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INNOVATION – EMERGENCE – PHILOSOPHY OF HISTORY: ARE THERE ANY AREAS OF INCREASED PROCESSES OF EMERGENCE AND INNOVATION IN THE GEOGRAPHICAL SPACE?

Summary. The processes of emergence of human qualities and innovation are closely linked to the spatial order. Historically, the emergence of anthropological features precedes innovation processes. Naturally or intentionally created polycentric spatial order is conducive to the emergence and innovation processes.

Keywords: innovation, emergency, genetic focus, geographic space, neolithic revolution, industrial revolution.

INNOWACJA – EMERGENCJA – HISTORIOZOFIA. CZY W PRZESTRZENI GEOGRAFICZNEJ WYSTĘPUJĄ OBSZARY INTENSYWNYCH PROCESÓW EMERGENCJI I INNOWACJI?

Streszczenie. Procesy powstania ludzkich cech i innowacji są ściśle związane z łaodem przestrzennym. Historycznie, pojawienie się cech antropologicznych poprzedza powstanie procesów innowacyjnych. Naturalnie lub celowo stworzony policentryczny łaod przestrzenny sprzyja procesom powstawania i innowacji.

Słowa kluczowe: innowacje, emergencja, miejsca na ognisko genetyczne, przestrzeń geograficzna, rewolucja neolityczna, rewolucja przemysłowa.

1. Innovation and emergency

Innovo means in Latin *to renew*, and the term of *innovation - renewal*. If you understand this term literally, innovations will consist of the renewal, improvement of existing things. Things occurred for the first time would not be innovations. Latin language also knows the verb *emergo* - to emerge, to appear, to bring out. From this comes the concept of the

emergence. Etymologically, the word innovation is therefore a renewal, or more broadly the change of the things which already exists, while the emergence means the formation of completely new things, in other words the creation of new quality.

However, established linguistic habit demands different way of distinguish these two concepts. The innovation refers to the creation of a conscious human works, whereas the emergence concerns creation of new quality which is visible in the nature. In the social life it refers to the quality which is independent of human will and awareness. Consequently, the innovation is a technical invention, a work of art, new fashion, creation of neologism or new understanding of the word existing in the language. The appearance of a new quality when connecting two elements in a chemical compound, a process of biogenesis, speciation, ethnogenesis or sociogenesis is called the emergence.

The conception of the emergence has been originally used in chemistry. Based on the properties of the constituent elements, you cannot explain the characteristics of these newly formed compound. Subsequently, the emergence found an application in other natural sciences: biology (especially in the theory of evolution), physics, cosmology, and finally also in anthropology, sociology, economics, linguistics and other cultural sciences.

However, both ways of understanding, etymological and real, are often used together. The human mind by its nature is not be able to create completely new things. Conscious creations of mind and its practical application may be only innovation. On the other hand, phenomena and processes independent of human will, forming spontaneously, may be emergent.

In this article, I will limit myself to the analysis of the innovation and the emergence occurring only in the broadest sense of the anthropology. Thus, I'm interested only in the emergence processes such as the human evolution, the racegenesis, the ethnogenesis, the glottogenesis (origin of languages) and the sociogenesis. In each of these processes there is an emergence, but it is difficult to talk about innovation.

The question is what relationship occurs between periodically limited emergence and being conscious human activity innovation. If they are dependent on each other, there must be temporal and spartial relations between them. In this article I am going to consider whether there are any places and periods where innovations appear on a massive scale and led to the emergence, or vice versa, emergence led to the creation of innovation. Besides, both types of this processes may be interdependent. So we can distinguish three types of relationship between emergence and innovation:

1. innovation is preceded by emergence;
2. the emergence is preceded by innovation;
3. emergence occurs simultaneously with innovation.

I assume that humanity evolves in the specific kind of "space-time" called the geographical space and that this fact is not without significance in terms of the relationship between innovation and emergence. Mutual sequence of innovation and emergence can occur

only in the case of the proximity of people in the geographic space. This fact cannot be changed even by technological advances in communication because with the evolution of the geographical space the concept of proximity is changing. To explain this you need to define a term known as the geographic space.

2. The geographic space and emergence

Geography treats the geographic space as a two-dimensional or three-dimensional segment of the physical space. In the first case, the geographic space is identified with the surface of lands and oceans. Secondly, it is understood as a non-convex figure surrounding deeper "rest" of the Earth which is located, for example, between the tropopause in the atmosphere and the Moho discontinuity¹.

The concept of geographic space used in this article differs from the traditional conventions. It is associated with a specific layer of the organic life. This layer in fact, but not a physical layer – constitutes this space². Geographic space is not a part of the physical space. It is associated with an evolving life, so it is *sui generis* reality. This allows you to understand it not geometrically, but processually.

