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Instability and Constraint[1]
Interdisciplinary Essay on the Origin of Social Innovations

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ABSTRACT: Within the framework of the present paper we are interested in the circumstances of the origin of social innovations. Presenting and analysing the interdisciplinary literature we may conclude that there really exists a general model in the circumstances of the origin of significant innovations impacting on the whole of some level of hierarchic system. We found that innovations may emerge amid the dissolution, disintegration anarchy, crisis, anomaly, or revolution. In order to remove the political connotations of the above mentioned terms I propose the term instability as a collective for these conditions. It is noteworthy that complex systems may be permanently in state of instability, which may serve as a fundamental source of endogenous creativity in the system.

Introduction

Only the alteration of something leads to change (Hegel 1979). This *alteration* may be the birth of something new or it may be the adoption of an earlier innovation at a specific moment and its diffusion, in this way. Birth or diffusion? Concrete categorization is often merely a question of viewpoint. The present essay postulates that the emergence and diffusion of social innovations are two closely related constituents of social change, often hard to separate even by analysis, which nevertheless must be distinguished conceptually.

The investigation of innovation diffusion as an autonomous research program began with the study of the diffusion of *technological* innovations. The empirical works (Griliches 1988 [1957]), which for a long time determined the direction, nature, and methodology of later research orientation, were published in the fifties and the first comprehensive works of academic standard followed only a decade later (Rogers 1962; Coleman et al. [1966]). After a half-century long accumulation, the study of the diffusion of technological innovations can be said to have come to constitute an autonomous, self-contained, as well as both theoretically and meth-

1 The study is based on research carried out at the Peripato Research Group founded within the framework of OTKA research no. K73033.

odologically fully developed field of research (Geroski 2000).[2]

At the same time, social innovation may obviously be not only a technique embodied in some object, but also any new idea, individual behavior, or collective action. It is noteworthy that the standpoints and technical procedures worked out for dealing with the diffusion of technological innovations were extended, with unusual effectiveness considering the heterogeneity of the new fields involved, to the analysis of the most diverse individual and community learning and modeling processes. As a result, today, concrete investigations of the diffusion processes of social innovations encompass unrelated and very diverse areas ranging from demography to media dynamics (Marchetti 1986, 1997; Marchetti et al. 1996; Modelski–Gardner 2002; Konstandopoulos–Modis 2003).

The present essay intends to focus on the other, much cruder aspect of social change, namely, the origin, rather than diffusion, of innovations. I know of no accepted methodology or theory that may be applied here, and I have none to offer. I merely aim to bring forward a general scheme of the circumstances that make possible the birth of certain – and not just social – innovations. For this reason, although my primary aim concerns the understanding of the origin of *social* innovations in order to convincingly substantiate the existence of such a general model with the necessary number of examples and, perhaps unacquaintedly, harmonizing standpoints taken from the most diverse fields of research, I must, by necessity, take an interdisciplinary approach.[3]

In my opinion, the *"creative anarchy"* metaphor gives a very plastic description of the circumstances enabling the birth of the most diverse social, organizational, scientific, technical, and even biological innovations, while the *instability* and *constraint* metaphor pair offers a rhetorically less impressive, but somewhat more exact picture.

The choice of the essay form is an indication mainly of the fact that in two senses I still cannot tell precisely where the limits of the scope of validity of the foregoing statement lie. I am convinced that the range of effect of the model far exceeds the province of the social sciences, on the one hand, and its validity for every social innovation is far from certain, on the other. I do not have, and, left to myself, perhaps I will never have, a more precise answer to the problem. The perspective of the essay as well as my answers to the countless questions and problems arising in the course of writing it may also be arguable; hopefully, also in the sense that they prove worthy of argument. This is why I have decided to bring the study to the critical attention of the professional public.

2 Researches in economics are particularly advanced. Already in 1930 Simon Kuznets recognized that technological change advances in the form of an S curve, and the Rostowian take-off model also suggests this type of growth pattern. Joseph Schumpeter to date has a following in the field of innovation research. Next to him William Baumol is already regarded a living classic. However, I have deliberately avoided references to the literature on economics that would fill a library. Instead I propose to show that this problem complex – though perhaps with a different perspective and terminology than common to economists – is also present in the literature of broadly understood social science which is not directly concerned with the question of innovations.

3 Naturally, it is by no means self-evident that the examples from different disciplines could not have negligible common characteristics.

Creative tension

In investigating the circumstances of the origin of social innovations, we start out from the microsociological position, according to which, there exists in social reality a special level described as the meeting of the individual and the social. This is the province wherein "social influence reaches and compels the individual to modeling", who in turn, "by following or altering or perhaps rejecting the model, by accepting, modifying or averting the influence, reacts upon the model itself and everyone else party or witness to the event" (Mérei 1996: 10).

I am convinced that ultimately this *tension*[4] – inherent in the meeting of the social and the individual, in the inseparably connected union of modeling and alteration – is the source of all social innovations and, even though unintentionally, makes this microenvironment the primary, permanent source of social innovations.

The overwhelming majority of the innovations arising there are but tiny and, even from the point of view of the direct participants in the event, no more than insignificant adjustments to the world. Other innovations may be more important, but even the most commonplace situations offer numerous examples of how much it depends on the recipient medium[5] whether they will cross the boundaries of the microenvironment at all.

This also means that the delimitation of the origin and diffusion of some innovation is mostly a question of perspective. Viewed from the outside, an innovation crossing the boundaries of a microenvironment appears as newly emerging, but this had to be preceded by diffusion within this environment first. As mentioned above, innovation diffusion is not the subject of the present paper; moreover, I have already discussed the question previously (Fokasz 2006). Therefore, I shall present only a few obvious but all the more descriptive examples to illustrate the relationship between the recipient medium and diffusion.

In the early seventies, I was present when in a number-theory seminar at the Budapest university, ELTE, a first-year mathematics student presented a new and extraordinarily elegant proof of some well-known theorem. A few days later, the professor already included this proof in his lecture, naming the student, of course.

Mihaly Csikszentmihalyi also mentions a case, similar in nature but greater in volume. A few years ago, a PhD student in physics in Munich came forth with a new idea and formula, news of which spread among the physicists at German universities within a week, and aroused the interest of colleagues on the western shores of the US by the end of the second week.

The above examples are noteworthy particularly because Csikszentmihalyi

4 In the wake of Ferenc Mérei, I use the term *tension* in the simplest possible everyday sense. At the same time, one of the main assertions of the essay appears latently here for the first time. Clearly, some kind of a tension – by now as a parameter of the description of the state of a dynamic system – may contribute to the creation of the unstable dynamic state, which the present essay will show to be the precondition for the origin of innovations.

