BIOMEDICAL AND ECOLOGICAL CONDITIONS IN THE CREATION OF BIO-ENVIRONMENT

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I. Sick-rate diversification and its dependence on people's location

Systematic statistic and epidemiological research conducted in many countries within the framework of the World Health Organization shows an essential connection between the sick rate expressed in the number of ill per 100,000 inhabitants and the kinds of diseases and the geographical position both in the scale of the planet, the continent, the country, the region, the chosen settling zone/town, district, quarter/ and even a single building. These differences along with the ever-increasing number of individual cases with respect to the time factor expressed with the multiplication factor of sick rate cases for the same type of disease are constant, especially if one considers small settling areas such as town, district, quarters and even houses.

The most characteristic and best-documented testimony to this state is the statistics data resulting from the morbidity research for cancer and among them lymphatic leukemia. By comparing the data from the rest of the planet, the coefficient of the death rate for cancer per 100,000 inhabitants between continents investigated in the years 1950-52 and from 1970 until 1980, one can see the difference to be:

- in case of lung cancer and afflictions of the trachea and bronchi, over 14 times greater in Europe than in Africa;
- in case of breast cancer, over 10 times greater in Europe and the American continent;
- in case of leukemia, over 14 times greater in the ratio of Europe-to-America than Europe-to-Africa.

In case of other cancer afflictions, the differences in the sick rate between countries and continents range from a factor of two to eight. From an analysis of the data of the World Health Organization from 1961-63-a characteristic time interval of the postwar concerning the average death rate for leukemia per 100,000 persons-it is evident that among some groups of countries there may exist a 4 times bigger mortality. Among the RSA, Egypt, El Salvador, Guatemala, Mexico, the Philippines and Denmark, Sweden and other European countries it is 8 per 100,000 persons. Whereas for the mortality coefficient for the malignant diseases of lymphatic and hemopoetic systems cancer, data of the WHO for West Berlin and Denmark in comparison to Venezuela and Japan is almost 5 times higher. Lung cancer is 6 times more frequent in Great Britain than in India.

The fluctuation of the sick rate coefficient in the U.S.A. depending on the geographical area and according to the data from 1972 is about 20 times higher in the District of Columbia (640 per 100,000 persons) than in the lowest, Alaska, which has 63 cases per 100,000 persons. In Czechoslovakia, epidemiological research has been carried out by the Oncological Clinics in Olomuniec. They concern morbidity and the territorial placement of the registered cases of malign cancer. They displayed a difference from 2 to 12 times in the quantity of the identified cases of the sick rate between the neighboring buildings and even parts of the same house. The data about identified sick rate cases and death cases, according to the current and archival information from the period of the last 100 years, were marked on the map of town development.

In Poland pioneering research has been undertaken on the sick rate and territorial placement of all types of leukemia. The region investigated in detail was the Cracovia region and the very city of Cracow in the years 1951-60 and 1961-68. The general sick rate coefficient of leukemias of all kinds for the years 1952-60 for the town of Cracow-4.79-was twice as high as in the village Limanowa (2.21) and the district of Brzesko (2.21). Similar differences in the data of the years 1961-68 appeared between the coefficients in the districts of Zywiec (3.67), Proszowice (3.39), MiechÆw (6.17), Tarnowska Dabrowa (6.93) and Cracow itself.

The increase of acute leukemia between the periods 1951-60 and 1961-68 was fivefold in the district of Brzesko (rising from 0.5 per 100,000 to 2.72), sixfold in the district Dabrowa Tarnowskam (0.62 to 3.75), and sixfold in Limanowa, rising from 0.44 to 2.67. A characteristic dependence was discovered: namely, that the villages where the cattle in the compound suffer from leukemia, also witnessed a higher sick rate of the same disease among people.

In the township of Cracow some differences in leukemia with respect to location have been observed in the years 1961-68. The leukemia rate varied depending on the different town regions and ranged from 3.44/100.000 persons in the district of Nowa Huta to over 9/100,000 persons in the district of GrzegÆrzki, a difference factor of three.

There is certain correlation between discovered anomalous and natural radiation zones and cases of leukemia. Besides the quoted research

results, a significant discrepancy should be noticed in the rate for atherosclerosis, brain diseases and heart failure depending on the geography of the habitat.

