

WYBRANE PROBLEMY GEOETYKI W ZWIĄZKU Z DOKUMENTOWANIEM ZŁÓŻ KOPALIN

SELECTED GEOETHICAL EXPERIENCES WITH REGARD TO THE DOCUMENTATION OF MINERAL DEPOSITS

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Wskazane zostały wybrane kluczowe zagadnienia odpowiedzialności wykonawców prac rozpoznawczych zarówno za ich wyniki końcowe jak i częściowe oraz za ich wykorzystanie w dalszej działalności. Zaprezentowano niektóre ogólne problemy geoetyki, które powinny być brane pod uwagę przez decydentów odpowiedzialnych za podejmowanie prac rozpoznawczych.

Słowa kluczowe: geoetyka, dokumentowanie złóż kopalin

Several key moments in the whole process have been selected to show the expected responsibility of “players” who should guarantee the reliability of partial and final exploration results for the following exploitation process. Furthermore some general problems of geoethics are presented which have to be taken into consideration by decision makers responsible for exploration and exploitation processes.

Key words: geoethics, geological reports, mineral deposits

Introduction

In the early 1991 I have started to develop a new discipline – geoethics; at that time my work was motivated by my „life experiences” with evaluating and modelling deposits of various mineral resources (prevailing industrial minerals) and my first contribution to this new topic [1] was presented at the symposium organized by the AGH in Cracow in honour of the 70th anniversary of Professor Adam Stefan Trembecki. Professor Trembecki himself took my presentation as a challenge and started to develop geoethics in Poland for the next 16 years (a paper to this subject [9] was also among his last scientific contributions written a few weeks before his death). It is therefore a great pleasure for me to see that a considerable part of this seminar is focussed on geoethical problems.

As to the documentation of deposits of mineral raw materials ethics as well as geoethics are interested at first in the responsibility of all people taking any active part in the whole exploration and exploitation processes at various levels and in various phases. Because of the impossibility to briefly explain the given topic in a complex systemic way I would like to limit my remarks just to responsibility as it appears in a few key moments of these processes.

Basic information

Basic information about any deposit can be obtained in various points of recognition (drill holes, samples, laboratory chemical and technological analyses, geodetic identification,

petrography etc. etc.). Responsibility for a competent qualified work is shared by all those who take any part in the whole complex of exploratory works. Usually the appropriate duties are expressed in special professional codes of ethics. The competent managers should be responsible to authorize well trained and experienced people to such special works as designing networks of boreholes or other systems of exploration. Especially in tectonically complicated areas extraordinary care is needed when possible zones of the so-called inserted subsystems may appear where chemical and technological parameters differ from the usual values [2].

The scientific and technological development has brought considerable innovations for getting needed reliable data. Nonetheless special care is needed when some data of elder origin are to be used together with the newly acquainted data and when a satisfactory compatibility of all disposable information from different time periods has to be achieved.

Here we are coming to a key moment of the exploration process: all needed data have been verified and can be used for any further synthetic work.

Synthetic work with basic information

The synthetic work should be realized in accordance with the given goal (in a simplified way expressed by the demanded category of reserves). A paradox of needed competences and reliability appears: the lower is the goal (lower category, less data) – the higher should be the experience of the specialist authorized to this synthetic work (usually a geologist authorized

for designing the exploration system in the above described gathering of the basic information). A dangerous situation may appear (in reality even cases brought to a judicial process): the expenses should not be exaggerated when the area has been found as inappropriate for exploitation purposes.

In case of a rare network of exploration data and rather difficult geological structure of the deposit the input data give numerous alternative possibilities for the geological interpretation as well as for choosing appropriate methods for computing representative data expressing realistic quantitative and especially qualitative characteristics of such a deposit. It might even appear as useful to apply several parallel solutions leaving any needed verification to the further stages of the exploration process. In my own practical experiences with space models of deposits [3,4] I arrived to a possible process of detectonisation and reetectonisation what appeared as a very realistic and time-saving way for any future adaptation of the model when additional information made it possible. Naturally when sufficient additional information is available (finally from the exploitation process) any "improving" of the model becomes easier as a daily routine activity.

Protecting mineral resources for future generations

The non renewability and therefore also limited quantity of mineral resources demands a special care for the maximum use of disposable raw materials in any deposit under exploitation process. New priorities should be introduced into the existing systems of general human values. The exclusive control of the market leading even to plundering of deposits should be finally stopped. Various ideas have been already presented at the regular meetings of geoethicists at the Mining Příbram symposia in the Czech Republic or at the International Geological Congresses (both events since 1992).

Needless to say that actual situation demands to respect the protection of the environment (in developed countries usually in accordance with legal prescriptions). A really geoethical approach demands to seek an equilibrium of actual technical disposability and available economic means with some limits of toleration. Shifting exploitation to less developed countries without any legal protection of the local population against possible ecological dangers is far away from a geoethical solution. On the other hand let me remember just the last geoethical paper of Professor Trembecki to the so-called Legnica paradox [9].

