

Natural and social sciences have to merge? A view from Russia

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ABSTRACT

The UNESCO's Social and Natural Sciences Councils launched a process of the merging of these two Councils aimed at enhancing interdisciplinary research and education. The paper based on some inquires in the history of science, the author's long-term experience of participation in the UNESCO's 'Man and the Biosphere' program as well as on some current international interdisciplinary research and developments, analyses the state of affairs in this realm, the impetuses and impediments of the merging process. The author came to conclusion that: (1) it's not a volitional decision but a reaction on integrating processes embracing all forms of human activity stimulated by the Fourth industrial revolution and rapid development of the information-communication systems embracing all spheres of human activity; (2) this revolution makes our life and its environment more 'compressed' and interdependent; (3) we are now in the zenith of technocratic aspirations and predominance of socio-constructivist viewpoint on social and natural processes; (4) some major research findings age gradually replaced by 'dramatized' and short-lived news produced by media; (5) global dynamics outstrips research-and-development processes; (6) the objective processes of sciences merging and a tough market competition clash with each other.

Keywords: globalization, Fourth industrial revolution, interdisciplinary project, media, natural and social sciences merging, Russia

METHODS AND TECHNIQUES USED

Desk research of the history of social and natural sciences development; reflection on the author's personal participation in international long-term and interdisciplinary research projects; an analysis of the case-studies of current environmental projects in Russia and abroad; in-depth interviews with Russian scientists and scholars.

INTRODUCTORY REMARKS

In October 2017, the members of World's leading bodies of social and natural sciences gathered in Taipei (Taiwan) took a historical decision: to merge the UNESCO's Councils of Natural and Social Sciences in 2018, shaping the International Science Council to serve as a global voice for science, as it has been said in the communique of the International Social Science council of the UNESCO. As a former member of the UNESCO's 'Man and the Biosphere Program', and the co-leader of its international project 'Cities of Europe: Public's Participation in the Shaping of Urban Environment' (Deelstra and Yanitsky, 1991), I may state that this process has a long-term history. Even in early 1980s, the team of Australian sciences and practitioners had got very promising results in the matter of cooperation between sociologists, natural scientists and experienced rank-and-file people. The participants of the 'Cities of Europe...' project from both capitalist and former socialist countries clearly showed that joint efforts of various disciplines and grassroots is not only possible but has very positive results for urban residents, grassroots activists and scientists (Hackney, 1991; Saeterdal, 1991; Krantz, 1991). Ten years earlier I'd tried to understand what the notion of eco-city had really meant (Yanitsky, 1982).

Speaking more generally, I'd say that relatively calm international relationships in Europe in those times stimulated the intensification of environmental and other forms of integrated research. It might appear strange to the young generation of scholars, but we, participants of the above project from 16 countries collaborate closely irrespectively of our citizen and ideological belonging. Environmentalism as an idea, concept and research technique showed us that we are all closely interlinked together. It has been a time when such concepts and terms as carrying capacity of environment, social and natural milieu as an actor, sustainable development have been understood as the markers of multi-disciplinary studies. It's rather indicative that in those times an informational accessibility, transparency was seen as a good and not a bad. At the same time, more deep insight into global development generated the concept of 'limits to growth' (Meadows et al., 1973; 1989). In one way or another, permanent and interpersonal contacts have promoted the establishment of interdisciplinary dialogue.

But today the situation is much worse. I see a set of substantial impediments which an integrated scientific community has to overcome in the process of establishing of mutual understanding and interdisciplinary dialogue. Let's analyze them one by one.

IMPEDIMENTS FOR NATURAL AND SOCIAL SCIENCES MERGING

The following considerations and conclusions are based on a set of sources, materials and methodological prerequisites. To my mind, a predisposition to integrated world perception and thinking is shaping in an early childhood when a child perceives a world as integrated whole. And then such predisposition may be maintained and strengthened by the life in a diverse immediate social and natural environment. I had a lucky chance to grow in very diverse 'big family' compiled from doctors, geographers, historians, geophysicists, engineers, polar researchers, naval pilots as well as from civil activists. It is rather important point because in spite of the fact that further education in secondary and higher school is still not problem-oriented but subject-organized the attitude to perceive a reality as something whole has been protected. Much later this viewpoint has been confirmed by the works of Z. Freud and his followers including Russian psychoanalyst, my Aunt Vera Schmidt who collaborated with S. Freud (Freud, 2002; Schmidt, 1924, 1926).