On the basis of an analysis of the data for the period 1900-1978 from the yearly publications of the W.H.O. in 1980, one can observe the general world tendency of an increase in the mortality coefficient for cancers. For instance, that increase in Denmark was only twice higher while seven times higher in Hungary. It may be noticed that there exists another tendency in levelling the maximum ratios of these coefficients between particular countries. A ratio of 1 to 6 between Denmark and Portugal in 1900 to about 1 to 2 in the 1980s as well as the ratio between Scotland and Japan are extreme examples.

These changes probably occur under the influence of unifying of dynamically acting civilizing factors connected with technical progress, industrialization, environmental pollution, diet chemicalization of food, the international exchange of food becoming a way of life. These factors often distort the picture of the natural environment's influence.

Especially within recent years, after 1986, in the result of the nuclear reactor disaster in Chernobyl and the contamination of the environment with ionizing radiation, indicators concerning the mortality and morbidity began to change very much. It especially refers to populations of eastern and central Europe. At the same time, in parts of certain areas on our globe we can observe the phenomenon of longevity and the generally very good state of health of the essential parts of the population living there. Those areas are defined as very healthy, classical examples here being Adhazja in the Soviet Union and the Kashmir Valley.

In Poland one can also distinguish areas of a favourable influence on the human body. These areas have been known for years for the location of resorts and climatic treatment of some specified diseases and from the influence on the general regeneration of vital forces. We can list the places of early Slavic settlements with places of worship around the Sleza Mountain, St. Cross on the Wolin Island and also such well-known resorts as Ladek ZdrÆj, Kudowa, Duszniki, Planica, NaleczÆw Krynica, Rabka, Zakopane, the Pieniny region and the seaside of Sopot, Leby and Miedzyzdroje.

Knowledge of the above dependencies will make future planners, urbanists and architects chose proper regions for towns and housing estates. On the other hand, fighting the diseases mentioned above will be more effectively accomplished by making changes in the environment.

II. Environmental sick rate coefficient: ecological conditions

Much research on the territorial placement of disease and its genesis corroborates the ecological conditions of sick rates and the premature death of inhabitants. In the case of cancer it is said that in 80% of all cases local ecological conditions are the source of these dangerous diseases. According to Professor J. Aleksandrowicz, we relate the activity in the environment by considering the cosmosphere, geosphere, biosphere and also the technosphere, sociosphere, psychosphere, where the physical, chemical, biological sick rate factors are important. He particularly points out the question of the so-called geography of diseases generated by the influence of food, water, and trace elements contained in the soil. Their deficiency or excess in the human body can cause diseases of brain, blood, heart, blood circulation system and cancer.

In his numerous works, Professor Rene Truhout, the founder of ectoxycology, was attentive to the problem of toxic reactions to chemical substances contaminating the environment. They are the cause of many diseases among the population inhabiting the contaminated areas.

Dr E.G. Peeters introduces a new discipline-geocancerology-which he defines as a discipline dealing with the complex of reactions and the contiguity among geography-in a very broad meaning-humane ecology, environmental factors, cancerology and all corresponding sciences. His factors discerning qualification of the cases of cancer can be applied to the analysis of environment conditions of other diseases.

For the needs of town and country bioplanning, biourbanistics and bioarchitecture professor M. Twardowski discerned 3 basic groups of environmental factors:

- biotechnical factors,
- physical factors,
- natural factors.

The most important item here is the homosphere-the space in which a human lives. In the case of the natural environment's influence and action, it may be assumed that there is a general division of pathogenic factors on the basis of their origin:

- biological-the fauna and flora,
- geochemical-the chemical constitution of soil, water and air,
- geophysical-the geological structure of soil, anomalous EM and ionizing fields, meteorological influence

In bio-urbanistic and bioarchitecture planning in Poland the following environmental conditions are taken into account:

- light, climate, insulation, ultra-violet irradiation, and color influence,
- the acoustic climate,
- the thermic climate,
- the aerodynamic climate,
- the isobaric climate,
- the chemical pollution of air,
- hipsometry,
- the landscape arrangement, protection of natural environment, forests, park areas etc.,
- and the physiography and geology, the kinds of soil, structure of geological strata, localization and level of ground water.

Recently some questions of psychology of architecture have been taken into account. The psychology of architecture is a new branch of knowledge connected with planning of bio-urbanistic and bio-architectual arrangements as well as interior planning of offices, places of rest and homes (Twarowski).