5 Clearly, the nature of the recipient medium fundamentally influences the diffusion of an innovation. It is also well-known that in the case of technological innovations the literature on this subject matter is vast. Its analysis, however, falls outside the scope of this study.

adds that this could never have happened in his own chosen field of psychology. "If a student were to stand up in a psychology seminar in any school in the world and set forth the most profound thoughts ever, it would not cause a stir outside the walls of the classroom" (Csikszentmihalyi 2008: 49).

István Hajnal described Australia's indigenous society as a medium resembling psychology from the point of view of innovation diffusion, where "whatever individual thought arises, whatever individual skill creates, it gets lost, as it were, in the sand drift-like loose and inflexible population organization" (Hajnal 1988: 19). Fernand Braudel gives a similar description of the desert societies of the Sahara that seem from afar as merely a "handful of human dust blowing in the wind" (Braudel 1996: 176). I cannot attest to the objective exactness of these statements, but that is not the issue here. What is of interest is the obvious presence of this perspective in scientific areas far removed from the specialized fields of innovation research.

Thus, it stands to reason that in this special province of the meeting of the particular and the general, where "the general and the particular are present as expectation and emotional tension, as model and impression, as norm and choice, as the imperative and need" (Mérei 1996: 10), not only this "exuberant, bustling chaos" (Koestler 1967: 191) of flashing innovations, but also their dying belong among the most commonplace phenomena of social existence. For instance, historians of economics and science know well that the innovative work focusing on minor details, routinely carried out at technological or scientific workshops hidden from the outside world, is the prerequisite for making a truly new product or scientific discovery.

All this closely resembles the way in which the biological equivalents of creative social acts in evolution, namely, the random changes in the gene struggle for survival. "Atomic changes occur continuously" (Koestler 1967: 191). At the same time, "the overwhelming majority of the ensuing changes are temporary … leave no trace on the operation of the whole" (Koestler 1967: 191). Relatively few mutations, also influencing heredity, reach the higher levels of the hierarchy. "Between the ensuing chemical changes and the appearance of the final result on the stage of evolution … lies the full hierarchy of internal processes, which exercises tight control over the province of possible mutations" (Koestler 1967: 175).

Although all this is more or less self-evident, the practical reason for the special emphasis is that henceforth not all innovations will be of interest to us. Offhand, hoping to be more specific later on, let me just say that within the framework of the present essay we are interested in the circumstances of the origin of innovations which successfully pass the immediate environmental filters and bring about not only significant changes, but even big leaps. If such things exist. This is precisely what we shall try to find out in the following.

Evolutionary big leaps?

The possibility of big leaps in history is well illustrated by Braudel's remark according to which, "the past has been richer in catastrophes and brutal revolutions than in slow evolution" (Braudel 1996: 88). Although, obviously, a statement like this should not be taken literally, it definitely indicates how naturally the possibility of historical big leaps is present in historiography. World War I will serve as a recent example, which "changed everything in the life of Europe: borders, regimes, mental attitudes, and even morals. It threw the most glorious of modern civilizations into such deep disarray that everything changed in its wake" (Furet 2000: 40).

However, "wars, the breakdown of encompassing systems of morality, political revolutions" (Feyerabend 1993: 16) transform not only behavior patterns, but the more important pattern of argumentation as well. No wonder it left its mark on the history of science. It is common knowledge that Thomas Kuhn conceived the development of science through scientific revolutions, so-called paradigm shifts, in the course of which the whole world view of scientific communities undergoes radical change. In the course of these science obviously develops by way of big leaps. In Paul Feyerabend's interpretation: "the history of science will be as complex, chaotic[6], full of mistakes, and entertaining as the ideas it contains, and these ideas in turn will be as complex, chaotic, full of mistakes, and entertaining as are the minds of those who invented them" (Feyerabend 1993: 11).

Although the term *evolution* is mostly used as a synonym for gradual change, it is well-known that "there occur in biological evolution periods of crisis and transition when there is a rapid, almost explosive, branching out in all directions, often resulting in a radical change in the dominant trend of development" (Koestler 1964: 226). Accordingly, evolution based on natural selection also knows the possibility of big leaps, and the "Paleocene growth of the human brain is an excellent example of what we call the evolutionary explosion"[7] (Koestler 1967: 354).

John Maynard Smith and Eörs Szathmáry went even further when, instead of listing the specific big leaps, they distinguished two steps, also distinct in point of principle (Maynard Smith–Szathmáry 1997). In the first case, the information itself – stored in the genes – is modified via almost daily mutations, while in the course of the far less common *major transitions* "the modes of information storage and transmission also change". The emergence of multicellular organisms,

6 I confess, I pounced upon this passage because of the word *chaos*. The situation with this word is the same as it was in the case of *tension*, and will be in the case of *instability*. I use all three words mostly in their everyday sense, but in the theory of dynamic systems they may be attributed strict and mutually related meanings. However, I have been unable to explore within the framework of the present study the consequences of this fact with regard to the circumstances of the origin of social innovations. Therefore, let me just note that though the use of these terms may, for the time being, seem to be mere rhetoric, there is much more to it.

7 "According to the evidence of fossils, the growth of the brain of hominids … started on an unparalleled acceleration course about half a million years ago; the tempo far exceeded the speed of all observable anatomical changes in lower animals." (In: W. E. Le Gros Clark: *The Advancement of Science*. London, 1961, cited by Koestler 2000: 354.)

the appearance of animal colonies, or most recently the developments of human language are examples of major transitions in evolution. What is common to them is that the entities previously capable of autonomous replication thereafter could replicate only as part of some larger entity.[8]

It is noteworthy that according to Szathmáry and Maynard Smith, there is nothing inevitable in the occurrence of these major transitions. Moreover, they are exceedingly rare. The authors believe that in the several billion-year history of life on earth there were only eight instances. At the same time, they play a determinative role in the emergence of the astonishing forms of adaptation of living organisms. In point of fact "the theory of evolution by natural selection does not predict that organisms will get more complex… Empirically, many and perhaps most lineages change little for many millions of years" (Szathmáry–Maynard Smith 1999: 15). Nor did the major transitions take place in order to enable the evolution of complexity. Yet, the ensuing new coding procedures are ultimately responsible for the appearance of increasingly complex organisms and the rise of what biologists reverently term the "wonderfully adapted organisms" (Szathmáry–Maynard Smith 1999: 1).

As I have already mentioned, instead of the thoroughly explored question of the diffusion of innovations, I would like to discuss the much more complex and much less known problem of their origin. However, I cannot, already at the start, specify with a definition-like accuracy those innovations whose origin I would like to explore. As I have indicated, I have no intention of dealing with each of the minute modifications, alterations that keep on bubbling up and almost as frequently bursting in the social microenvironment. I prefer to study those with greater influence, significance, though not necessarily of the magnitude of Maynard Smith's and Szathmáry's major transitions.

