protection by children, as was noted by the par-

ticipants of the meeting is at the same time a powerful stimulus for developing person's individuality.

The work of the meeting showed that efforts made by the Working Group and the editorial office of "Komsomolskaya Pravda" in collecting and studying original teaching experience and its adaptation and use for the objectives of environmental education were very fruitful. The participants of the meeting emphasized the necessity to continue this work.

The participants of the meeting highly appreciated exceptional activities of the newspaper "Komsomolskaya Pravda" in the search for and in the description of the original pedagogical experience of the teachers who creatively continue and develop the best traditions of Soviet pedagogical science.

As the result of the work of the meeting a number of organizational and pedagogical principles ensuring successful involvement of children and teen-agers into the nature protection activities were revealed, namely:

1. The principle of labour activity;
2. The principle of productiveness;
3. The principle of free choice;
4. The principle of collectivism;
5. The principle of active participation in social life and self-management;
6. The principle of perceptional and research activity;
7. The principle of aesthetic perception of the environment.

Implementation of all these principles requires certain specific features to be developed in the individual and the knowledge in the teachers: the teacher should look upon a child as his partner, his friend and companion; the teacher should be ready for a dialogue, for a fair discussion and solution of diverse tasks relating to nature protection. It is quite obvious that the teacher should be a highly educated person with a creative attitude towards nature.

The teacher himself should be a very good organizer capable of uniting children within children nature protection organizations and involving them into the social system on the whole.

It is advisable to adapt the forms of non-formal environmental education to the nature of the children institution where it is performed.

A number of various methods to be used in different conditions were pinpointed at the meeting:

- "teaching the other" - "eradication of environmental illiteracy" - school-children teach pre-school-age children,
- algorithmization - use of elementary algorithms,
- game-collection of scripts of folk games, dramatization, ecological games;
- ceremony;
- free access to the instrument of research;
- indirect education in nature protection.

The meeting found it necessary:

- to more widely propagate books by writers-naturalists,
- to involve on a broader scale urban senior school-children into the work at the field camps in forestries; to work out organization and legislation basis for arranging such camps,
- to involve students-biologists and geologists into the work in the pioneer camps,
- to combine the activities in nature conservation and those in protection of cultural monuments and relics,
- to use folk traditions and customs in nature protection activity,
- to create methods of nature protection work for pioneer camp leaders,
- to recommend the Scientific Centre for Biological Research of the USSR Academy of Sciences to set up an experimental children ecological station at the Biosphere station of the Institute of Agrochemistry and Soil Studies of the USSR Academy of Sciences.

Appendix 6

NEWSLETTER No 1/1982
The excerpts from Memorandum

In 1982 following the decision of the Refresher Courses of Moscow State University and the Dean's office of the Biological Faculty of Moscow State University the Working Group on Education and Training of the Soviet Committee for MAB organized the first experimental qualification practice of the university professors and teachers on the course "Nature protection" at the Laboratory of Ecology and Nature Protection of the Chair of High Plants of the Biological Faculty of Moscow State University. The course "Nature protection" was introduced as compulsory into the new curricula of the u i-versities of our country.

Over 30 lectures and seminars were given at the Refresher Courses by six members of the Working Group. 20 professors and teachers of zoology and botany of the Biological Faculties from 17 State Universities of the RSFSR and other Union Republics were at the Refresher Courses.

Below are given the objectives of this qualification practice:

- familiarization with the up-to-date factual material and concepts in the field of nature protection;
- study into a complex of active methods of environmental education (discussions, role playing and simulation games);
- study into some methods of research in the field of nature protection;
- preparation of individual teaching aids and research works.

The following lecture courses were delivered.

Basic lecture courses: "Biosphere and mankind", "Plant world protection", "Animal world protection", with further colloquims on the topics.

Review lecture courses (2-4 hours): "Medical aspects of nature protection", "Economy of nature utilization", "Psychological aspects of nature protection", "Ecological aspects of

urban way of life", "History of nature protection", "Soil protection", "Pesticides and their interaction with environment", "USSR national parks and prospects of their development", "The role of museums in nature protection propaganda", "State standards and nature protection", "Toxic pollution and biocoenoses", "Progress of flora study and nature protection", "Organization of student's expeditions on nature protection", "The place of film in the educational process", "Problems of struggle against poaching - "Shot" programme", and the lectures on active methods of education: "What do active methods of environmental education mean?" and "Creation of simulation games and their place in education and research".

Classes on the methods of holding discussions, role playing and business (simulation) games were arranged, including a table game "Simulation model of the world" and a simulation (educational) game "Coordination commission".

