

TO THE ROOTS OF GEOETHICS **(HISTORICAL REMINISCENCE)**

Original ideas

Fifteen years separating us from the first specialised meeting to geoethics at Příbram (and in the world) - that is already a good reason for a brief excursion to the historical roots of the discipline and of the term GEOETHICS I had the pleasure to introduce to the Earth sciences community. What about the first steps?

In the period 1990/1991 my wife Lidmila Němcová in the course of her studying stage in France had the occasion to become acquainted with principles of business ethics (*éthique des affaires* - as represented by the outstanding French Professor *Jean Moussé*). After her return to Prague she started her efforts to introduce this new discipline into curriculum of her employer - the University of Economics in Prague. (It was the first attempt to arrange such a course in Czechoslovakia - in fact realised since 1992. Thus - step by step - Lidmila Němcová started to be involved also to various international and national networks as -e.g. European Business Ethics Network, Czech Society for Ethics in Economic, CEMS etc.)

Some of materials about business ethics have given me the idea to develop a specialised discipline for application of geological principles in geology and mining activities. This idea was based on my previous life experience with evaluating results of geological exploration (computations of ore reserves, space and time models of deposits etc.). The independent ethics applied for environmental problems undoubtedly was covering some identical problems but in my opinion without any guaranty for a correct long time use of any deposit. Various crucial dilemmas have to be solved in case of any deposit of mineral resources taking into consideration very specific problems where only educated Earth scientists can be effectively responsible for preparing and evaluating all needed data and realistic foundations.

In **September 1991 in Cracow** (at the symposium dedicated to the 70-th anniversary of Professor A. S. Trembecki) I proclaimed for the first time publicly some ideas concerning ethical principles of mining activities including the suggestion to initiate an internationally organised development of ethical mining. (*My paper "Technical and ethical problems with computerized modelling of exploitation in open pits" was published in the Symposium volume nr.4, pp. 99 - 104; ISBN 83-900110-1-8.*)

I repeated this idea in **August 1992 in Kyoto** at the International Geological Congress in the section II-24-1 "New ideas and techniques in geological education" - paper O-6 "*Ethical Geology in the Education Process*".

Geoethics at Příbram

Finally I had the opportunity to organise the first international meeting to this subject in **October 1992** as part of the **Mining Příbram Symposium** in this Czech town with a famous (recently stopped) tradition of mining activities going back to the 13-th century. Since early 1960s' regular annual symposia have been organised in Příbram dealing with various problems of not only mining activities but also with specialised sections on geology of mineral deposits and many other disciplines. Since 1968 until 1999 altogether 19 international meetings on mathematical methods in geology were organised - mostly under the umbrella of the International Association for Mathematical Geology; in 1968 I served only as an interpreter for two French specialists on geostatistics (Professor Georges Matheron and Jean Serra) but in 1969 I started a long activity as the chief convenor of this international section. Until 1999 numerous contributions were published and mostly presented by authors from all over the world. Therefore many top specialists from abroad knew Příbram symposia as participants of the meetings dedicated to the mathematical geology.

In October 1992 at Příbram it was just a half-a-day subsection "Ethics in geology, mining and energetics" that I convened as an international part of the section about environmental problems. Four guests from abroad took part: Jean Bussac (France), Liudmila Ryzhova (Russia), Professor Adam Stefan Trembecki (Poland) and Professor Franz Ludwig Wilke (Germany).

Regular independent international sections on geoethics have been organized since 1994 as a regular part of the Mining Příbram Symposia with Václav Němec and Lidmila Němcová as convenors. In that period also Professor W. S. Fyfe from Canada (in the years 1992 - 1996 President of the International Union of Geological Sciences) was personally engaged in helping us to promote the new discipline; he arrived to Příbram in 1996 and two years later - when other duties did not allow him to attend the Symposium, he arrived for 2 days consultations in Prague. At the 44th IUGS Executive Committee Meeting (1998, Vienna) Prof. Fyfe also announced plans for the October meeting on geoethics in Příbram (see <http://www.iugs.org/iugs/transact/ec44min2.htm>).

Table 1
Published documents on geoethics in the Mining Příbram Symposia Proceedings

<u>Year</u>	1992	1994	1996	1998	1999*	2001	2003	2005
		<u>2007</u>						
Number of countries	5	7	13	7	9	9	11	10
Cummulative number	5	9	15	16	16	18	18	20
Published papers/abstracts		9	33	38	24	27	30	25
26	27							
		<u>Cummulative number</u>						
212	239	9	42	80	104	131	161	186

* In 1999 the meeting took place in Prague

The growing and relatively large international audience in further meetings to geoethics at Příbram was just connected with the fact that the Symposium (thanks to its regular sessions on mathematical geology) was well known in many parts of the world. The authors of the new field of geoethics in majority were geologists and mining engineers (both from academia and industry) but other disciplines were represented as well (ecology, economics, mine surveying, history, philosophy, moral theology). Theoretical aspects as well as practical aspects were discussed.