First I would like to indicate, rather than define, what I have in mind. These are innovations of the type and nature which lead to new paradigms in science, give rise to new species in biology, and result in new technologies in the economy.[9]

If we wish to be more specific as to the kind of changes, that is, the type of innovations, whose origin we are interested in, then we can build on the fact that most social, biological, physical systems, as well as man-made symbolic systems are comprised of interrelated subsystems. These systems are generally known as complex hierarchic systems (Simon 1982). Below I seek to answer what the preconditions may be for the realization of innovations leading to changes at the

8 Social scientists, too, may find it informative to learn the answer evolutionary biologists offer concerning the question of why the emerging more complex entities are not taken apart by lower-level interests. Its investigation, however, falls outside the scope of the present paper.

9 Let me note that *macro-invention* is a well-known designation in the history of technology. Although the usage is strongly reminiscent of the big leaps I have studied, they are not really the same. Macro-invention designates discoveries where "origin cannot be precisely determined, there is a clear break compared to previous techniques" (Mokyr 2004: 400). The designation refers primarily to antecedents rather than consequences. In this sense the airship is a macro-invention, but the railway, which transformed our world, is not. Compared to these, World War I, the "event colossus" (Nora 1974) of the twentieth century is more likely to hold our attention, because it was not only "bigger than its causes", but may also be considered as the "pristine state of a new epoch" (Furet 2000: 57).

system's level – or involving those touching on any of the subsystems – at the level of the system – or corresponding subsystem – impacted upon by the change itself.[10]

Thus we have come to the central problem of the essay. We have seen above that big, that is, dramatic changes affecting the whole of a system (subsystem) – to keep the somewhat more accurate terminology – do exist. The question is: How are they possible?[11] The fact being that their existence is not so obvious in spite of the reality of the big leaps, since a complex system, a hierarchy with built-in self-control safety mechanisms is quite stabile; it cannot be simply let out here and tightened a little there (Koestler 1967: 178). On the whole, it may be said that in complex systems – due to resistance of other parts of the system – dramatic, sudden changes are unlikely because of the necessity to maintain the compatibility of the constituent parts (Mokyr 1990: 407).

Except in the event that the complex system itself collapses. This happened in the case of the Western Roman Empire, opening the way to the emergence of the western-type of organization of society, one of the truly original innovations in the history of civilization.

On the question of the nature of the West as innovation

I have neither the wish nor the ability to discover even a single new historical fact in a field already subjected to very close scrutiny by historians, economists, and sociologists. Nor do I propose to rearrange known facts. In the following two chapters I shall only endeavor to put in a new light the well-known doctrines of an existing well-known school.

In order to detect the original characteristics of the West as an innovation, we start out from Jenő Szűcs' epochal study (Szűcs 2006). The reason for this is the author's repeated declaration with definitive clarity that "what sharply delimits the medieval West from other civilizations is the development of the autonomous concept of society" (Szűcs 2006: 45); more concretely, "the separation of 'society' and 'state', in point of fact a structural change … or to be more precise, a series of structural changes, in which this duality was present" (Szűcs 2006: 36). Moreover, as Szűcs emphasizes, this "separation is not really an endogenous feature of human history" (Szűcs 2006: 36). Although "every state is built on some society, it is by the gravitation inherent in the high cultures of five thousand years that the emerging state finds its own legitimization 'outside' of society, and consequently develops a device and operational mechanism, in which the society appears as a derivative of the state, and not the other way around. The autonomous existence of any of the sectors of society separate from (and at the same time functionally

10 With this our usage obviously becomes more accurate, compared with the phrase *big leap* used so far. But the change in usage has important consequences. Namely, use of this phrase as well as a part of the cases elaborated in the paper may lead the reader to believe – as I believed when I began to write this – that we are concerned exclusively with the logic of macro-social changes. However, we do not wish to distinguish among the various levels of the hierarchic systems. Consequently, the preconditions of the emergence of innovations inducing changes on *any* level of the hierarchy may claim our interest.

11 The fundamental question in ethics is: Good people exist – how are they possible?

connected to) the state is the rare exception" (Szűcs 2006: 36). Exceptions were such luxury products of history as the Greek polis, the original model of the autonomous society.

In view of the foregoing, Szűcs obviously considered the separation of state and society to be the most original innovation of the western-type of organization of society. Existence of the autonomous society implies a certain limitation of the state, that is, of political power. Two further characteristics of the West, closely related to the separation of state and society, indicate the same limitation, namely the separation of secular and spiritual powers, and of political and civilizational integrations.

The former stems from the period following the fall of the Western Roman Empire, when "during the political chaos and vacuum the Western Church escaped from the subordinate position it naturally occupied in late antiquity … since Constantine (337), and which was subsequently speedily reproduced by the Byzantine Justinianus (532). Separation of the spiritual and the secular, the ideological and the political, spheres is one of the uniquely fertile separations in the West, without which the future 'freedoms', the abstract emancipation of 'society', the nation states to be, the Renaissance, and the Reformation are all inconceivable" (Szűcs 2006: 39–40).

As it is well-known, there never existed a state or imperial formation which would have set the western civilization in a uniform state framework. Charlemagne's empire was perhaps the only western attempt to resolve the synthesis of antique and barbarian elements in the "usual" manner, that is, by correlating the concept of "civilization" with an "imperial", or political, integration. The empire exhausting its last reserves and, with it, this attempt were destroyed by the same element "with which Charlemagne tried to balance the statics shaky from the very first, namely, vassalage. This brought to conclusion the final separation of 'civilization' and 'political framework' in the West" (Szűcs 2006: 40).

Vassalage, appearing for the first time in our analysis, represents the fourth constituent of European society. In itself there is nothing special about the personal dependence characterizing vassalage. "The form is known to every prefeudal society, even the nomads, its network is the binding material of every feudalism. … What first of all distinguished western vassalage from kindred structures was that it almost fully absorbed into the system all social elements left free-floating after the social erosion, on the one hand, and, instead of taking a position beside or below the state, it virtually replaced the state, on the other; consequently, it virtually substituted the 'state' formula with 'social' relations" (Szűcs 2006: 41).

Its "particular 'contractual' character" is another specific feature of western vassalage. This bond is the "relationship of unequals in the name of contractual reciprocity with bilateral obligations: this fundamental endogenous feature of western vassalage was perhaps fictive in given cases, but it was fertile fiction

acting with the force of a value norm" (Szűcs 2006: 41). This led to another important characteristic of the West, to "the human dignity motive preserved even in subordination" (Szűcs 2006: 41).

"Over and beyond this, the territorial consequence of vassalage, the many small provinces governed by their own customaries represented at the given level of intercommunication far more suitable grounds for the development of direct lawfulness and the scrupulous assertion of the law as 'custom', than the roughly articulated from top down, sketchily broad and uniform political-governmental framework" (Szűcs 2006: 42).