In my personal case the integrated type of perception of reality has been maintained by various sources. First, my 'big family' (including three Noble laureates) has existed more than sixty years. Second, this type of world perception is usually supported by various forms of avocations. In my very case, it has been an oil painting and especially landscape painting which went throughout my life. Landscape painting is very strong 'teacher' for perception of any reality as something integral and at the same time a changing whole. Thirdly, an urban planning has been my initial profession. To be an architect or urban planner means to master no less than 10 interdependent professions and skills. The very idea of joining of natural, technical and social requirements is imprinted in this complex profession.

Taking the issue in question in more general terms, the relationships between constructivism and evolutionism has been at the core of dialogue between social, natural and technical sciences. And there is an important 'meeting point' between them. Even if any participant of a dialogue is not well understand his/her opponents there is a very important result of such interdisciplinary dialogue: an emergence not only new notions and concepts but the rise of social movements for making a technically-constructed living environment more human.

Let me give two examples. In the mid1950s and onwards, the Soviet Union experienced a radical turn from individual construction of cities and apartments to industrial one. It had been not only an overall *perestroika* of planning and construction processes but radical turn in

minds of architects and city planners. An individualized, i.e. environmental approach to creation of a habitat (living areas) had been replaced by a necessity of strict following of thousands norms and instructions. Roughly speaking the architect turned into a follower of a set of protocols. A significant result: a life in such industrial urban milieu provoked a long-term grassroots movement aimed at turning such milieu into more habitual and human. That is, in a more integrated one.

The second example relates to changes in practice of medical treatment. In the past main instruments of such treatment have been anamnesis and medical examination. In very complicated cases a consultation of leading professional had been gathered. Nowadays, there are two another instruments of such treatment are used. It is a protocol and competence which, to my mind, are very contradictory. The former is algorithm to follow whereas the latter presuppose a mobilization of types of accumulated knowledge and practices. In essence the former is a kind of a command (an instruction) whereas the latter is a dialogue between a doctor and a patient that is the dialogue presupposed a kind of monitoring of an illness development. Let me remind that S. Freud, T. Parsons, E. Goffman, R. Fox and many other sociologists and psychologists had initially been the doctors.

For me, the work at UNESCO's headquarters and participation in its 'Man and the Biosphere' program has been a new step of extension of the 'big family' but family without borders. In those times that headquarters was a real melting pot of cultures and research schools. Environmental approach is efficient only then if it is fastened together by a community of diversified scientists and scholars united by holistic approach. Such community is impossible to construct, it could emerge only as a result of a long-term collective work on the same issue. This kind of convergence of natural and social sciences needs time for permanent communication. That is why the notions like the 'full time integrators' had emerged in the run of the above program. It is not accidentally the movement toward global human ecology had been called the 'winding road' (Buttel, 1986). As S. Boyden stated, in the relationships between the Biosphere and society one should take into account two adversarial processes, a biometabolism of society and technometabolism of it, and 'the concept of technometabolism is of the utmost significance' (Boyden, 1988: 79).

It is necessary to state that joint efforts of scientists, scholars, businessmen and public figures to launch the process of merging the natural and social sciences made in 1970-90s gave no practical results. There were a lot of world summits, conferences and research projects but without any institutional transformations. The trend of scholars and scientists separation began by the fathers of the Enlightenment has continued. It seems that such compartmentalization of the sciences has been peculiar to the institutional structure of the Third industrial revolution. But even earlier, in 1960s, the process of the emergence of the fourth industrial revolution has begun. Let's briefly consider the impetuses and obstacles of this double-sided process.

NEW MULTISIDED TRENDS AS IMPETUSES TO MERGE

First, it was a process of shaping of a global information-communication system by which our world has not only been tightly 'compressed' but has become much more permeable. The emerging network society works as a destructor of territorial boundaries of the nation-states and a diversity of local cultures. The mass migration processes across the states, continents and the world at large has been a reverse side of the same coin. Such mega-institutions as the European Union as well as micro-actors as local communities and individual social entities have been questioned.

