

P and P
Environmental
science

INTERVIEWS: AMB

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SW	<i>all</i>	<i>[Signature]</i>
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Meeting: with selected
group of scientists to
advise on the QE Program

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Drs. Auerbach, Gates, Kassander, Leonard, Oglesby, Sprugel and Talbot were invited by WMM to meet with principal officers to advise on the QE program. Full name, address and present affiliation of each person is appended. The background and recognized capability of invitee qualifies him for potential consideration as an officer in the QE program. RF officers present: JGH, WMM, KWT, JMW, JEB, SW, RWR, NL, KW for lunch, and MPT who joined the group after lunch.

Following is AMB's summary interpretation of general consensus of the group on the issues discussed:

(1) great need for education in environmental quality matters at all levels, including the adult general public; (2) need for interdisciplinary problem-solving research with especial involvement of relevant social sciences, and also a major emphasis on ecology; (3) need for action programs in appropriate areas, although difficulty of certain such programs is recognized, and certain types of action programs would not likely be appropriate for consideration; (4) support of ecological and other environmental modeling, and monitoring are not regarded appropriate for consideration, although the importance of these matters is recognized; (5) need to seek ways to stimulate much more federal support for environmental work; and (6) the direction taken thus far in the Foundation's QE program is objective and progressive.

WMM welcomed the group and expressed appreciation of the Rockefeller Foundation for their willingness to take time out of their busy schedules to advise with Foundation officers.

JGH gave a brief description of the Foundation's programs, indicating that the latest domestic program, Quality of the Environment, was approved by the Trustees in the annual meeting of December 1969.

WMM provided the group with two short papers briefly describing the developing Quality of the Environment program.

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He mentioned the grants that have been made in the various areas up to the present time, which is included in one of these papers. WMM then opened the meeting for discussion, indicating that since we have no agenda, he hopes for a free-wheeling discussion.

Gates: There are a good many well trained people and as yet not many openings for people trained in environmental quality matters. He expressed concern that if present tight economic conditions continue very long, there may be an oversupply of environmentally trained people.

JGH commented that while we are now in a hiatus, it is clear that ultimately there will be a great need for many properly trained people in environmental quality matters. For instance, the National Institute of Environmental Quality now being talked about would create a great demand if this organization develops. Likewise the proposed National Institute of Ecology would need many highly qualified scientists.

Auerbach: This is the first time in history that there has been a real demand for interdisciplinary people, that is, people trained in interdisciplinary fields for quality of the environment work.

Oglesby: We need to involve the social scientists in the ecology concept. This has been a big gap in the training and research programs up till now.

Talbot: There is need to have ecologists who involve man fully in the total system.

Gates: Ecology is only one actor in the theatre of environmental quality.

Sprugel: It is now just sinking into biologists that they must broaden their outlook to involve appropriate social scientists. Recently he attended a meeting for three days which dealt with biology manpower. Ultimately there will be a great demand for environmentalists with interdisciplinary training.

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Talbot: The international aspect of environmental programs is great. The Smithsonian Institution has a new contract with U.S. A.I.D. for environmentalists to create interest abroad. The World Bank is going to employ people with interdisciplinary training for environmental work abroad.

Kassander: There is now a large scientific manpower group with specialized training that ought to be put to work on environmental problems. There is an oversupply of young Ph.D. physicists, and many of them can readily adapt to environmental work.

Oglesby: We really need to develop highly competent scholars in this area.

Auerbach: We have a great many applicants for employment from men highly trained as physicists, and we can accommodate only a few in ecological work. They will learn very fast and make a real contribution.

Gates: Mentioned some of the sensitive environmental quality areas. Pesticides is an example. Air pollution is a pressure point in the system. Recycling is a pressure point in every respect. Nutrient enrichment of water resources is another. There is need to educate the public. Communications are very vital in order that the public will know about the real problems of environmental quality.

WMM: RF made a small contribution to BSCS recently to aid in the development of high school teaching materials on environmental quality matters, including socio-economic aspects.

KWT: Mentioned societal problems in regard to defacing the environment. It is clear that many cultural factors are involved and are neglected. At present we are just paying lip service to environmental quality. We have to start doing something really significant about it.

Talbot: In the Philippines there are lots of wastes everywhere, but in Malaysia it is pretty clean, so there must be a cultural feature.

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WMM: What can RF do to develop social consciousness?

Gates: Smokey the Bear is a great success.

Kassander: Signs "Don't be a Litterbug" ought to be effective, put in conspicuous places so people will know just what to do. There is indeed a cultural lag. Suppose somebody gave a prize for police enforcement of litter laws.

Gates: How can the packaging industries be educated to stop putting so many products in packages? Just look at the stuff you get when you buy a shirt. Recently 200 business people came together in Washington, D.C. in a program entitled "Quest for Quality." Such activities offer much promise. There is great need for more dialogue.

