WHAT ARE THE CHARACTERISTICS OF REVOLUTION AND EVOLUTION?

Coccia Mario*

CNR -- NATIONAL RESEARCH COUNCIL OF ITALY
Collegio Carlo Alberto, Via Real Collegio, n. 30, 10024-Moncalieri (Torino), Italy
E-mail: mario.coccia@cnr.it

Mario Coccia: http://orcid.org/0000-0003-1957-6731

Abstract. This conceptual paper describes some characteristics of revolution and evolution. Revolution here is an historical process that generates a rapid and structural change in society. Instead, evolution is a progressive growth and change, generating a transition from simple to complex systems. Overall, then, this study suggests that revolution and evolution are a result of human activity in society originated to satisfy specific needs and/or to cope with and adapt in the presence of environmental threats and changing contexts.

Keywords. Radical Change, Rebellion, Coup d’état, Insurrection, Struggle, Internal Wars, Growth, Social Progress, Advancement, Development.

JEL Codes: B15, B52, D74, N00, H56.

Suggested Citation
Coccia, Mario, 3315985 (January 15, 2019). Journal of Economic and Social Thought, vol. 5, n. 4, pp. 288-294, http://dx.doi.org/10.1453/jest.v5i4.1789. Available at SSRN: https://ssrn.com/abstract=3315985

Electronic copy available at: https://ssrn.com/abstract=3315985
1. The concept of revolution

Revolution is one of the most important events in the history of human society (Amman, 1962; Pettee, 1938). Revolution can be defined as: “change, effected by the use of violence, in government, and/or regime, and/or society. By society is meant the consciousness and the mechanics of communal solidarity, which may be tribal, peasant, kinship, national, and so on; by regime is meant the constitutional structure—democracy, oligarchy, monarchy; and by government is meant specific political and administrative institutions” (Stone, 1966, p. 159). This definition allows to distinguish between the seizure of power that leads to a major restructuring of government or society and the replacement of the former elite by a new one, and the coup d’état involving no more than a change of ruling personnel by violence or threat of violence. In the 1960s, social scientists at Princeton University have changed the word "revolution" with the concept of "internal war": any attempt to alter state policy, rulers, or institutions by the use of violence in society, where violent competition is not the norm and where well-defined institutional patterns exist (Paret, 1961, cf., Rosenau, 1964). In philosophy, Hegel suggests that revolution is equated with irresistible change represented by a manifestation of the world spirit in an unceasing quest for its own fulfillment (Benhabib and Marcuse, 1987). Marx (1976, 1978, 1981) argues that revolution is a struggle between the bourgeoisie and the proletariat. Arendt (1958, 1963) interprets the revolutionary experience as a kind of restoration, whereby insurgents attempt to restore liberties and privileges, which were lost as the result of government’s temporary lapse into despotism. Instead, de Tocqueville (1955, p. 8) has defined revolution as an overthrow of the legally constituted elite, which initiated a period of intense social, political, and economic change.

The main characteristics of revolution according to Deutsch (1964, pp. 102-104) are:

a) degree of mass participation

b) duration

c) number of persons killed both during and after the revolution (a measure of intensity)
d) intentions of the insurgents

A prime factor of revolution is the emergence of an obsessive revolutionary mentality. In the behaviorist approach, the causes of alienation of revolutionaries and of the weakness of incumbent elite are economic factors. Parsons (1951) treats disaffection or "alienation" as a generalized phenomenon that may manifest itself in crime, alcoholism, drug addiction, daytime fantasies, religious enthusiasm, or serious political agitation (cf., Coccia, 2014, 2014d). Marx (1976, 1978, 1981) states that popular revolution is a product of increasing misery, whereas de Tocqueville (1955) claims that revolution is a product of increasing prosperity. Olson (1963) and Lewis (1963) argue that revolutionaries are the product of rapid economic growth, which creates both *nouveaux riches* and *nouveaux pauvres*. The initial growth phase may cause a decline in the standard of living of the majority of people because of enormous forced savings for reinvestment. Revolution can increase the gap between expectations (social and political for the new rich, economic for the new poor) and the realities of everyday life (cf., Gottschalk, 1944). In short, revolution creates new expectations by economic improvement, followed by economic recession and governmental reaction, which widen the gap between expectations and reality (Davies, 1962).

Davies (1962) argues that the fundamental impetus toward a revolutionary situation is generated by rapid economic growth associated with a rising of the standard of living and a long-term phase of growth followed by a short-term phase of economic stagnation. In this context, Coccia (2018) seems to reveal a sequential historical process that runs from wars between great powers occurring in phases of instability of long waves (peak and/or trough) to clusters of innovation (in the trough of long waves), which trigger the upward phase of new long waves1.