In the final analysis we have before us the "the original western model" (Szűcs 2006: 35), the social innovation that István Bibó Hungarian political scientist and sociologist characterized as a structure where "customary, personal, mutually guaranteed obligations and rights, and the small spheres of freedom hold one another in balance" (Szűcs 2006: 35), which "prevent the concentration of power, and represent a force of resistance against the 'brutally expedient' methods of unilateral subordination" (Szűcs 2006: 35).

The question of the origin of the West as innovation

It is obvious from the above that for Szűcs – as well as many others of – the West was a truly important innovation. Therefore, in accordance with the aim of the essay, the circumstances of its origin would claim our interest in any event.

Let us start out with Hajnal's standpoint according to which, "intensive work confined to *narrow, local development* lay the foundations" for European expansion during the age of geographical discoveries, proving the strength of medieval European social development (Hajnal 1988: 7). In the sequence of examples illustrating as well as interpreting this academic observation he notes that "antique and Arabian shipping conquers distance by the multiplication of towing power, that is, by slavery; the mode of European society building does not allow this, so the mariner is left to his own devices" (Hajnal 1988: 7). Thus, *narrow, local development* acts as a constraint for Hajnal, and László Lakatos also emphasized this feature when he said that after the fall of the Roman Empire "life was confined within narrow, local frames, and became paltry, even wretched; small local communities struggled for mere survival" (Lakatos 1998: 59).

Accordingly, the circumstances of the origin of the West may be described as the constraint of circumstances. But these constraints acted under very peculiar circumstances inasmuch as "the dynamics and integration of the West after the turn of the millennium was conditional on the disintegration process of the preceding period, which is the condition for the separation of state and society" (Szűcs 2006: 38). That is to say, the West "started out by *breaking up and crumbling* beyond recognition both state formations in just three centuries (6th–8th centuries). ...

The public authority of the Germans… *dissolved* as did the institutional system of the Empire. … But not only did the 'state' sphere break up, both original 'social' frameworks also became radically *divided*. Germanic population formations *disintegrated*, as did the society, based on law, of the remainder of the Roman populace. With the *expiry* of public authority, political sovereignty itself became illusory, and with the *decomposition* of society, every conventional cohesive force *expired*. For the time being, the private ownership of land as the main crystallizing force also assisted primarily the political-social disintegration" (Szűcs 2006: 39). "Actually, a kind of integration, a fusion of antique and barbarian heritage also took place in the West … but the fusion of the elements was so extensive as to nearly extinguish one another. … Today, an increasing number of details clearly indicate that this *breaking down* of everything is to a considerable degree the condition of the special dynamics which reversed the signs of contrast in relation to Islam and the Byzantine Empire, the two other successors to Rome" (Szűcs 2006: 37).

Broke up, broke down, crumbled, dissolved, divided, expired – even this offhand selection well illustrates how Szűcs' rich rhetoric served to demonstrate what kind of *constraints caused by general state, political, and social disintegration* characterized the circumstances of the origin of the West. The development of vassalage gives a condensed picture, since "instead of some glorious motif, its development was precipitated by wretched *exigency*, where, given the *dissolution* of public authority, protection could only be found in some dependent position under private law, on the one hand, and further power prestige could be acquired, on the other" (Szűcs 2006: 40). In conclusion, according to Szűcs, "the first half-millennium of the West represents a wholly unusual 'take off' in the line of the birth of civilizations: disintegration instead of integration, and what is more, amid definite 'civilizational' decline, re-agrarianization, and prolonged political anarchy" (Szűcs 2006: 37).

As concerns the depth, scale, and duration of disintegration, the circumstances of the birth of the West as innovation must certainly have been unusual. However, the model according to which, the birth of a momentous social innovation is conditional on the breaking up, expiry or dividing of previous organizational forms of society, seems to be a general one. At this point it will perhaps suffice to point out that in Asia as well as in America "great cultures emerged in the narrow sections of the continent … in the narrow areas of the congregation of peoples. Congregations like these *break up* the social organizations founded on natural, day-to-day living, *put an end* to the simple hunter-gatherer way of life, confine small units to an area and *compel* them to set up artificial … permanent organizations" (Hajnal 1988: 21) [italics added, *N. F.*]. In the foregoing Hajnal speaks of concrete cases, yet, discernibly, he sets forth a universal historical developmental model in showing that social organizations confined to an area and land use also came into being amid *constraints caused by disintegration*. Accordingly, the fact that the

circumstances of the emergence of important historical-social innovations may be described basically by some kind of a decay, breaking up, that is, disintegration applies not only to the birth of the West, but may be considered as a general rule.

However, I would go further. In the following I shall use examples from diverse fields to corroborate that the validity of the model points well beyond the perspective of history, and that fundamental change affecting the whole of the operation of a more or less self-regulating system may come about only through the dissolution, breaking up, or, one might say, crisis of the system.

Complex unstable conditions

Let us first take a look at a formation of society which is deeply opposed to change due specifically to its most characteristic features. It is well-known that the most conspicuous features of the model of the bureaucratic organizational system described by Michel Crozier is the system of impersonal regulations covering nearly everything, which "define in detail the various positions and prescribe the mode of behavior that those filling the position must in most cases observe" (Crozier 1981: 286). At the same time, it is clear that in order to "keep relations impersonal, the decisions not falling under the impersonal regulations must unavoidably be made on a level, where those responsible for the decisions are protected from being pressured by those, whom the decisions concern… If the pressure exerted in the direction of impersonality is strong, then the tendency of centralization is unstoppable" (ibid.: 289).

Since in the bureaucratic organizational system "the impersonality of decisions and the centralization of decisions" become "an integral part of the internal balance of the organization" (Crozier 1981: 285), the "only instrument of action … is to frame new regulations, thereby increasing centralization even more" (Crozier 1981: 294). However, the "organizational system, which is characterized mainly by rigidity, naturally, cannot easily adjust to change and tries to resist every transformation" (Crozier 1981: 296). For this reason, a "bureaucratic organization is an organization that cannot correct its behavior by learning from its errors, and in which dysfunctions constitute the decisive elements of balance" (Crozier 1981: 296).

Actually, "no organization can avoid the necessary transformation; it is constantly compelled to adjust to changes in its environment, as well as to the less conspicuous, though just as profound, changes in its members" (Crozier 1981: 283). Consequently, "resistance to change in a bureaucratic organization is only one aspect of the problem" (Crozier 1981: 297). Sooner or later even the most rigid organization is compelled to change, giving rise to another, perhaps a still more important, aspect, "the special mode of adjustment of a bureaucratic organization" (Crozier 1981: 297).

The logic of Crozier's model implies that "in a bureaucratic organization change must follow a top-down course, must be universal, extending to the whole organization. This change cannot be gradual, occurring by stages and in parts. It is a prerequisite of change that the dysfunction of the organization be severe enough to threaten its survival" (Crozier 1981: 298), in short, that the system undergo *crisis*. Crisis is the only "way whereby the necessary corrections can be carried out, therefore, it also plays an important role in the development of the system – which is possible only through crisis" (Crozier 1981: 298).