In order to new define of the geographical space it is necessary to assume the existence of specifically geographical reality, different from the physical layer. This can be defined as a *sequence of specifically geographical behaviours*. The specifically geographical behaviours are some kind of the functioning of living organisms including man, which can be identified with the geographic space. They have the following properties: occur only within the geographical space in traditional sense and do not have some of the characteristics of behaviour examined by psychology (for example, are not reactions to stimuli and are not due to genetic factors). In other words, the specifically geographical behaviours form in the organic world (and therefore also in the human) a geographical space, which is understood as a developing process.

I assume that the specifically geographical behaviours by its essence cannot take place outside the geographical space. Traditional behaviours studied for example by behaviourists, can take place anywhere, even on another planet or in a spaceship, whereas the specifically geographical behaviours are located in the geographical space. Category of spatial location is a category of space, but it is different from the physical space. Physical phenomena are not localized which mean that they take place in the same way in every place and time in the Universe. Traditionally understood behaviours which appear in psychology and

¹ Kalesnik S.: Podstawy geografii fizycznej. PWN, Warszawa 1975, p. 10-16.

² Wiernadskij W.I.: Biosfera. Izbrannye trudy po biogeohimii. Mysl, Moskwa 1967, p. 352.

psychosociology are non-localized too. Take as an example E. Hall's proxemics³. Distances between people described by proxemics - intimate, personal, social and public are not significantly related to the place in which occur, in particular to the geographical space. People behave in a similar manner in any place in the Universe, even in a spaceship or on another planet.

Specifically geographical behaviours are new, not yet sufficiently conscious by science field of phenomena. They cannot be reduced either to the physical world, nor to the organic ones. Significant thing is that examples of these phenomena are the emergent processes cited above. It's hard to imagine allopatric speciation, racegenesis, ethnogenesis, glottogenesis or formation of the global village taking place outside of the geographical space or occurring in this space in a chaotic manner, not related to its order. This space is not only seen as a place where they occur, but also as their mechanism.

Is it a coincidence? Phenomena or specifically geographical behaviours form the geographic space understood as a process. So there are changes taking place in this space, consisting of its evolution, extending according to the spatial (geographic) regularities. You can interpret it in a way that the geographical space creates and converts the organic being layer, with superstructured on it anthropological reality. The emergence of species, races, languages, ethnic groups takes place within certain spatial structures and in accordance with spatial regularities. So understood emergence is as much an organic or anthropologic process as an geographical. The evolution of the organic and humanity worlds is an evolution of the geographical space. Specifically geographical behaviours are phenomena of the emergence - the emergence of new races, languages, ethnic groups.

3. Focustion and diffusion as categories of the geographical space

Emergence of new anthropological qualities is therefore connected with order of the geographical space. It occurs in some distinguishable areas of Earth, called focuses. It can be explained by example of the racegenesis, which is a typical case of emergence of some anthropological features connected with the structures of the geographical space.

W.P. Aleksieyev developed the theory of the racegenesis in his work *Geography of Human Races* published in Russia in 1974⁴. Russian anthropologist talks about the concept of anthropological layout: "For the denotation of the humanity as a whole, which is manifested not by the great social phenomena, but which is the sum of biological entities, is better suited to the concept of layout, as yet not used in anthropology"⁵. This statement reflected the idea

³ Hall E.: Ukryty wymiar. Muza, Warszawa 2005.

⁴ Aleksiejew W.P.: Geografia ras ludzkich. PWN, Warszawa 1979.

⁵ Ibidem, p. 85.

that social reality is different from the more original, both in terms of historical and ontological, geographical and anthropological realities. According to Alekseyev's theory, anthropological concept of layout is close to the concept of the geographical space.

The anthropological layout belongs to the specifically geographical reality and creates such spatial structures as focuses of the racegenesis and clines. Moreover, focus of the racegenesis is a geographical concept. Aleksieyev writes: "The discontinuous nature of anthropological layout, especially in the early stages of the racegenesis, was caused by the local feature of the impact of the racegenesis' factors, also limits any racegenetic situation to the specific spatial framework. This frameworks were the more narrow the more often followed a break in relations between populations, and hence, when they were stronger genetic barriers. On the contrary, these frames were quite extensive when anthropological layout was continuous"⁶. Focus of racegenesis appears therefore as a specific disorder of the continuity of the anthropological layout, or in fact disorder of the geographical space, understood as a sequence of specifically geographical behaviours.

In the racegenetic foci process of the racial formation is correlated with the development of other anthropological features such as ethnicity and languages. Thus, they are emergence's places of various anthropological features of a particular severity. It is difficult to imagine the formation of races, languages and ethnic groups across the anthropological layout on the large, undifferentiated space. This processes by their very nature are limited to small areas. Similar intuitions lie at the root of the evolutionary punctuated equilibrium theory: in this case speciation was seen as a process taking place in a small area too⁷. In my work "A dispute over the geographical determinism" I called foci in which the synchronize of the new human features occurred as genetic foci. This name comes not from genetics, but from the genesis, origins of new biological and cultural features⁸.