Further development of the new discipline introducing the term "GEOETHICS"

Gradually the idea of an independent discipline has been generally accepted by the international community of Earth scientists and other specialists.

I started to use the new term *geoethics* at the beginning "unofficially" having in mind difficulties with an automated control of computerised texts suggesting to replace "geoethics" by "genetics", "geotechnics" and similar different terms. My first "official" use of the term "geoethics" goes back to the International Conference on Geoscience Education and Training in **Southampton, April 1993** - in my published abstract "Ethical aspects for teaching Earth sciences" the used word appears written as "geo ethical" - apparently because of the above mentioned problems.

Unfortunate experiences with natural hazards (especially those with relatively recent catastrophes like floods, tsunamis etc.) resulted in the necessity to incorporate these problems also into the content of geoethics.

Geoethics at the International Geological Congresses

Since 1996 geoethics started to be regularly presented also in the frame of the International Geological Congresses. The development of the discipline at this high forum is impressive. Whereas in 1992 (Kyoto) only two oral presentations concerning these problems in different sessions were presented by W. S. Fyfe and V. Němec, in 1996 (Beijing) a special subsection on geoethics was introduced (with V.Němec as convener), in 2000 (Rio de Janeiro) for the first time a special symposium was organized only for Geoethics (with V.Němec and P.P.Martins Jr. as convenors) and in 2004 (Florence) the development culminated with two sessions on geoethics:

- G-08.03 Geoethics I: Earth resources (260) - convenors William S. Fyfe and Lidmila Němcová;
- G-08.04 Geoethics II: Other Problems (218) - convenors V. Němec and M. A. Komarov (finally absent).

All sessions were organised in conjunction with problems of geoeducation.

Table 2
Geoethics as published and presented at the International Geological Congresses

Nr. IGC	Year	City	Published abstracts on geoethics	Oral presentations	Special Symposium on geoethics
29	1992	Kyoto	3	2	none
30	1996	Peking	5	3+1	21.3.1 ¹⁾
31	2000	Rio de Janeiro	10	4+2	26.1
32	2004	Florence	24	7	8.03 + 8.04

1) The results of the special subsection 21.3.1 on geoethics were presented in the General Proceedings (p.90): *It was agreed that the people, companies, states and international organizations had the social responsibility to protect the mineral resources and the environment and geoscientists had special tasks in this aspect. An interdisciplinary study of geoethics should be carried out in close combination with geological education.* - V. Němec at the same IGC in the workshop WA 06 "Mining and environment" gave a talk on ore mining and geoethics, *stressing the importance of resources and environmental protection in mine exploitation and discussing the environmental issue from the high plane of ethical virtues* (General Proceedings, p.91).

The institutionalisation of geoethics has been completed by forming a *working group for geoethics* under the umbrella of the *Association of Geoscientists for International Development (AGID)* with the first meeting at Příbram in 2004. Any meeting in the world - when discussing relevant topics - can be considered as an unofficial contribution to the activities of the working group.

The topic of geoethics has been incorporated to the official programme of the 33rd International Geological Congress in Oslo in August 2008 (with V. Němec and L. Němcová as convenors) - for the first time under the official umbrella of the AGID.

Geoethics = geosciences + ethics

Without any doubt all the above described development gives a testimony that according to the original idea geoethics has been focussed on combining geosciences (geology, mining engineering) with the applied ethics. This is also expressed by the chosen term "geoethics". In fact only a few contributions (e.g. in the Mining Příbram Symposium 2003 articles of two authors from Kazakhstan and Mexico) were outside the given frame of expected topics. These contributions were accepted to present another concept and to awake a discussion about the need to create some borders for the further development of geoethics.

Some more detailed information about geoethics corresponding to the original idea is given in the International Encyclopedic Dictionary published (p. 158) in the Russian language in *GLOBALISTIKA - edited by I. I. Mazur and A. N. Chumakov; ELIMA Publishers, PITER Publishers - Moscow - St. Petersburg - New York (ISBN-5-89674-020-4)*. The original Russian version is joint to this paper. The corresponding English version is attached as well; it was also presented in the paper GA 6 in the Mining Příbram Symposium 2003: *G. S. SENATSKAYA - V. NĚMEC: Geoethics as explained for an Encyclopaedia*. The same text should appear also in the published English version of the International Encyclopaedic Dictionary: GLOBAL STUDIES.