In a bureaucratic organization change can take place only through crisis permeating the whole organization. Is this example too extreme? Have we chosen an excessively rigid case of social organization, so the mode of its change cannot be typical? I rather think that in our case this really extreme example serves to emphasize rather than distort. It makes obvious what is also valid but less readily perceived in other areas, for instance, in science.

The complex relationship between change and rigidity, novelty and orthodoxy in science is well-known. I have nothing new to add, but I would like to refer to this fact, too, with the help of some select tendentious quotations. For instance, Isaiah Berlin described cultural history as a "changing system of ideals that first liberate, but later inevitably become a straitjacket" (Berlin 1999: 159). Arthur Koestler gives a similar view of the uncertainties of science "between relatively brief eruptions which lead to the conquest of new frontiers, and long periods of consolidation. …The new territory opened up by the impetuous advance of a few geniuses acting as a spearhead … and soon the revolution turn into a new orthodoxy, with its unavoidable symptoms of one-sidedness overspecialization, loss of contact with other provinces on knowledge, and ultimately, estrangement from reality" (Koestler 1964: 225).

Kuhn's theory is more systematic and comprehensive than Koestler's, yet he says something similar. According to his standpoint, if Koestler's new orthodoxy, or scientific paradigm in Kuhn's terminology, comes into being, then the "normal science does not aim at novelties of fact or theory" (Kuhn 1970: 52). So, the question concerns how such changes may nevertheless come about and how can new "theories … arise from normal science" (Kuhn 1970: 66). According to Kuhn, "one can appropriately describe the fields affected – by the change NF – as in state of growing crisis" (Kuhn 1970: 67). Just as the "Aristotelian fortress collapsed" or, as John Donne lamented, "tis all pieces, all coherence gone" (Koestler 1964: 229) in the early 17th century, thus numerous other examples verify that a "novel theory emerged only after a pronounced failure in the normal problem-solving activity" (Kuhn 1970: 74). The emergence of new theories is preceded by strong professional uncertainty, an overgrowth of the variants of a previously dominant theory and according to Kuhn "that proliferation of versions of a theory is a very usual symptom of crisis" (Kuhn 1970: 70), and "by proliferating versions of the

paradigm, crisis loosens the rules of normal puzzle-solving in ways that ultimately permit a new paradigm to emerge" (Kuhn 1970: 80).

Since "there are certain analogies between the characteristic stages in the history of an individual discovery, and the historical development of a branch of science as a whole" (Koestler 1964: 224), the above findings may be carried over to the field of individual discovery with relative ease. Clearly, "when life presents us with a problem it will be attacked in accordance with the code of rules which enables us to deal with similar problems in the past" (Koestler 1964: 118). "But novelty can be carries out to a point – by life or in the laboratory – where the situation still resembles *in some respects* other situations encountered in the past, yet contains new features or complexities which make it impossible to solve the problem by the same rules of the game which were applied to those past situations" (Koestler 1964: 119). This is why Feyerabend could say that "the success of 'science' cannot be used as an argument for treating as yet unsolved problems in standardized way" (Feyerabend 1993: 2).

The unsolvability of some problem produces a block in the individual's thinking. It is quite possible that in the resulting stress situation "when al hopeful attempts at solving the problem by traditional methods have been exhausted … organized purposeful behavior itself seems to go to pieces" (Koestler 1964: 119). Koestler has "coined the term 'bisociation' in order to make distinction between the routine skills of thinking on a single 'plane' as it where, and the creative act, which … always operates on more than one plane. The former may be called single-minded, the latter a double-minded, transitory state of unstable equilibrium where the balance of both emotion and thought is disturbed" (Koestler 1964: 35).

Although Koestler enriched our vocabulary with a new term when describing the creative activity of the mind[12] as an unstable state, he actually depicted the same situation as the above citations. Thus the road to the firm 'a-ha' experience manifested in the moment of insight of scientists also follows the hitherto distinguished model of the birth of innovations.

The above examples from diverse fields of learning use different words – *disintegration* or *anarchy* in the case of the birth of the West, *crisis* in the course of the change of the bureaucratic organization, *anomaly*, *crisis*, *revolution* in the case of new scientific theories, and *bisociation* in that of individual discovery – but they mean the same. Accordingly, an innovation may come into being only amid some

12 Bisociation describes the state of the creative mind; therefore, at this point the question arises whether special personality traits distinguish people successful in problem-solving from others. According to Csikszentmihalyi, most personality traits attributed to creative people show strong dependence on culture. Nevertheless, if he had to say in one word what makes creative people different from others, Csikszentmihalyi would use the attributive *complexity*, because creative people often "fuse thoughts and behavior in themselves that are separate in others" (Csikszentmihalyi 2008: 66). It is interesting that in connection with creative activity Koestler too speaks of a transitory, that is complex unstable state, moreover, Feyerabend also uses similar term in framing the requirements of scientific method, underlining that "a complex medium, which is surprising and holds in store unforeseeable developments, requires complex methods" (Feyerabend 2002: 39). I do not think this identical usage is accidental. It may be that in a seemingly insoluble blocked situation a complex personality, imbued with extremes and subjected to the pressure of this internal tension, would more readily surrender the rules preset on the basis of previous experience, are customary but useless in the given situation, and in this respect may become a part of the complex methods leading to the solution. All this raises the possibility of connecting our study to the nowadays revived research program on complex systems, however, we are yet unprepared.

kind of a disintegration, anarchy, crisis, or revolution[13]. The question remains: How does this dissolution of many names come about?

From blind-alley development to creative anarchy

The answer is simple if – in the spirit of the principle, when "the senators sit there without legislating… Once the barbarians are here, they'll do the legislating" (Cavafis 1992) – we attribute dissolution to the impact of an external force. As an endogenous process, however, the answer depends basically on its antecedent, that is, what we have gotten into immediately before the onset of disintegration. Mostly a blind alley, it seems. This holds for normal science which "repeatedly goes astray" (Kuhn 1970: 6), and explains why "the great breakthroughs in science, the arts, or philosophy are all successful escapes from some impasse" (Koestler 1967: 231). It also holds for biology, where – although the complex adaptation forms of living organisms fill us all with wonder – "the theory of evolution by natural selection does not predict that organism will get more complex. … many and perhaps most lineages change little for many millions of years" (Szathmáry–Maynard Smith 1999: 15), and in this respect it has come to its end. We find a similar blind-alley quality in the field of social development, concerning which – beside Bibó's often cited metaphor **–** we again refer to Hajnal. He said that the "possibilities and methods of human communication trigger the creative forces, and the organizations, institutions thus established shape the community and the individual; as soon as the social organization becomes mechanized … as soon as it surmounts the society instead of actively mediating, encouraging man's material-mental activity, its prolific capacity for development ceases: it can no longer induce people to produce something new. It may become an increasingly sophisticated culture but without the renewed advance, elaboration of ancient deep forces" (Hajnal 1988: 18). In such a society "people live in what is already given" (Hajnal 1988: 18).