Main principles of geoethics have been described by N. K. Nikitina [8]: the planet Earth = absolute value of the life; principles of respect, interdependence, harmony and balance of interests, responsibility to future generations, prognosticating, precaution, reversibility, integration, frugality etc. They should be incorporated in the optimal way into the consciousness and life of the contemporaneous global society.

Other basic geoethical problems

Contemporary trends are oriented to focus the attention of managers and decision-makers on necessity to include into their way of thinking and acting special regards to all possible, potential or really existing risks [5]. Some of them are connected with the geological factors (very often neglected when problems of environment sustainability need to be discussed). Geological research in the recent times has started to focus attention on this

problem. Further fundamental research should follow with the final goal to discover algorithms of the Nature. Let us remember the conclusion of the 33rd International Geological Congress in Oslo (2008): "*Planet Earth has a superb archive of past climates which documents great climate variability throughout Earth's history. Today's changes should be seen in the context of these billions of years of natural change*". Regularly repeated periods of global warming and cooling were demonstrated again in several symposia during the recent 34th International Geological Congress in Brisbane (August 2012).

Therefore the actual attention and orientation of responsible activities of Earth scientists need to be focussed on possible natural disasters (landslides, earthquakes) because of a needed forecasting as well as of suggesting appropriate measures for minimizing any potential expected damage. The future of our planet is determined not only by anthropogenic influences but also by unavoidable long term exogenous and endogenous natural processes, often with some hierarchical periodicity of significant change [6, 7], usually accompanied by unavoidable natural disasters beyond any human control. The most significant of these events are often beyond the reach of any human memory.

Geoethical issues are to be preferentially applied for assuring a fair co-existence of mankind with the abiotic Nature and for trying to minimize potential damages with a high level of responsibility. From this point of view some oversimplified "sustainable development" ideas can finally appear as unsustainable because of not taking into consideration all possible unavoidable disasters caused exclusively by the processes in the Earth crust [7]. Geological factors need to be reflected and respected in any concept of environmental sustainability.

Conclusions

Geoethics as a new discipline at junction of earth sciences and ethics tries to help in solving problems how to optimize the needed geoethical consumption of mineral resources in the Earth as well as how to face extraordinary intensive natural hazards and disasters. (The described goals do not express the large spectrum of geoethics.) Any citizen on Earth has to permanently improve by an appropriate up-to-date geo-education any knowledge of the behavior of the Nature (including its predictability). The needed geoethical way of thinking and acting should be based on generally accepted moral and ethical principles achieved by mankind by various ways and experiences (in spite of some current contrary trends). It is necessary to seek new priorities more and more emphasizing the solidarity of human kind.

APPENDIX:

GEOETHICS: HISTORY AND FURTHER DEVELOPMENT

Problems of ethics and morality can be retrospectively followed in the history of human kind to its earliest phases. The new scientific discipline of GEOETHICS since 1991 has brought to the attention various topics of Earth sciences needed to be discussed from new specific ethical points of view (e.g. prudent consumption of mineral resources). The present frequency of natural disasters all over the world gives serious

signals for intensifying an appropriate geoethical discussion. Significant events in the development of geoethics during the last 20 years include: international meetings organized since 1992 usually in 2 years terms as part of the Mining Příbram Symposia (Czech Republic), regular forums at all International Geological Congresses since 1996 (individual papers already in 1992) and formation of the Working Group on Geoethics in 2004 under the umbrella of the Association of Geoscientists for International Development (AGID) as well as establishing AGID National Chapters in several states (e.g. in Spain web pages http://tierra.rediris.es/Geoethics_Planetary_Protection/ with all GEOETHICS NEWS issued since 2007).

Geoethical principles and geological factors are to be considered in any scenario of a “sustainable development”. At any responsible level of state authorities and self-governments as well as in any context of international co-operation, geoethics might be able to help in paving a better way for the needed understanding of nature by human kind. Geoethical principles (the planet Earth = absolute value of the life; principles of respect, interdependence, harmony and balance of interests, responsibility to future generations, prognosticating, precaution, reversibility, integration, frugality etc.) should be incorporated in the optimal way into the consciousness and life of the contemporaneous global society.

In October 2011 at Příbram the future main trends were agreed in the **INTERNATIONAL DECLARATION ON GEOETHICS**:

- 1) significance of geoethics in the context of facing extraordinary natural hazards and disasters in the course of recent years;
- 2) geoethical approach to needed new legal aspects (including insurance policy) and to an ethical way of thinking;
- 3) links of geoethics with new aspects of geosciences education;
- 4) inclusion of geoethical subjects into deontological codes;
- 5) liaison with mining engineers and their activities;
- 6) need of searching new priorities for the 3rd millennium fitting the World Millennium Goals;
- 7) links for incorporating geoethics into any activity related with the abiotic world.

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