Second, an intensive process of mastering of natural resources coupled with a massive production of the wastes has acquired a global scale and gradually turned our planet into a sociobiotechnical system (the SBT-system, Yanitsky, 2016). Micro SBT-system which I'd called as a primary eco-structure I tried to investigate empirically (Yanitsky, 2012). The structure and functions of this contradictory but highly-integrated system has not yet been well studied. In turn, it means that the existing view at our planet as an endless stock of resources is wrong. A feedback that is an impact of the above SBT-system on our life should be taken into account. In our times any 'environment' is an actor and this double-sided phenomenon should be carefully investigated. It means that a carrying capacity of each particular SBT-subsystem as the 'environment' is not constant. It depends on interactions of inner and outer forces.

Thirdly, these forces are not one-dimensional. For centuries the metabolic processes between natural ecosystems and man-made constructions has been going on. The result of these processes may be merging, repression or even annihilation of substances and systems involved. Anyhow, the metabolic processes are the basement of existence of all natural, social and technical systems. Besides, social metabolism as such is realized in various forms, say, political, cultural and social and always with unpredictable results. Nowadays, there are many international teams and group that study metabolic processes mainly with an accent on the processes of energy and resource production and supply (Haberl et al., 2016). But the key point is again a feedback that is an impact of global warming on social processes and structures, for example.

Fourth, it is the existence of social actors in two worlds, material and virtual ones. This means total transformation of all spheres of social life and the emergence of the phenomenon of an oscillation of humans between the two worlds and the making a behavior of individual and social structures unstable and therefore less predictable. An overall uncertainty of social life is growing. Then, the struggle between opened and closed network structures has begun. After then, an integrated scientific community has to do with highly flexible local-global phenomena. The question arises: is natural and social sciences are well-prepared to study this uncertain and highly movable social world?

Fifth and rather important issue is the phenomenon of doubling of politically-engaged knowledge. Today, the majority of the humanities are dealing with two different kinds of knowledge, gained in the run of research process and socially-constructed ones. For the reason of permanent fastening of social life the processes of replacement of scientific knowledge by quickly constructed social knowledge is growing. Here we again return to the question of tempo-rhythms of gaining of 'objective' knowledge under the process of very uncertain and permanently increasing speed of global dynamics.

Six, some natural sciences and less the humanities has already practice an interdisciplinary research and developments. Let me briefly count the spheres and conditions of doubled or multisided research and developments. First of all, it is medicine and biology because they are dealing with inseparable living organisms. Then, it is many civil and military industries in which integrated approach gives profit and other market priorities. Further then, it happens in critical conditions in which interdisciplinary barriers simply not taken into account. Now, under conditions of growing global competition we are all living in the atmosphere of mobilization of scientific researches.

Seven, the role of civil society organizations as an initiator and producer of interdisciplinary knowledge should be taken into account. To begin with, such disciplines as a history and an archeology are already integrated ones by definition. Then, modern scholars are widely use

methods of crowd-sourcing and crowd-funding for gaining necessary information or for charity activity. After then, many environmental organizations and movements participate in shaping of global political agenda. Finally, we are witnessing a new phase of cooperation between scientific groups and environmental organizations dealing with environmental issues of macro-regional and even of global scale (Simonov, 2016; Baikal Expedition, 2107). It means that civil activists with natural scientists are practically organizing and implementing an interdisciplinary research project of a global scale. The very name of international organization which E. Simonov coordinates is indicative: the 'Rivers without borders.'

Eight, the processes of integration of economic, political and civil activities has its shadow side. In essence, all forms and structures within any SBT-system are contradictory in their nature. It's a bit surprising that a dialectics of their 'goods' and the 'bads' using U. Beck's terminology has never been systematically investigated. All parts and processes within and beyond global world are not only 'interact' but 'struggle' for their survival and domination. The myriads of actors of the humanity cannot exist without using of energy and resources. This permanent open and overt struggle for energy and resources gradually transforms living areas into resource ones. The more easy accessible sources of energy and resources are shrinking the more often the struggle for them took illegal, criminal and armed forms. The back side of this struggle is the process of diminishing of any forms of cooperation activity. It fully relates to the processes of cooperation of natural and social sciences. The emergence of such arms as hacking, network trolling and bowling is one of the arms for destruction of virtual communities.