In other words, sooner of later development inevitably maneuvers itself into some blind alley,[14] and the only way out is to go backward. It already means a regression when during the crises "scientists usually develop many speculative and unarticulated theories" (Kuhn 1970: 61), and it is well-known that "Copernicus did not continue where Ptolemy left off; he went back two thousand years, to Aristarchus" of Samos (Koestler 1967: 233). Kuhn called scientific revolutions "those non-cumulative developmental episodes in which an older paradigm is replaced in whole or in part by an incompatible new one" (Kuhn 1970: 128). Clearly, giving up the idea of the cumulative development of science and the

13 „As a rule, then, the beginning is made by some great trauma… This followed by a traumatic neurosis, which really constitutes the incubator of the new being. By it everything is thrown about and broken down into a labile, anarchic, chaotic condition" (Friedell 1953: 54).

14 In the longer run every course is a blind alley. All this raises the possibility that the real problem in Hungarian history is not its blind-alley character, but that in the sequence of fresh starts the road ends too soon.

incomparability of the rival paradigms endow scientific revolutions with the same legislative beginnings accompanied by the violation of the law as hold for political revolutions today. As a matter of fact, originally, the word revolution was an astronomic term, which referred to the regular rotating movement of celestial bodies. It is particularly noteworthy that in the seventeenth century, when we first encounter the word as a political term, it was still used to describe the *return* to some predetermined point (Arendt 1963).

Stops, blind alleys in social development also "mean disintegration, the increasing shallowness of the driving forces, the absence of the need for productive effort" (Hajnal 1988: 18). Only "societies building on new, perhaps *more primitive*, but different, more viable fundaments" (Hajnal 1988: 18) can offer a way out, societies, which are able to "reach down [*step back?* my interjection, *N. F.*] into the deep, irrational world of man's and the society's life, seizing therefrom the new life material, as it were, for elaboration" (Hajnal 1988: 25) [italics added, *N. F.*].

It is commonplace that "creativity in the sciences and the arts often depends on seeing analogies" (Szathmáry–Maynard Smith 1999: 145), since "the creative act … does not create something out of nothing, it … combines, synthesizes" (Koestler 1964: 140). Moreover, "it was the evolution of language that broke down the barriers … and made possible the continuous cultural evolution that followed" (Szathmáry–Maynard Smith 1999: 145). At the same time, it is well-known that in the course of individual discoveries we have to abandon (*stepping back?*) just this language in order to make our new ideas clear (Koestler 1967: 235).

In other words, we may end up in a blind alley by way of the one-way process of – scientific, biological, social – overspecialization. Backing out of it is accompanied by the undoing of specialization, that is, in this sense, by disintegration. Backing out may be not only concrete but also figurative. Koestler cites a notion from 1928 "according to which … vertebrates… descend from the *larvae* of a primitive echinodermatous form reminiscent of sea urchins or sea cucumbers" (Koestler 1967: 213) [italics added, *N. F.*]. This may be a fine example for the developmental model "of getting out of the blind alley by backing out firmly and jumping high," which, according to Koestler, "can be identified at every important and definitive evolutionary juncture" (Koestler 1967: 216).

The development of the eukaryotic cells offers an especially exciting example, which is considered a major evolutionary leap even by those who do not necessarily share Szathmáry's and Maynard Smith's concept of big leaps in evolution. These cells are real factories with specialized organelles. Their nuclei are separated from the surrounding cytoplasm, they have a number of cell organelles – such as the mitochondrion considered the cell's energy factory – and pigmented plastids. They are much more complex than the prokaryotic cells (essentially bacteria) and, on the average, about ten times bigger. But the most important difference between prokaryotic and eukaryotic cells is that the former are surrounded by a rigid cell

wall. We do not know how it happened, but we may assume that losing the cell wall triggered the series of changes leading to the development of the eukaryotic cells. Undoubtedly, this in itself created a very *unstable* situation for the cells. In the absence of walls the cells became highly vulnerable, which led to the extinction of the lines of descent in question, one after the other. Therefore, the loss of the rigid cell wall is, in itself, a risky backward step, and, presumably, occurred repeatedly. Then, at some stage, this more unstable situation made possible the development of a new nutritional method, and "*forced* the ancestral eukaryotes to evolve a new way of segregating of their chromosomes" [italics added, *N. F.*]. The resulting "mitosis can be seen as *something forces* on the eukaryotes because the old, prokaryotic mechanism was no longer effective" (Szathmáry–Maynard Smith 1999: 68) [italics added, *N. F.*]. On the other hand, it is a fact that this new method was the prerequisite to the appearance of multicellular organisms, so we need not dwell on the evolutionary significance of this step.

It seems that there really exists a general model in the circumstances of the origin of significant innovations impacting on the whole of some level of a hierarchic system. The innovation may emerge amid the *dissolution*, *disintegration*, *anarchy*, *crisis*, *anomaly*, *revolution*, or *bisociation* resulting from the backing out of some blind alley. Henceforth *instability* will be used as a collective for these conditions. This will not only simplify our phraseology, but also remove the direct or indirect political connotations of the terms conventionally used in social scientific sources, making it clear that we treat these terms as dynamic categories for describing the circumstances of the origin of innovations and not as political categories.

At the same time, I prefer to use the attribute *unstable* as a metaphor, to exploiting its exact dynamic meaning. This is not to say that there is no connection at all with this specialized scientific meaning. The connection with the modern chaos theory is particularly exciting, since in the course of the so-called chaotic behavior the system approaches always new unstable conditions, "chaos is, therefore, permanent instability" (Tél–Gruiz 2002: 80). It is also noteworthy that complex systems may be permanently in a state of nonequilibrium (instability), which may serve as a fundamental source of endogenous creativity in the system. Furthermore, the fact that unstable chaotic systems are extremely sensitive to external influences is decisive in making virtually impossible the prognostication of the long-term consequences of highly significant innovations. All this leads one to look on all kinds of social engineering with very strong reservations. However, thinking through how the above natural scientific findings apply to social systems requires further research.

We may establish that big, that is, dramatic changes affecting the whole of one system (subsystem) are possible if the said system (subsystem) becomes unstable; with this we come to our proposed resolution of the essay's central problem. Since we have answered the initial question, our study ends at this point.

Nevertheless, I feel the need to continue, because I would like to make it absolutely clear that in the foregoing we have explored only the *necessary* conditions of the origin of innovations affecting a whole system. The kind of constructivist activism characterized by "the worse, the better," or "let's foment a revolution, provoke turmoil, bring about a state of disorder" in the interest of some hoped for utopia does not in any way follow from our findings. The fact is that instability by no means guarantees the emergence of innovations, and I am inclined to believe it is impossible to explore the sufficient conditions even theoretically. In any case, at this point I have certainly come to the limits of my knowledge. Of course, not knowing something does not mean we cannot give account of the nature of this not knowing, which is what I shall try to do in the remaining part of the essay.