Auerbach: We now recycle about 25 percent of newsprint and much more could be used if we would only get with it and work out a program.

Leonard: We are quite disturbed by the attitude of many in the academic community toward environment, in that they believe present emphasis is just another fad and will soon lose popularity. There is need to create permanent awareness and concern about environmental quality problems.

Gates: Expressed gratification that RF is demonstrating such tangible interest in the environment. It is such a major problem, in fact, it is equal to a war. RF can be helpful in getting other foundations to support quality of environment efforts on a massive scale. If foundations could put more money into the program, it would have a stimulatory effect of federal agencies too. In regard to the federal programs, they won't commit funds to really do what ought to be done. Therefore, foundations should seek ways to get more federal money into the program.

Sprugel: How can we create more pride in the people? Take churches, for instance. Preachers can't talk about the major environmental quality matters objectively because their church

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support depends on local people. Many are employed in manufacturing companies. Probably you could get church associations to really be objective in considering quality of the environment matters.

Gates: Littering et al. can be dealt with in schools, but every citizen should have education on earth ecosystems with particular regard to what has gone on before and about the fragility of the ecosystem earth. Acturally this equals the "Three R's" in elementary schooling.

NL: How do you use teaching media to change attitudes?

Talbot: Have there been studies of what makes certain programs effective? RF might devote effort to surveying these situations.

Auerbach: The problem is really for the next century, so the root of it is education. In the past century, agriculture and medicine have done this very effectively, and RF probably should identify educational institutions that are capable of developing innovative environmental quality programs.

Kassander: We need to do something positive instead of having everybody talk like the prophets of gloom. We need demonstrations such as the Santee, California water program, which is a very positive and successful development.

RF might gamble on certain demonstrations, for example:

H_2SO_4 can rejuvenate ion exchange for converting brackish seawater, but the cost of the chemical is too great to be practical. However, there is a large surplus of this acid from SO_2 reclamation in stacks. Possibly a way could be found to get these two factors together.

We need to identify the real problems where the community is willing to put resources into a project but cannot carry it out without some additional funds. Possibly RF might assist in identifiable situations like this.

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Auerbach: The Muskie-Baker bill now in Congress proposes the establishment of six national environmental laboratories to be located in various sections of the country. These would be very large centers with all the relevant disciplines represented which could be foci to interact in a mutual way with academic institutions in the region.

SW: In international agricultural work, we must involve specialists and not generalists. At the International Rice Research Institute, there are about fifteen specialists in relevant disciplines working in teams on the problems. When you look at community action, it appears that you need to educate the people on the feasibility of such action. Who cares what you do with an old automobile, etc. Perhaps areas should be identified in which a relatively small amount of funds could aid a community to solve an important environmental problem.

WMM: Asked about ecological modeling, RF has received proposals for support of work in modeling such as a model for the entire Great Lakes system.

Gates: He would like to see modelling of what is really happening. We must look at this as a stepwise process.

Oglesby: We need to really know what the total problem is and to analyze each of its facets and their characteristics. Modeling techniques are exceedingly useful for such purposes.

Both Talbot and Auerbach spoke enthusiastically about the need for modeling in quantifying aspects of major environmental quality problems.

WMM: What can come out of systems analysis, modeling and simulation modeling?

Oglesby: We're talking in terms of a big system which must be analyzed with regard to the physical, biological and socio-economic aspects and this is where systems analysis and modeling are really helpful.

Talbot: There is need to develop methodology and modeling in practically all environmental quality problems.

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Gates: Ecology as a science has not yet really arrived and it should have reached that status. There is great need to increase knowledge in the area of ecology. Ecological modeling is desperately needed, but environmental modeling is a bigger and more complex matter.

Kassander: Ecological and environmental modeling does not appear to be the best bet for RF support. Because of his experience working on a PSAC panel dealing with environmental quality problems, it appears to him that modeling is being widely employed in most of the work of federal agencies as well as in many of the universities that are involved in environmental quality work.

The discussion shifted to other areas that RF might wish to consider.

Auerbach: There is a very large amount of legislation in Congress and already an existing large body of law on air, land, water, solid wastes, noise and other environmental factors. But laws are only as effective as they are enforceable. While this is an important area for support, it is probable that RF could not be involved in such effort because of the Internal Revenue Service regulations.

Kassander: Thinks RF might concentrate on certain urban and environmental problems in selected localities and solutions developed would be useful in solving similar problems elsewhere.

Talbot: RF might identify gaps in the federal programs and support the work that isn't being done but should be done.