Nine, like the Biosphere global social community has now become very unstable and movable. These processes have two sides, positive and negative ones. The former is the more wide opportunities for getting job, education, rest, medical assistance, and so on. But it is only opportunities and not actual possibilities. The latter is the loss of his/her national identity and small Motherland, and the emergence of the layer of new type of marginal men, or in other terms, the 'men from a nowhere.' Under global conditions such notions as 'we' and 'they' are becoming relative. This super-mobility of mass people is high-risky ones because it is threatening the existing global social order burdened with reciprocal penetration of innovations and archaic. In sum, it is one more reason to develop new principles of relationships between social, natural and technical sciences adapted to movable and highly diversifies global social order.

Ten, it is a coincidence of two interrelated trends: the emergence of information society and the coming of a new generation grew on quite another, i.e. digital culture. It is well-known paradox: in the most developed countries a birth-rate is going down whereas in the developing ones it quickly going up. This gap has many positive and negative consequences. Following Beck's idea of the metamorphosis, it is very difficult to separate positive and negative processes. Taking again the EU example I'd say that the mass invasion in it of migrants from the Near East and North Africa had doubled effect. On the one hand, this invasion lessened or at least seriously shaken an over-bureaucratic structure of the EU. On the other hand, it gave the impetus for scholars and scientists to learn to collaborate in such diversified social and cultural context.

IMPEDIMENTS FOR THE MERGING PROCESS

There are very serious impediments to the process of natural and social sciences merging. To my mind, the most serious one is institutionally-fixed walls between social, natural and technical sciences. This separation is now going throughout all social institutions of science and education. For years, the overall system of education has more and more

compartmentalized. But within this process we see a reverse trend of merging two, three and more disciplines. Of course, these multidisciplinary clusters also develop their own protocols as, for example, current medicine. But the main aim here is another: to build into the living organisms without harm to it.

A process of shaping of a layer of scientific bureaucracy is tightly interconnected with abovementioned impediment. This bureaucracy not only parasitizes on the body of the science as social institution but has two other functions. One is the gaining profit form such symbiosis in various forms: additional financial and material resources, public recognition, various modes of representation at national and international bodies, etc. The reverse side of the same coin is the process of slowdown of the pace of scientific research by means of permanent invention of new rules and forms of research activity and its presentation in the standardized forms of presenting of the major research findings (surveys, reports, minutes, press releases, etc.). Theoretically speaking it is the form of super-rationalization or using M. Weber term it is the 'iron cage of bureaucracy' or following M. Burawoy (2008, 2015), a form of excessive codification of the research process.

More than that, by and large 'dramatized' i.e. socially-constructed and short-lived news produced and disseminated by mass-media are gradually forcing out long-term research projects. Breaking news and journalism at large came to the forefront. By this fact the situation is turned upside down. The matter is that globalization means a myriad of simultaneously changing situation in many parts of the world. A time for proper reaction to this process and decision-making is rapidly shrinking. To wait for the results of a long-term research project means a hundred percent loss. The reporters who are working in many 'hot spots' and secret services are becoming the main sources for getting information in time. Of course, necessary information is getting by various technical mean like space monitoring. But the news received from the first hands is appeared more likely and convincing. It is not the end of the story because such first-hand information should be adequately interpreted. And this is a turning point because the processes of it interpretation and accentuation is usually at hands of power elite, political or economic.

Considering the issue at stake in institutional terms, it is the problem of relationships between the science as the international community and the states and supra-national bodies like the United Nations, unions of nation-states or the transnationals. To my mind, the abovementioned the 'iron cage of bureaucracy' is now reproduced on the global scale. The nation-states and international organizations have a lot of filters in order to separate only those ideas, concepts or their personal carriers that are fit to the aims and interests of power elite. It is obvious now that power elites are much more interested in the producing of natural and technical sciences than humanitarian ones. The humanitarians are usually raised inconvenient questions like social injustice and inequality, about global warming and its negative consequences for man and the Biosphere, 'Where is a wasteland ends', etc.

And these global processes lead us to a key question: who is now a generator of main values and goals of a globalized world? It seems to me that we are in-between situation in the moment. On the one hand, it is clear that a global market as itself not already capable to create a united goals which will be accepted by all strata of global population. On the other hand, the science as the social institution has lost its function of producer and disseminator of ultimate goals. Recently such role is played by mass-media that in turn governed by the interests of economic and political oligarchy. The oligarchy has constructed a new realm of social production, namely 'PR research and developments.' And it is not only the new form of social production but a new instrument aimed at shaping of social and political behavior of masses.