In the Dictionary among more than 2000 other terms also the following terms have been defined and explained:

- bioethics,
 - discourse ethics (K.O.Appel; J.Habermas),
 - ecological ethics,
 - ethics,
 - global bioethics,
 - global ethics,
 - global ethos,
 - Land ethics (Aldo Leopold),
- etc.

Conclusion

In the course of the last year I started to register various streams and movements using the same term "geoethics" for *different* concepts. *A short review of these different concepts of "geoethics" is given in the paper GD 5 in order to have some material for the needed discussion to find an appropriate ethical issue for clearly delimiting the areas of different interest and excluding any confusion.*

The scope of the present paper is just to use the 15 years jubilee of geoethical sessions as part of the Mining Příbram Symposium to present:

- a brief review of the development of geoethics ;
- the reason for the independent development of this new discipline;
- the necessity to introduce ethical principles into geological and mining activities (verified by the practical acceptance of geoethics in the international level.

The Russian version of the item Geoethics:

ГЕОЭТИКА (от греч. gé - земля и ethics - нравственность) - совокупность моральных норм, которым нужно следовать при освоении геосферы. Как самостоятельное научное направление геоэтика оформилась в 1992 г., когда в чешском городе Пржибрам состоялась международная встреча представителей пяти стран, принявших участие в симпозиуме "Горно-рудный Пржибрам в науке и технике". Автором термина и основателем научного направления "геоэтика" стал чешский ученый Вацлав Немец.

Геоэтика зародилась на стыке этики (учения о нравственности, о нормах морали) и геологии (учения о земле и ее недрах) и была принята научной общественностью (как естественниками, так и гуманитариями), поскольку пользование природными богатствами немыслимо без этического отношения к ним и ко всей геосфере в целом. Развивать геоэтику необходимо с учетом всех особенностей наук о Земле и общественной ответственности представителей этих наук.

На начальном этапе развития геоэтики как нового научного направления важно было сформулировать само понятие геоэтики. В ходе дискуссии было предложено несколько различных определений. Так, М.А.Комаров (с соавторами) под объектом геоэтики понимает "отношение человека и общества к геологической среде в разных аспектах его проявления". Г.С.Гольд рассматривает геоэтику как направление, изучающее "возможности использования этических принципов и норм применительно к деятельности" в области минеральных ресурсов. В плане глобальных проблем современности понятие геоэтики сформулировал Н. Шилин. Опираясь на труды В.И. Вернадского, выделившего новую земную (скорее планетарную) оболочку - ноосферу (сферу разума), автор указывает, что ноосферное мышление позволяет осознать геологическую и этическую роль человечества в преобразовании всех других оболочек Земли. В этом контексте геоэтика, по Шилину, объединяет комплекс этических проблем, связанных с геологической наукой и практикой в целом и с использованием минерально-сырьевых ресурсов в частности. Так или иначе, все исследователи согласны с тем, что геоэтика - это понятие, включающее нравственные начала по отношению к Земле как геологическому телу, равно как и к социальному, и экономическому объектам во всем их разнообразии.

Развитие геоэтики идет по пути дифференциации основных направлений:

теоретические аспекты (Г.Гольд, Н.Григорьев, М.Комаров, В.Немец, Л.Немцова, Г.Тимчак, А.Трембецкий и др.); прикладная геоэтика (В.Бабаев, Л.Немцова, Л.Рыжова и многие др. авторы); социально-экологическая геоэтика (Н.Григорьев, Г.Сенатская и др.), методологические, учебно-воспитательные, нравственно-религиозные, культурные, а также экономические и др. аспекты геоэтики (А.Гайдин, Г.Гольд, В.Гур, В.Немец, Л.Немцова, Г. Сенатская и др.). Среди глобальных проблем человечества есть проблема истощения природных ресурсов, в частности, минеральных ресурсов. При подходе к проблеме природопользования, особенно при добыче невозобновимого минерального сырья, весьма существенна роль геоэтики, например, при оценке месторождения полезного ископаемого геологи приводят показатель обеспеченности (в годах), т. е. указывают, на сколько лет хватит потребителям разведанных запасов при заданных объемах добычи. И здесь встает этический (геоэтический) вопрос: как, когда и сколько полезного ископаемого следует добыть, чтобы не только живущее, но и будущие поколения могли пользоваться богатствами недр, т. к. по большому счету они принадлежат всему человечеству. Только лишь экономический и экологический подход к решению этого вопроса "сужает свободу выбора для потомков, а это противоречит основам морали". Геоэтика может служить средством воздействия на сознание людей, побуждающим мотивом к созданию ресурсосберегающих и экологичных технологий обеспечивающих устойчивое развитие, комплексному и рациональному использованию ресурсов, поиску альтернативных (возобновимых) источников сырья и энергии, предотвращению экологических кризисных ситуаций. Методы, которыми пользуется геоэтика, те же, что и в др. областях знания: просвещении, образовании, воспитании, сущность которых заключается в формировании гармонично развитой личности, способной принимать ответственные решения на основе приоритета общечеловеческих, духовных и нравственных ценностей.

