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ACTIVATING GEOTHERAPY AND GLOBAL BIOETHICS

1. Creating a global bioethics. Transforming the Earth into a stable and unpolluted ecosystem will depend on the will of its peoples. The will must be nurtured by accurate information about the state of the planet and possibilities for the betterment and survival of the Biosphere, which is presently disturbed by human numbers and lifestyles. Possibilities of improving the biosphere correspond to "geotherapy", care of the Earth. Improving the health of the biosphere (including humanity) requires a conscious programme of geotherapy. Like medical therapy, geotherapy should use the latest scientific information, experience and common sense to diagnose patient Earth's ills, prescribe a corrective regime and apply it in a disciplined manner, without exaggeration, to establish vigorous health.

Geotherapeutic measures must be motivated, that is they must be acceptable to and desired by all peoples. The principles of global bioethics should serve as a guide for geotherapy, our future cultural evolution and the biological evolution of other species, which we ineluctably control. Global bioethics is not an existing system for export from industrialized countries; it should be a common synthesis of all countries. It includes accepting responsibility for delivering an improved world to our descendants. Its immediate task is to identify a human consensus on desires and will for the future. The rational base for global bioethics should come from a scientific understanding of the Earth, its history, processes and inhabitants. To go with this understanding a global philosophy for bettering life is essential to the well-being and survival of our species and others.

2. Developing renewable biomass resources. Producing energy from biomass will involve collaborating with national groups to select suitable lands for plant growth, assessing the chemical and physical state of the soil and water supply, choosing

candidate species for growth and considering the processing of the harvest to render it ready for use. The plants, prunings, wood, etc, may be burned directly to supply energy or processed to produce alcohol or other substances. This effort should be combined with the fight against desertification and land degradation. It has the potential for bringing direct benefits to individual farmers, foresters and other biomass exploiters. A large scale research and development effort is needed to improve the productivity and quality of existing species as sources of renewable raw materials and biochemicals.

3. Reducing pollution and waste. The extent and nature of the problem must first be established by chemical analysis, observation and monitoring. Toxic, non-toxic and radioactive wastes should be contained and treated. Excess concentrations of nutrients have become major pollutants in rivers, lakes, oceans and aquifers and must be abated. Releases must be curbed but existing contaminations should be cleaned up. In some cases wastes can be used profitably (compost, animal fertilizer...). Materials should be recycled when possible. Curbing emissions will allow the environment to recover gradually. However this may take centuries to be effective for the changes in ozone and greenhouse gases. Switching to non-leaded fuel in recent years may be considered a geotherapeutic measure that has already shown a preliminary success by analyses on Greenland snow.

4. Enhancing natural ecosystems. The aim in all cases will be to increase the health and primary productivity of ecosystems in order to progressively close the imbalance between fixation and combustion (or respiration) of carbon. Ecosystems need to be assessed for possible extension to unoccupied or degraded lands.

Geotherapy on all major ecosystems is in order. Research is needed in each ecosystem type, especially those with high productivity and biodiversity such as forests and coral reefs. Surviving ecosystems and protected areas should be conserved as much as possible; efforts should be made to restore ecosystems

in degraded areas. Ecological monitoring stations to study longterm variation of biodiversity, structure, productivity, disease and damage should be set up in each habitat.

Critical cases for investigation are: tropical deforestation may change humidity, cloud cover and soil moisture; corals in many parts of the globe are bleaching and some are dying, apparently due to elevated sea water temperatures; half of the world's grasslands are burned off each year, supplying a huge input of carbon dioxide to the atmosphere; the tundra of several countries is suffering; acid rain is causing forest decline; soil degradation, desertification and mining of deep aquifers are spreading and threatening the hydrological cycle and groundwater recharging.

5. Improving soil fertility. Most agricultural ecosystems fail to reach their potential productivity due to nutrient limitations. The limitations vary greatly depending on ecosystem type, climate and geology. Unbalanced fertilization has caused grave pollution on several continents. To improve soil fertility the spectrum of limiting elements must be identified in each zone in order to devise balanced mineral supplementation strategies and increase productivity. Soils can tolerate a certain level of contamination but their filtering and buffering capacity is limited and must be considered in all forms of treatment. Increasing soil fertility is essential to assuring future genetic and biomass resources, as well as to inhibit erosion and to protect watersheds.

6. Completing greenhouse accounting. Accurate diagnosis and therapy requires precise knowledge of all sources and sinks of climatically active gases. This demands that terrestrial and oceanic sources and sinks be known at least as well as fossil fuel use. For successful international efforts to control climate change, each country and region will need to know its net emissions of climatically active gases. Ecological monitoring stations should measure greenhouse gas exchanges between the atmosphere, biosphere, soil and hydrosphere. About half of the

fossil fuel carbon dioxide emitted into the atmosphere is unaccounted for. An element is therefore lacking in analyses of the carbon cycle that must be identified and quantified. Is the missing carbon going into the sea, land, aquifers or the mantle? These possibilities can only be tested through detailed accounting of carbon sources and sinks.

7. Promoting family planning worldwide. Without limiting human numbers a satisfactory balance between health of the global ecosystem and equitable access to resources will be impossible. A start can be made by discussing with national groups, experts and doctors, asking which measures would probably be best in their country and how family planning should be implemented. The main thing required in hyper-demographic countries appears to be contraceptive information to reproductive women. At the same time the general issue of women's rights and equality should be addressed. Harmonious relations between the sexes, both in law and in everyday life, is an essential element in an agreeable and lasting human environment.

Human survival is linked to the health of the ecosystems that surround us. Their productivity must be increased because of our demographic growth, which cannot be braked short of a catastrophic population crash within the next few generations. We must envisage a period of transition to a generally more healthy situation in the biosphere. The greenhouse problem must be dealt with, but this needs to be done in the context of an overall betterment of the biosphere, otherwise a purely technological treatment could add to the problem by destabilizing natural processes or provoking social resistance. Our cultural evolution will be strongly linked to new patterns of development of both industrialized and unindustrialized regions. Humanity has created the need for assuming conscious control of the evolution of the biosphere, both short-term and long-term.

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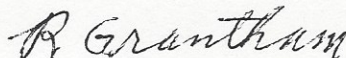
Dear Dr Qian,

This four page proposal for a programme in geotherapy has been written in consultation with seven other members of the INQUA Geotherapy group (H. Faure, T.J. Goreau, T. Greenland, N.A. Mörner, J. Pernetta, B. Salvat and V.R. Potter). It thus represents a rapid consensus by the group on the framework for a geotherapy programme. We hope you will find it interesting and look forward to hearing from you. We welcome any opportunity to contribute to the UNCED process.

Is this fax submission sufficient or should it be followed by a mailed copy (or copies)?

Incidentally, did you not receive my fax of 8 October?
I never got an answer.

Yours sincerely,



Richard Grantham
Professor Emeritus
President of Geotherapy group,
INQUA Global Change project