After then, let us see on the issue in question from the viewpoint of scientific community. Many social scientists are not prepared to leave their 'ecological niche' within a particular branch of social science or a couple of sciences. A researcher is tightly built in many teams and institutional structures like research programs and projects, international organizations, education institutes, sites, platforms, etc. And researches not only interact with many of them but have short and long-term obligations to them. The researcher has to maintain its professional competence and public image as, say, a leading specialist in urban sociology, social ecology or in any other research field. Therefore, to drop out from a particular 'research niche' is risky from all sides. But the more natural and social sciences are integrated the more such hybrids are needed in experienced specialists capable to combine diverse knowledges and to get a certain integrated result useful both for science and practice.

One should take into account that the more sciences are integrated the higher responsibility of interdisciplinary specialists and their teams. Personal responsibility may be reduced by participation in collective projects (and publications). If such research project gives negative results the project's leader is responsible for it. But it is rather simple scheme. As a rule, any interdisciplinary project is only a small link in a very complicated system: politics—couple of institutions—responsible organization—shaping the aim of research—the research project—resources—major research findings—testing and evaluation them—practical implementation—monitoring the project results. This process is accompanied by periodical intermediate reports, correction of the project aims, use of new methods, etc. If a project leader and its team have saddled a certain realm of research, say, energy metabolism, these people 'appropriates' it pretending to be a national or world leader.

There is a difference between sociologists, on the one hand, and natural and technical scientist, from the other one. The former are usually presenting a state of public opinion in a particular moment of time only whereas the latter are answer for the project outcome with their life. Besides, the political weight of result of particular public opinion survey is much less than the result of a certain technological device which has a great impact not only on public life but on defense potential of a country or on a global safety as well.

Another difference between them is their political potential. Today the humanities have no practical impact on decision-making and shaping of national politics whereas natural and especially technical scientists often convert their scientific status into political or administrative one. This difference is often conditioned by a difference between their life trajectories. While the trajectory of social scientists is usually double-dimensional (research and teaching) the life trajectory of naturalists and engineers is much more long and diverse. But the principle difference between the two is in their relations with industrial production, be it industrial plants, services, information engineering or weapon construction.

Then, the doctors, rescuers, many kinds of engineers as well as the militaries have to know how to act in critical and permanently changing circumstances while the humanitarians do not. For the former the dynamics of an environment and their ability to follow is of a prime importance. Whereas for humanitarians an investigation of various types of values, personalities, mode of living and forms of spatial organization of social life and creation various types of their typology is a basement for their work. Of course, particular cases may be much more complicated but the above types of research and development activity is still valid.

As to sociologists, the part of them is sometimes not fully realized that they are practice integrated approach. It relates first of all to those who make biographical research using especially the oral history method and its variants (Thompson, 1978). Human life is

inseparable and cannot be cut into mono-disciplinary parts. In particular this principled point related to such important realm of studies as a process of permanent socialization. Today one could observe an open contradiction between the continuity of socialization process, on the one hand, and the existing system of secondary and higher education. This institutionally-fixed contradiction cannot be to overcome in one jump. But by means of integrated researches we have to show that this gap should be surmounted. In the age of various metabolic processes and information networking totally embracing human existence it is impossible to analyze any social act without its ties with immediate and global environment. The reverse side of the same coin is the mega-projects like the New Silk Road developed by China and associates. It is both civilizational, territorial and infrastructure enterprise. On the one hand, it is a part of China's idea to build ecological civilization, and it is impossible without deep domestic and international changes. On the other hand, it is a signal of pretention on global domination.

Finally, today interdisciplinary research project run by joint efforts of scientists and scholars from 3-5-10 countries has becoming a norm of the emerging integrated science. This trend is reflected in many international journals both naturalist and humanitarian. As for me, it is not surprising because more than 30 years the 'Cities of Europe...' project had been implemented by the researches from 16 European countries. But current instability in the EU and other parts of the world may prevent to further integrative process. On the other hand, a whole world is quickly becoming unstable and less predictable. Thus, we as community on social, natural and technical sciences should learn to run interdisciplinary projects under these conditions. Let me remind that the western, eastern or Russian scientists or scholars like U. Beck, A. Giddens, I. Wallerstein G. Myrdal, A. Chizhevsky, D. Mendeleev, V. Vernadsky had been interdisciplinary-oriented (look, for example, Chizhevsky, 1964; Myrdal, 1968; Giddens, 2009).