WM: The magnitude of RF financial support for the various programs is not actually budgeted each year. There is a continuous evaluation of each program. RF has a total income of \$30 to 32 M and expends out of capital another \$12 to 15 M, totaling about \$45 to 47 M annual expenditures. Guide-line this year for the QE program is \$4.5 M and this might expand to \$5 or 6M. Hence the need to be very critical of the projects considered and ultimately funded.

Gates: In regard to community action possibilities, there are many foundations concerned with community programs but it is difficult to get them interested in local community problems. Possibly RF could stimulate other

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foundations as well as state and federal agencies by helping the small communities put pressure on federal sources to get more funds. If RF can find mechanisms to get pressure generated on state and federal agencies for more support, this would be very helpful. Is it feasible for RF to consider special recognition to someone in government who has done something outstanding to achieve improvement in environmental quality? If so, these and other mechanisms might be found to improve the government's attitude toward the problem and increase resources devoted to it.

WM: Appropriate and adequate environmental education from the kindergarten through college and graduate work is a vital need. Are there ways to stimulate such needs?

Sprugel: A workshop of all state superintendents of education might be one way to start giving them a background in environmental quality and stressing the need to have adequate materials in the entire educational system.

Kassander: What would you teach them? In view of the dearth of really adequate teaching materials in this area there is great need for innovation in the teaching process.

Auerbach: There are many local efforts at the lower level of education in getting material taught in the elementary schools that focuses on ecology and environmental quality matters.

WM: Finding ways to educate all the public to the gravity of environmental quality problems is an important objective - it would span the entire gamut from kindergarten to adults.

WM: Should RF concern itself with standards of quality of the environment such as air, in special regard to monitoring for air pollution? We have received proposals in this area. The question then, should RF consider supporting such work as monitoring?

Auerbach: Expressed entirely negative view toward devoting any funds to monitoring. The IBP program is proposing the establishment of a global network of monitoring systems on environmental quality. Federal and private sectors are doing a lot of monitoring.

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Kassander: In connection with his work on a PSAC panel, he has learned that at least ten groups are working in the area of monitoring.

Talbot: There is a great amount of activity in the area of monitoring. Surveys are underway. The federal government has money to put into this area when adequate techniques are developed, but the problem at present is, what do these data mean in relation to quality of the environment. There is need for some group to come up with a definition of standards of quality in actual measurable terms. This will be a major factor in the UN Conference on "Environment and Man" in Sweden, 1972. Perhaps RF could bring together a group of knowledgeable people to evaluate existing information and attempt to define standards of environmental quality.

Auerbach: There are good methods to accurately monitor carbon monoxide, but we don't have any real epidemiological background for evaluating the effects of this compound on people.

Oglesby: Monitoring techniques are needed for organisms in the air, but there is little progress in this area. Likewise viruses in water supplies need to be understood. Now we are getting some techniques for evaluation of viruses in water.

Gates: How can RF stimulate more federal effort in the quality of the environment? More education of the citizenry of the country?

Leonard: The process of education might start with this RF group, who would identify the problems.

Gates: The noise problem is increasing. Present laws should be enforced in order to alleviate this problem.

Oglesby: Consideration should be given to approaching teachers' colleges in regard to the education of teachers in quality of the environment. Since there are no ecologists on the staff and no research is in progress, these limiting factors are important. However, the teachers' colleges could make a big impact with appropriate teaching of environmental quality.

Talbot: Motivation is needed. We need to seek out positive ways to motivate people on quality of the environment. National Academy of Sciences

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had a big conference on this subject last year and their recommendations will be published. He will arrange for RF to get a copy of the proceedings.

WMM: In regard to youth interest and effort in environmental quality, how can we capitalize on this important resource?

Gates: Summer employment of high school kids would help a lot.

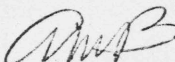
Kassander: In regard to the involvement of youth, there needs to be a study by some group to find out what can be done and how to do it. Maybe some unemployed young Ph.D's in physics could undertake such a project.

Gates: We have had proposals from young Ph.D's in physics to study the problem of oil that is coming into a bay in Maine. This is summer work. Unfortunately we could not support it. We must find a way to make use of the enthusiasm of young and qualified people. Leadership is needed in this. Professors are generally too busy to be concerned with matters of this kind.

Leonard: NSF funds are available for a new program entitled "Inter-disciplinary Research Relevant to Problems of our Society." The proposals coming in are largely related to quality of the environment. The initial funding was \$6M a year for this work, and it is hoped that it will be increased to \$13 M in the new fiscal year. The funds are planned to go toward the development of research expertise in all areas of environmental quality.

During lunch and thereafter until adjournment at about 3:00 p.m., there was general discussion of areas of environmental quality that were mentioned during the morning meeting.

WMM expressed sincere appreciation of RF to the group for their interest and help in the QE program.


A. M. B.

Return to Marion Lane

RWR

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