In both Hajnal's and Bibó's perception of the peculiarities of European social development special emphasis is attached to their use of the phrase *a state of 'creative anarchy'* (Lakatos 1998: 59) to characterize the circumstances after the fall of the Roman Empire, which they – and, as we have seen, Szűcs too – regarded as extraordinary. Koestler used the very same phrase when he said that any new scientific synthesis surfaces from "creative anarchy" (Koestler 1964: 230) which recurs from time to time in the history of every discipline and which corresponds to the "incubation" period seen in the case of individual discoveries. When, in connection with scientific development, Kuhn discusses the "destructive-constructive paradigm changes" (Kuhn 1984: 97), then, though in different words, he not only qualifies very similarly the circumstances of the birth of something new, but also calls to mind the well-known concept of *creative destruction* (Schumpeter 1976). We know Schumpeter used the phrase in order to grasp the endogenous process of economic development, wherein the enterprises, regarded as the incessant source of innovations, create something new by destroying old structures – in the field of consumer goods, production and transport methods, markets, or organizations.

Moreover, this may explain how during the past couple of hundred years western capitalism was able to introduce important technological, technical, organizational, and social innovations without cataclysms. In my opinion, the concept of *creative destruction* is but the economic equivalent of the microanalytical perspective cited from Mérei in the early part of the study. This is a likely interpretation in light of the fact that Schumpeter regarded as entrepreneurs not only the independent businesspersons of the market economy, but every economic subject assigned the function of achieving new combinations (Schumpeter 1968: 120). Furthermore, competition among entrepreneurs acts as the economic counterpart of *tension* in the inseparably connected modeling and alteration process, which makes it a permanent source of economic innovations. Accordingly, the peculiarity of the western-type of market capitalism lies in the frequency with which innovations

emerging in a micro-level state of instability become macro-level results, rather than in their birth under not unstable circumstances.[15]

Naturally, none of the above mentioned authors averred that anarchy itself is fertile and destruction is inevitably creative, since they all qualified the given unstable situation as creative in retrospection, aware of the outcome. (Lakatos 1998: 59) If it is not always so, we justifiably ask: how can anarchy, destruction, instability actually be creative in a given case?

Is evolution the token of success?

First of all, let us make it clear that, contrary to our usage so far, innovations are by no means one-time acts, as priority disputes often accompanying scientific discoveries indicate, among others. These disputes conceal not only the existing personal aspirations and career ambitions of scientists, but also the real difficulties in deciding priority. This is very vividly described in Kuhn's analysis of the priority dispute surrounding the discovery of oxygen. As he noted, "Priestley's claim to the discovery of oxygen is based upon his priority in isolating – in 1774 – a gas that was later recognized as distinct species" (Kuhn 1970: 54). On the other hand, Antoine Lavoisier was the first to reach the conclusion in 1777 that "the gas was a distinct species, one of the two main constituents of the atmosphere, a conclusion that Priestley was never able to accept" (Kuhn 1970: 54). Evidently, "though undoubtedly correct, the sentence *'oxygen was discovered'* misleads by suggesting that discovering something is a single simple act" (Kuhn 1970: 55). "Discovering a new sort of phenomenon is necessarily a complex event, one which involves the recognizing both that something is and what it is" (Kuhn 1970: 55). Undoubtedly, Priestley chanced upon oxygen, but did not really understand its nature, therefore, "we can safety say that oxygen had not been discovered before 1774, and we would also say that it had been discovered by 1777 or shortly thereafter" (Kuhn 1970: 55).

The process of individual discoveries is just as complex with multiple steps as that of the discoveries of the various disciplines. As for how many iterative steps it goes through, how many loops it contains, how many insights it requires depends on the depth and range of the subject. Incubation lasts sometimes years and sometimes only a couple of hours (Csikszentmihalyi 2008: 88). Or much less, we might add, considering that some of the great orators did not know what they were going to say when they opened their mouths to speak (Feyerabend 1993: 51).

So far we have referred to the development of eukaryotic cells as taking place in one big step, while clearly this evolutionary step comprised a whole se-

15 I do not have the answer as to the how of it, but I believe its explanation would require a much more thorough study of the literature on economics, we have deliberately avoided here. It is also clear that the subject matter dealt with here is one of the reasons why the sphere of validity of the model I have discussed remains uncertain. In the course of writing the essay I have repeatedly stressed my special interest in significant innovations, but what qualifies as significant in a hierarchical system strongly depends on one's point of view. It may easily be that an innovation proves important on the level of some subsystem, but from the point of view of higher organizational levels it may be unnoticeable even.

ries of events. This included the development of a new nutritional method, the emergence of an internal cellular structure and a new method of locomotion, the development of chromosomes with several replication points, and the appearance of organelles. "The fascinating thing about this story is the way in which many apparently unconnected changes, setting the scene for all subsequent evolution, were in a sense forced on the cell by the loss of the cell wall, an event that might have seemed at the time both trivial and regressive" (Szathmáry–Maynard Smith 1999: 78).

Thus we can see that innovations are not one-time acts but complex events, that is, multiple-step, feedback processes. This in turn, specifically in connection with this process character, makes it possible for us to take the success of some novelty, initiative, or innovation to mean the prevalence over the unknown future. That is to say, if we were to imagine an artificial life form, which has the greatest chances of survival in a complex and unfathomable environment, then it would not be an engineering, constructional problem as commonly understood. (Csikszentmihalyi 2008: 116). Nor can we propose some ready-made solution, instead we may only conceive that course which stands the greatest chance – still far from certainty – of leading to some kind of a, by necessity, temporary solution.

What we can build on is that the conceived life form must be capable of *"tackling most unexpected situations"* and also of *"taking advantage of as many opportunities as possible"*. On the one hand, in accordance with this dual expectation, it is obviously advantageous for the entities of the life form to strive for some measure of stability, and, with a certain degree of conservative attitude based on the principle of *"if it isn't broken, don't glue it together"* (Mokyr 2004: 211) and relying on past experiences, to try to find the best possible solution to everything, because it is "routine that keeps us prepared for the next challenge".[16] On the other hand, it would be expedient for "one or another of the entities to have a regulatory system which gives a positive signal every time they discover something". It is particularly important that the discovery be valuable in itself and the "organism receive reinforcement not only for useful discoveries, otherwise it would be overpowered in the struggle with the future" (Csikszentmihalyi 2008: 116). In order to find a solution which is in some way successful, we must lay down certain rules and leave the rest to time, more exactly, to the Blind Watchmaker, the Darwinian evolution. However, this does not mean that in the foregoing we have offered logical arguments in favor of the application of the Darwinian evolutionary view. We have merely unfolded what our chosen definition of success implicitly contained already. If survival is success, then Darwinian evolution is the "answer".