From among many problems connected with the natural factors of the environment, special attention should be paid to hardly perceptible ones in planning and building cities, industrial districts and housing areas and the bio-energetic action of natural geophysical environment. In many cases it has an essential influence on inhabitants' health. The author initiated the creation of systems of regular geobiophysical measurements for the need of bioplanning cities and housing areas. The basis of 10 degrees on the B.I.O. scale was used in evaluating the intensivity and quality of the action and effect of bioenergetical fields-the so-called geopathic zones. These research works complement environmental monitoring and the ecotoxycological evaluation of the pollution of the alimentary canal (Dobrowolski) in regions of strong influence of industry.

III. The present situation in geobiophysical conditioning in bio-urbanistics and bio-architecture

At present we can differentiate three basic sections of the research design works leading to the creation of a healthy housing bio-environment with the influence of geobiophysical factors taken into consideration. The first section investigates geobiophysical conditions, embracing the:

a. Localization on the investigated area's anomalous natural energy fields, negative and positive fields and pathogenic and healthy zones.
b. Evaluation of the degree of their biological harmfulness.
c. Preparation of the localization guidelines and geobiophysical maps.
d. Choice of the suitable sites for housing development.

The second section involves the creation of the functional, territorial conception of a bio-estate on the basis of the guideline localization from the first stage. The third section is the functional, territorial and technical formation of the bio-architectural structure and the interior, including the biological harmfulness of the energy field acting inside the designed space where there exist significant basic factors influencing the parameter of this resultant field such as:

- the localization and the geobiophysical conditions,
- the shape and geothermic influence,
- the lighting and natural and artificial insulation,
- the material and the type of construction,
- color,
- technical equipment,
- the duration of influence,
- and the occupant.

IV. Tasks in forming the bio-environment

The final aim in forming the bio-environment is the creation of the most advantageous conditions of life protection and proper development of all inhabitants on the following levels:

- psychical,
- intellectual,
- physical,
- cultural,

as well as the creation of good conditions for mental development.

Reconnoitering and localizing negative, pathogenic zones and positive, healthy zones. This will force planners to position cities and districts in areas with the best living conditions. This fact should primarily be taken into account in continental and global planning.

To evolve methods of best using areas without devastating them it is essential to introduce rules of using areas in order to protect their greatest environmental values.

V. Ways of performing the tasks along the lines of the International University for the Bio-Environment

- Creating bio-planning, bio-urbanistic and bio-architecture departments.
- Creating an information system about environmental risks being within this range of knowledge (see Section IV) according to specific departments.
- Making a plan of literary output.
- Forming interdisciplinary subjects.
- Interdisciplinary planning connected with the creation of a healthy bioenvironment locally, domestically, and continentally, and didactic activity connected with it.
- Popularization and sponsoring of research works dealing with protection and creation of healthy bio-urbanistic and bio-architectual environments.
- Intervening in dangerous cases and situations.
- Creating the possibility of international research and the exchange of assistants and scholarshipholders.
- Postgraduate education-permanent and summer courses according to confirmed education programmes.

VI. The prospects of cooperation between the center for building biology and environmental energy action and the I.U.B.E.

- Participation in inter-disciplinary analyzing teams regarding the quality and intensity of environmental factors in action in order to make judgments about the quality of bio-environment, as well as reports and biological, geochemical and geophysical maps which are initial materials for spatial bio-planning and designing of optimal bio-urbanistic and architectonic systems. The drawing of relationships between the bio-energetic actions of geopathic zones and the health of inhabitants could also occur.
- Cooperation in designing towns, resorts and bio-environment, taking into account the action of natural energy fields.
- Carrying on research and educational activities in the form of TV films and publications about locating Greek towns in healthy areas-a historic view.
- Separation of regions of the best geobiophysical conditions for locating new towns and housing estates in Greece.
- Didactics-exchange of experiences in the field of shaping bio-environment with special consideration given to geobiophysical factors.
- Inaugurating a monumental objective in Poland for the needs of the university, after providing the necessary adaptationsöfor example to carry on research, design and didactic work, conferences and activities of the section of spatial, bio-urbanistic and bio-architectonic bioplanning.

Edward Kamienski, an engineer architect, received his M.Sc. from the Technical University of Cracow, Poland. In 1988 he founded the Center for Building Biology and Environmental Energy Action (BIOSKALA), Cracow, where he is now Director. He has won prizes in numerous architectural competitions organised by the Polish Architecture Association, and has experience in designing abroad. He has participated in international conferences in Poland and abroad. Among his more important designs are districts for 7,000 inhabitants in the city of Cracow, a sanitorium, schools and geo-biophysical research for houses and districts.