After formation of the specific anthropological feature, it "spilled out" through the space to the other areas. The frequency of the appearance given feature decreased with the distance from the place of its origin. Used with the focus term of the cline means a gradual change in the racial features, their spatial gradient⁹. In the 60's of the twentieth century the conception of cline in the anthropological literature was as often used as the very concept of race¹⁰. Cline should not be opposed to the focus, but rather treat it as its temporal and spatial succession. It is evidence that the diffusion of products of genetic foci in geographical space, often takes place after its collapse.

⁶ Ibidem, p. 90.

⁷ Gould S.J., Eldredge N.: Punctuated equilibria: the tempo and mode of evolution reconsidered. *Paleobiology* 3 (2), 1977.

⁸ Mikołajec J.: Spór o determinizm geograficzny. Wydawnictwo Politechniki Śląskiej, Gliwice 2013, p. 155-159.

⁹ Livingstone F.B., Dobzshansky T.: On the Non-Existence of Human Races. „*Current Anthropology*”, Vol. 3, No. 3, 1962.

¹⁰ Ibidem, p. 300.

4. Evolving geographical space and the relationship between emergence and innovation

Although specifically geographic phenomena are universal, however, according to the fact of the interaction of the various living structures' layers, do not always manifest themselves with equal clarity. In the case of human, they are suppressed by the phenomenon of a different type, namely the ones that are not specifically geographical, especially sociological. One of the most significant features is the fact that they are most clear at the periphery of the expanding civilization, both in terms of time and space, while in the centre are obscured by other events and are therefore poorly recognizable. It is not a coincidence that increased racegenesis correlated with the emergence of other human features, both biological and cultural, took place in the Paleolithic, and today is almost expired.

The structures associated with a highly developed civilization suppress the processes of emergence. Migrations, race-mixing, unceasing social and technological changes are not conducive to the development of such processes as the racegenesis or the glottogenesis. Languages are still evolving and others are being created, but it is got nothing to do with the original glottogenesis, which was an emergent process. In the Paleolithic the emergence of language was to form a new quality of the culture. Modern development of new languages (not keep up with the disappearance of already existing) are only innovation, transformation of existing structures into the new ones. Similarly the processes of the mixation and mestization, i.e. the formation of mixed races should not be confused with the original racegenesis.

If the innovation processes are part of a conscious human activity, they are associated with the sociological and psychological levels. They are then, at least in the time scale in relation secondary to the process of emergence. This suggests a certain polarity, and also their temporal succession. This polarity is "parallel" to the opposition of the specifically geographical and sociological phenomena. This way the emergence creates some anthropological structures. It is only within these structures can form innovations. In this sense, from among the three above suggested the possible relationships between the emergence and innovation, true is the first of them: the emergence precedes innovation.

However, can it be true that periods of increased innovation were not connected with specific areas of the Earth's surface, as it did in the case of emergence that occurs in the genetic foci? Regarding the technical inventions they were two such periods: the Neolithic Revolution and the Industrial Revolution. Inventiveness during the contemporary ongoing informational revolution is not as nearly correlated with certain areas, as was the case in the two previous technological revolutions. This may be related to the creation of the global village, a specific unification of humanity and shaping the entire geographical space as one space.

Neolithic Revolution is usually treated as concentrated in certain areas and periods process which led, through domestication of some amount species of plants and animals, to the emergence of agriculture. But this is not the only field of this changes. It is also the technological, urban and demographic revolution. All these fields of the Neolithic Revolution are not separate, but interpenetrate each other.

There were several areas of increased domestication of plants and animals, operating mainly in the Neolithic period. Neolithic (like other prehistoric cultural periods) is not continued simultaneously, synchronously throughout all the Ecumene¹¹. Most, as well as the most relevant plants and animals, were domesticated in the area of the so-called Fertile Crescent, about 9-6 thousand years ago. It stretches in the Middle East like an arc from the Levant, through the mountains of Kurdistan to Mesopotamia. Wheat, barley, peas, olives, sheep, goats and other species were domesticated in this area¹². From the area of the Fertile Crescent, in the few thousand years, cultivated species spread in all directions: through the Balkans to Western Europe, eastward to the coast of the Pacific Ocean, through Egypt in the direction of the Trans-Sahara Africa. The Neolithic Revolution was accompanied by a demographic explosion that caused the migration processes on a large scale. Diffusion of innovation in geographical space was accompanied by migration of the people.