MERGING OF INTEGRATED SCIENCE WITH CIVIL ACTIVISM

This theme deserves a detailed analysis. Therefore, I will to mention here some principled shifts only. First, it is two interrelated processes: the oscillation of scientists and scholars between a research and public activity and the cases when a researcher combines his/her research activity with civil activism, and vice versa. Some students of modern science development suggest that the process of merging these two types of social activity has begun. Second, it is already mentioned use the methods of crowd-sourcing and crowd-funding for gaining necessary information or/and for gaining resources, public weight and recognition. Third, one should keep in mind that not only business and media activity have acquired a global scale but civil organizations as well. Transnational projects such as the Eastern Energy Rink or the New Silk Road developed by a couple of countries gave an impetus for shaping international conglomerates of scientists, scholars and civil activists. There are many other international groups like the Taiga Rescue Network, the Rivers without Borders network system and many others (see, for example, Shvarts and Simonov, 2015; Simonov, 2016). Fourth, it seems to me that the epoch of solidarities including negative ones is coming (Yanitsky, 2004). It is a dialectics of positive and negative solidarities when adversarial parts that compete for resources and political domination are simultaneously forced to unite their efforts in order to protect their common environment in order to survive. Five, a common ground of this form of merging are all-embracing and all-penetrating system of global information-communication network. Finally, I'd like to reiterate that modern well-educated and experienced activists sometimes know much more than participants of research expeditions or those who carried out mass public surveys.

CONCLUSION

Nowadays, we are in the midst of the stormy grows of technological civilization which quickly change our habitual ideas concerning social, cultural and space-time dimensions of global life.

One of the basic ideas of the near past has been the idea that the progress of science is dependent on its further separation into particular disciplines. But the 'compression' of the global community by information-communication networks including between scientists and scholars has sharply changed this worldview. It appears that the progress of any forms of productive and market activity is directly depended on the degree of collaboration of various disciplines including various forms of technological inventions and social constructivism.

The movement towards the merging of social and natural sciences is not linear but irreversible. The more our planet will turn into the global SBT-system the more a necessity for such integration will grow. The process of merging does not exclude a development of mono, bilateral or triple disciplines. Such oscillation is a norm of any research process or construction activity.

From my viewpoint, the forces of mutual attraction or push away may change from time to time but the processes of mutual interpenetration and therefore reciprocal metabolic transformation will continue on global, national and local scale. Would people will or not, the process of natural and social sciences will follow this modern trend. Any attempts to separate an individual or a group from this way may have only temporal character.

The Fourth Industrial Revolution making a human life and its environment more 'compressed' and mobile (not for all!) offered to a man various devices (gadgets, etc.) for coping with this diverse and movable living milieu. By this a society tries to establish a dynamic balance between socially-constructed and movable SBT-systems and temporally-stable local situations and modes of human behavior. At the same time the society violates this balance in the run of struggle for new resources and geopolitical domination. In turn, a competition between balancing and dis-balancing social forces urges integrated sciences to act in two contrary ways: to assist to the processes of gaining new resources and wellbeing and to develop new means for defense from permanent transformations. In other words, the objective processes of sciences merging and a tough market competition clash with each other. The understanding of the relationships between the tempo-rhythms of market fluctuations and the shaping of geopolitical alliances, on the one hand, and the research-and-development processes, on the other, are becoming of a paramount importance. 'Dramatized' i.e. socially-constructed and short-lived news produced and disseminated by media are gradually forcing out long-term research projects. As a result, two adversarial branches of information-communication processes and constructive activity have emerged. The former is aimed at making the world more open for inter-science and human communication while the latter (defensive) is working in opposite direction. This phenomenon confirms the old maxima: all technological innovations are double-sided.

Thus, there are some concluding remarks. First, the integrated community of scientists and scholars should seriously reconsider the very term a 'development' because new technologies inevitably exert influence on all spheres of public life, enhancing ones and slow down others. Second, if our world is tightly integrated and highly mobile a problem-oriented approach has to replace a subject-oriented one. Third, since we live in a hybrid and movable world, a monitoring of its multi-sided transformations have to become one of the main research instruments. Fourth, the relationships between material and virtual reality should be one of the focal point of integrated-science researches. Five, who in this concert of sciences will be responsible for our common future is still an open question.

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