It is noteworthy that in European social theory there is a trend of thought which preceded Darwin, indeed exerted an influence on him through Malthus, and which works with a development concept much like Darwin's. This "shows

16 The captain of the world's biggest container carrier said this on the National Geographic Channel.

how complex, orderly and, in a precisely defined sense, suitable institutions may develop through interpersonal relations, which owe little to planning, which we do not make up, but derive from the autonomous actions of many people, who were acting unawares" (Hayek 1960: 58–59). Since the development of this social order would be "the result of adaptive evolution" (Orthmayr 2002: 90), we must consider whether the elementary conditions of the unfolding of evolution based on natural selection could be realized on the social level.

Speaking about conditions, the first thing usually emphasized is that the process of evolution based on natural selection requires the periodic appearance of mutations, that is, new inheritable variations, in the course of procreation. Therefore, heredity cannot be perfect, because its occasional errors (mutations) create the diversity wherein selection may take effect. Let us note, however, that initially, at the beginning of life on earth "the problem would have been too much mutation, and not too little" (Szathmáry–Maynard Smith 1999: 34). If there are too many mutations, then selection cannot sustain the original message for the necessary length of time. Clearly, in the course of Darwinian evolution prevailing in the organization of society the problem arises more from the inaccuracy than from the high accuracy of replication.

At this point the case of the emergence of the West as innovation becomes particularly interesting. Let me say in advance that I do not propose to give an exhaustive description of the development of the western-type of societies in the following discussion. Let us consider it as a highly stylized case study, in which, still within the conceptual framework of the school of the dawn of social history, I shall analyze the applicability of Darwinian evolution to this concrete case.

In Lakatos' opinion, expressed in his study reconstructing Hajnal's developmental theory, "the most important thing in the whole of European development – what really makes it 'European' and 'humane' – is that due to the peculiar – otherwise intimidating, but from the point of view of subsequent development actually advantageous – circumstances at the beginning of the development, over a long historical period the social actors, even the smallest, had the opportunity to shape the life forms and techniques as best suited them, and not the powers that be, not money, not rational thinking could (greatly) interfere" (Lakatos 1998: 60).

I tend to interpret all this as the change in the modes of storage of information found in human communities, which recalls the circumstances of Szathmáry's and Maynard Smith's evolutionary big leaps. The conditions of the Darwinian evolutionary process, however, are created by the self-governing character of the world of customs. Lakatos summarizes it as follows: "(1) Initially strong intellectualism did not yet exist, therefore, life forms were expressed in customs; (2) the social actors themselves expressed their living conditions in customs; (3) customs protect against external forces…; (4) … this complexity of the world of

customs offers protection against the commanding reason" (Lakatos 1998: 60).

Consequently, through the transmission of life forms developed by exploratory human endeavors, customariness ensured the necessary accuracy of replication, and made it possible for evolution based on natural selection to function on the level of the smallest social actors as well. I think Lakatos formulated essentially the same idea when, summarizing Hajnal's thoughts on ideal social development, he underlined the role of time next to the constraint of individual achievement and the unconditional recognition of spontaneous life forms. Thus, the secret of the success of medieval European development lies in the unfolding of evolution at this lowest autonomous social level.

The above paragraph introduced the *ideal* social development beside the *successful* one from the point of view of survival, whereby we have also entered the realm of value judgments. Obviously, in judging the success of innovations we may also consider, beside survival, a great variety of moral, religious, political, economic or short-term efficiency criteria. Their application will not make evolution teleological, but by way of certain – mostly "we don't do such things" type of prohibitive – (moral, religious, political, economic etc.) rules we may nevertheless set the general course for social development.

It is in terms of this value content that Lakatos queries: "is Hajnal right in suggesting that the best results are accomplished when things are entrusted to the people? Is it true that left to themselves people will create a world worthy of man?" (Lakatos 1998: 63). Well, "evolution by natural selection lacks foresight" (Szathmáry–Maynard Smith 1999: 25), consequently, it fails to guarantee anything. At most we can say is that "amid the disintegration … civilizational decline, re-agrarianization, and protracted political anarchy" (Szűcs 2006: 37) characterizing the first half-millennium of the West, certain previous constraints ceased. When, "after the near complete breakdown of the old forms, this peculiar, mosaic-like, ceremonious, mannered feudal world … after its own fashion, set out to establish some new kind of a relationship between society and state…, the administrative, military, fiscal, jurisdictional functions of the state *sinking* stepwise, as it were, *dispersed* in the "feudal society", "sovereignty was absorbed *piecemeal*, as it were, by a newly formed political sector of society" (Szűcs 2006: 42) (italics added, N. F.).

The secret of European development lay not simply in the evolutionary process, but also in the noteworthy fact that basically the struggle for survival was no longer between empires, states, city states or dynasties. Selection shifted to the level of "many small provinces each governed by its own customary law" (Szűcs 2006: 42), more specifically, to the level of (micro-)communities functioning under the constraint of individual performance. For this reason, if this evolution was able to "invent" anything – for which there were, of course, no prior guarantees at all – it could only be autonomous society itself.

Thus the "exploratory endeavors" (Orthmayr 2002: 90) of human micro-

communities gave rise to "something greater than the individual human spirit" (ibid). Consequently, "every idea, plan rests on enormous, tested empirical material. The organization of European society … transmitted knowledge, from manual labor to abstract thoughts, on a never before seen scale. All work and enterprises are deeply embedded in the labor structure of society, they become real, possessing a sense of assurance based on the experience of generations, they do not rely merely on theoretical learning and individual abilities, daring" (Hajnal 1988: 7).

It seems that in the course of the emergence of the western-type of organization of society the "means whereby information is stored and transmitted (Szathmáry–Maynard Smith 2000: 15) in human communities have also changed. This is why I consider this innovation within the framework of social evolution to be a major evolutionary step as Szathmáry and Maynard Smith understood it.

Concluding remarks

Our initial motivation was to explore the circumstances of the origin of innovations leading to big leaps. Then we narrowed this, saying, we were interested in the possibility of dramatic changes affecting the whole of some organizational level of a hierarchic system. On the basis of the direction our modified phrasing has taken and the terminology – tension, instability, complex hierarchic systems, chaos – gradually introduced along the way, our analysis has taken on the aspect of a systems-theory approach. In view of this, the absence of systems-theory references may be surprising. The reason is precisely that I consider this connection to be of fundamental importance. Therefore, a systems-theory analysis of the questions discussed here merit a separate study. By citing sources far removed from systems-theory approaches, the aim of the present essay was merely to demonstrate the presence of this view in such works as well. I plan to write a sequel based on the theory of dynamic systems, in which I would like to pair Niklas Luhmann's biology-inspired systems theory with the chemoton theory devised by Tibor Gánti, the leading Hungarian representative of systems chemistry.

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