The second great historical technological revolution was the Industrial Revolution. During this revolution, there were great changes in technology, which entailed socio-cultural changes that led to the emergence of modern society. Specific time limits of the revolution depends on the convention, but its peak happen on the last quarter of the eighteenth century and the first quarter of the nineteenth century. This revolution was initiated in England and Scotland, where its achievements spread to the rest of Europe, to the North America and other continents. It is worth noting that in Europe the spread of innovation directions in the case of the Neolithic Revolution and Industrial were opposed, although in the latter case it was not accompanied by migration's processes.

C. Lévi-Strauss assigns a significant part in human history both of these technological revolutions. Between them stretches a 9 thousand years break¹³. Examples of the Neolithic and the Industrial revolutions show that not only the emergent processes, but also the intensification of innovations in agricultural and industrial technologies, was associated with certain areas, which may be called "embryonic". This does not however associated with the evolution of the geographical structures in the sense used in this article. The emergence of agriculture in the Neolithic is a later process than the Paleolithic racegenesis and glottogenesis. Neolithic and modern technological revolution are at most geographic phenomena in the traditional sense, but not specifically geographic.

¹¹ Diamond J.: *Strzelby, zarazki, maszyny*. Prószyński i S-ka, Warszawa 2000, s. 87-101.

¹² Barker J.: *The Agricultural Revolution in Prehistory. Why did Foragers become Farmers?* Oxford University Press, Oxford 2006.

¹³ Lévi-Strauss C.: *Antropologia strukturalna, t. II*. KR, Warszawa 2001, s. 373-380.

Does it mean the absolute end of the specifically geographical structures such as Paleolithic genetic foci? There is a suspicion that emerged as a result of the information revolution, global village has some features of traditional genetic foci, and even may be considered as a "late" focus. This term comes from a Canadian sociologist and theorist of the electronic media M. McLuhan. As a result of migrations and technological progress have been broken genetic foci. But these same processes lead to the unification and consolidation of the humanity in the global village. Today, the observed processes such as mixation of races, cultural unification, desocialization lead to originate of the new spatial structure, similar to the primary foci. It is identical with the entire geographical space, is its late form.

Analyzing the problem of emergence and innovation, we are dealing here with a reversal of the original dependency. While originally, in the process of leaving the Palaeolithic foci and the creation of technical civilization, the innovation was preceded by the emergence, then in the process of creating a global village the emergence is preceded by the innovation.

5. The idea of the cluster, and the problem of the innovation and emergence

In the analysed case of anthropogenic spatial order you can see classic, repeated many times oppositions: locality-globality, centre-periphery, polycentrism-monocentrism. The last of these opposition occurs at many levels of spatial order. Origin in one place a single urban centre may be a coincidence, but the emergence of multiple centres within near distance from each other cannot be accidental. It follows that polycentric order is more primary and more basic than the monocentric ones. It is also more independent from the arbitrary decisions of men. Polycentric systems, as not create by accident are closer to the "logic" of the natural spatial order than monocentric.

Network of relatively isolated from each other Paleolithic genetic foci is an example of a polycentric structure. Today an emerging global village is monocentric. An example of the polycentric spatial structures can be classic mining conurbations, agglomerations of health resorts (a special case of the mining conurbation where raw materials are mineral waters), conurbations of port cities, groups of cities in agricultural regions of Asiatic mode of production (Indus Valley, southern Mesopotamia). Specific "conurbations" in the microscale can be spatial agglomerations of monasteries (Mount Athos), entertainment districts of big cities, and finally clusters and technopolises - the agglomerations of scientific institutions and industrial companies.

The idea of the cluster is an intentional imitation of the polycentric spatial order. Cluster is an invention based on the observation of existing spatial structures¹⁴. The predecessor of the theory of clusters was British economist A. Marshall (1842-1924). Marshall was a pioneer of

¹⁴ Mikołajczyk B., Kurczewska A., Fila J.: *Klasy w świecie. Studia przypadków*. Difin, Warszawa 2009.

research on the spatial economies. He analyzed the tendency of British companies to locate in industrial areas close to suppliers, customers and competitors. Moreover he created the concept of external economies of scale¹⁵.

A typical representative of the modern theory of clusters was American economist M. Porter (born 1947). The most famous cluster is Silicon Valley located near San Francisco, California, but clusters can be broadly understood in many parts of the world. M. E. Porter considers that clusters were always in the world, regardless of the current economic systems and the level of economic development¹⁶.

The task of clusters is the geographic coordination of production and inventiveness in related economic sectors. Activities within clusters gives businesses many benefits and increase competitive advantage. If the creation of inventions and their implementation is the main task of the clusters, they are spatial innovation systems. In case of spontaneous, natural or unconsciously constructed polycentric spatial systems innovation is preceded by emergence. Systems of industrial clusters, however, are artificial designed to generate innovation.

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Omówienie

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