The English version of the item Geoethics:

GEOETHICS (from the Greek *gé* - *Earth* and *ethics* - *morality*) - a set of moral standards which are to be used when utilizing the geosphere. Geoethics was established as an independent scientific field in 1992 when in the Czech town *Příbram* an international meeting of representatives from five countries took place under the aegis of the symposium "The Mining Příbram in science and technique". The Czech scientist *Václav Němec* is author of the term "geoethics" as well as founder of this scientific field.

Geoethics - born at the junction of ethics (science about morality and moral standards) and geology (science about the Earth and its resources) - has been accepted by scientific society (both earth and social sciences) because any correct use of natural wealth is inconceivable without a proper ethical attitude to it and to the whole geosphere. Geoethics - accordingly to V. Němec - is to be developed with regard to all specificities of Earth sciences as well as to social responsibility of their representatives.

At the initial period of developing geoethics as a new scientific field the notion of geoethics had to be defined. E.g. M.A.Komarov (with his co-authors) considers geoethics as "the attitude of the man and the society to the geological environment in various aspects of its appearance". In the view of G.S.Gold geoethics is a field studying "possibilities of applying ethical principles and standards in activities" concerning the field of mineral resources. From the point of view of present global problems the conception of geoethics has been formulated by N. Shilin. Taking into consideration the works of V. I. Vernadsky - founder of the *noosphere* (i.e. the brain sphere) as a new Earth (or, rather, planetary) sphere - the author explains that the noospherical way of thinking makes it possible to realise geological and ethical role of the mankind in transforming all other Earth spheres. In such a context geoethics - accordingly to Shilin - unites the complex of ethical problems connected not only as a whole with both geological science and its practical applications but also in particular with the use of mineral resources. In any case all investigators agree that geoethics incorporate moral principles with special regard to the Earth as a geological body as well as a social and economic object in all varieties.

The development of geoethics follows differentiated principal ways: theoretical aspects (G.Gold, N.Grigoryev, M.Komarov, L.Němcová, V. Němec, G.Timčák, A.Trembecki and others), applied geoethics (V.Babaev, L.Němcová, L.Ryzhova, I.Stočes and many other authors), social and ecological geoethics (N.Grigoryev, G.Senatskaya and others), methodological, educational, moral and religious, cultural and also economic and other aspects of geoethics (A.Gaydin, G.Gold, V.Gur, L.Němcová, V.Němec, G.Senatskaya and others). The danger of exhausting the Earth resources (and especially mineral reserves) is among the most important global problems of the mankind. From the point of view of the problem of how to use natural wealth - and in particular how to exploit the non renewable mineral resources - the role of geoethics is of substantial importance. E.g. when evaluating mineral reserves in individual deposits the geologists use the so-called resources index (in years), i.e. they show for how many years the explored reserves will be available to the users in given exploitation volumes. And here an ethical (geoethical) problem arises: how, when and how many mineral raw materials are to be exploited in order to assure the use of Earth resources not only for those presently living but also for all future generations because finally these resources belong to the whole of mankind. When limiting the solution of this problem only by economic and ecological approaches then - accordingly to N. Grigoryev - the freedom of choice for future generations is also being limited, but that is contradictory to moral principles. Geoethics can serve as means of influence over consciousness of people: as a stimulating motivation to create technologies that take into consideration economy of resources; ecological aspects and sustainable development all over the planet; to a complex and reasonable use of resources; to search for alternative (renewable!) sources of raw materials and energy; and to prevent critical ecological situations. Methods applied by geoethics are the same as in other fields of knowledge: education, cultivation and culture that lead substantially to forming harmonically developed personalities able to find responsible solutions and to make responsible decisions based on priorities of spiritual and moral values common to all mankind.

About the author:

Dr. Václav Němec,

*Vice President, Association of Geoscientists for International Development,
convenor of the international section "Geoethics", the Mining Příbram Symposium,
convenor of the general symposium "Geoethics", the 33rd International Geological
Congress ;*

E-mail contact: "Vaclav Nemecek" <lidmila.nemcova@quick.cz>