The subjects of discussions were for example: "Is nature protection a science or practice?", "Ecological means of the solution of food problems", "Does hunting fall within the moral principles of nature protection?"

Shows of Soviet and foreign educational and scientific films on nature protection, their detailed discussion and meetings with film directors L.N. Chernyavsky and E. Dilmukhamedova were arranged.

A three-day trip was organized to the Scientific Centre for Biological Research of the USSR Academy of Sciences (Pushchino, Moscow Region), lectures on the ecology of a small town were delivered, excursions.

The participants of the experimental qualification practice were familiarized with the direction of the work of the Soviet Committee for UNESCO MAB programme.

As an exchange of experience the participants of the experimental qualification practice delivered lectures on the topics suggested by them and exhibited some publications (posters, universities' local papers, teaching aids and individual researches).

During the whole month they carried out individual research work in the field of nature protection on the topics

suggested by the organizers of the Refresher Courses and the results of their work were presented and discussed at the conference which was held on too. The topics of individual work were for example: "Approaches to the implementation of the world strategy of nature protection at global and regional levels"; "Analysis of the world strategy of nature protection in view of the objectives of training specialists"; "Applied aspects of nature protection in view of the adoption of the "Law on the protection of animal world in the USSR"; "Content-analysis of mass media by an example of journals "Chemistry and Life" and "Nature" as a scientific approach to the evaluation of the effectiveness of propaganda of nature protection" and others.

The organizers of the Refresher Courses provided those attending the courses with special publications, such as "Tendencies in Environmental Education", UNESCO, 1977, and others.

Samples of forms of programmed credit test on nature protection and written lectures were given as teaching aids.

The participants stressed the importance and timeliness of the organization of qualification practice for lectures on nature protection. A number of organizational and pedagogical principles were formulated. These principles ensure efficient training and turning out of highly-qualified specialists in the field of nature protection. They are as follows:

- the basic principle of training and retraining specialists should be a systematic approach, which is ensured by using Academician V.I. Vernadsky's concept of biosphere;
- another, not the least important principle in environmental education, is comprehensiveness which means that environmental education (formal and non-formal) should practically embrace all the population of the country;
- predominance of an interdisciplinary approach over monoresource approach which plays a leading role now;
- training by involving people in active work;
- teaching decision-making within the framework of a collective;

The participants pointed out to:

- the necessity to widely involve professors and teachers into research work relating to nature protection problems as well as to introduce these problems into educational and research work of students-biologists and students of other faculties;

- the necessity to summarize and widely exchange experience in environmental education both inside the country and at the international level (conferences, seminars, meetings).They stressed that practically no active methods of teaching were used (discussions, role-playing and simulation games, content-analysis, etc.).

The main objective of universities in the field of environmental education consists in the further improvement of theoretical fundamentals and methods of teaching. Many universities even now have actually become important educational, scientific and methodical centres in the field of environmental education and training (both formal and non-formal). The mention should be made of the urgent need for opening (setting up) specialized departments and courses in nature protection, introducing active methods of teaching. All the problems of formal and non-formal education and research work in the field of nature protection and rational utilization of natural resources should be concentrated at specialized chairs of ecology and nature protection.

Taking into account the experimental character of these Refresher Courses it is advisable to provide for the following in future:

- to annually arrange Refresher Courses at the University for lecturers on nature protection;

- to keep only the main series of summary lectures;

- to give special lecture courses depending on the invited audience;

- to consider exchange of experience among the participants of the Refresher Courses useful and to leave special time for this purpose;

- to consider it advisable to increase the number of summary lectures devoted to the specific problems of nature pro-

tection;

- to recommend to send specialists to the Refresher Courses once every five years;

- to make the Refresher Courses last one month, 120 hours (30 hours a week); most of the time should be devoted to mastering active methods of teaching;

- the number of participants should not exceed 20;

- it is advisable to include into the new group 3 or 4 persons from the previous course in order to accumulate and generalize the experience;

- the trainees should be grouped by age on the spot;

- it is advisable during the period in between the scheduled Refresher Courses to hold 2-3 day seminars to discuss some teaching methods and invite to these seminars leading specialists and interested persons; to hold once every 5 years a seminar of the heads of the chairs of general ecology and nature protection in order to get acquainted with the curricula of the Refresher Courses and to outline the general principles of its work and formation of groups (this can be done during the meetings of the heads of theirs of Biological Faculties).

Appendix 7

The list of main publications of members of the Working Group from 1978 to 1987

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Под редакцией Г.П. Гапочка

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ПО ОБРАЗОВАНИЮ И ПОДГОТОВКЕ СПЕЦИАЛИСТОВ
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