Revolution can generate a variety of typologies in different societies. Brinton (1938, pp. 3-4) suggests a differentiation between coup d’état that is a simple replacement of one elite by another, and major revolutions that are associated with social, political, and economic change. Huntington

---

1 cf., Coccia, 2005a, 2015b, 2016, 2017b, 2018e, 2018f
(1962, pp. 23-24) presents a further refinement in the classification of revolution using four categories: the internal war, the revolutionary coup, the reform coup, and the palace revolution. Finally, Chalmers (1964) categorizes revolution in six typologies as follows:

1. the Jacquerie is a spontaneous mass peasant rising.
2. the Millenarian Rebellion is similar to the first but with the added feature of a utopian dream, inspired by a living messiah.
3. the Anarchistic Rebellion is the nostalgic reaction to progressive change.
4. the Jacobin Communist Revolution is: “a sweeping fundamental change in political organization, social structure, economic property control and the predominant myth of a social order, thus indicating a major break in the continuity of development” (Sigmund Neumann as quoted in Chalmers, 1964).
5. the Conspiratorial coup d’état is the planned work of a tiny elite fired by an oligarchic ideology.
6. the Militarized Mass Insurrection is a phenomenon of the twentieth century based on a deliberately planned mass revolutionary war guided by dedicated elite.

Coccia (2018c, 2018d) argues that terrorism (a distinct form of political violence with some characteristics similar to revolution) thrives in specific regions with high growth rates of population that may generate income inequality and relative deprivation of people. Overall, then, revolutions are a systematic process due to manifold economic, social, psychological, anthropological, and perhaps biological factors. Of course, these factors can change over time and space in society.

2. The concept of evolution

The concept ‘evolution’ is associated with a specific directional activity. The word ‘evolution’ was first applied to natural phenomena by the German biologist Albrecht von Haller in 1744 (cf., Richards, 1992). Darwin (1859) preferred phrases like ‘descent with modification’ and only once wrote ‘evolved’. Spencer (1957) did much more than Darwin (1859, 1871) to popularize the term ‘evolution’ that can be associated with different types of phenomena, including all feasible
manifestations of development and change (Hodgson and Knudsen, 2006). In general, under some conditions, evolution must involve Darwin’s principles of variation, inheritance and selection (Hodgson and Knudsen, 2006). Bagehot (1872), Ritchie (1896) and Veblen (1899) argued that the principle of selection could explain survival and evolution not only of individuals, but also of groups, customs, nations, business firms and social institutions. The principle of selection provides the means for explaining adaptedness, survival and evolution in society. In the evolution of complex systems, some scholars point out self-organization or spontaneous order as an alternative concept to Darwinian selection (Ashby, 1947; Von Foerster, 1960). Others scientists consider social evolution as a Lamarckism process rather than Darwinian one. In fact, the Lamarckian inheritance of acquired characters may occur in social evolution. These mechanisms of change supporting evolution are often very different, within and between systems in nature and society (Hodgson and Knudsen, 2006). Socioeconomic evolution is due to successful rules, habits or behavior spread by imitation and learning. Socioeconomic evolution is also based on characteristics acquired or learned by individuals that are more adapted to their environment.

Individuals and human society sometimes give up resources to benefit their neighbors, to the extent that this helping lowers the entity's reproductive fitness (Wenseleers et al., 2010; Wenseleers, 2006). These altruistic traits pose a difficulty for Darwin's theory of natural selection, which emphasizes the spread of individually advantageous traits (Darwin 1859; Pennisi, 2005). This altruism, generating cooperation between potentially competing individuals, and as a consequence co-evolution, abounds in natural and social systems (Gintis et al., 2005). Szathmáry (2011) argues that the benefits of cooperation can drive the social evolution because it must pay off, even if it is immediately costly to cooperators (cf., Bourke, 2011; Queller, 1997; Maynard Smith and Szathmáry, 1995).

The concept of evolution in society is associated with the idea of human progress. Spencer (1902, p. 253) suggests that social evolution is: “the full happiness of each, and therefore to the greatest happiness of all”. In particular, the idea of evolution in society is based on: “progressive satisfaction
of human wants in all their ramifications and complexities. It is this inner kernel of human 
satisfactions which gives character to the whole account of social evolution; which is interpreted, 
not in terms of mechanism, … but of purpose” (Woods, 1907, p. 816). The fundamental elements of 
social evolution are health, wealth, sociability, knowledge, beauty, etc. (cf., Small, 1905, p. 682). 
These elements support the acquisition by humanity of better and more complex forms of life. 
Social evolution is associated with new technologies that yield greater satisfaction of human wants 
(cf., Coccia, 2010, 2014, 2015). Moreover, evolution is achieved in appropriate structures with 
strong democracy, good governance, higher education, and higher innovative outputs (Coccia, 
2010, 2014, 2018). In fact, Woods (1907, p. 817) points out that: “Progress in an individual or in a 
community is thus a function of all the various qualities and aspects of life which are there realized. 
Not physical well-being alone, nor the abundance of wealth, nor even the moral advance which has 
been attained, may serve as the measure of progress; all of the interests are required because all are 
phases of normal human life.” Hence, the determinants of socioeconomic evolution and, as a 
consequence, of human progress are human wants and human control of nature through science 
advances and new technology (cf., Woods, 1907).  

Finally, evolution can be categorized in two types:

- **growth** is a proportionate change in a system

- **development** denotes a disproportionate change in the size of a sub-system as a consequence of 
  change in the overall size of a system (economic, biologic, social, etc.).

---

2 Cf. also studies by Coccia, 2005, 2009, 2010, 2010a, 2010b, 2010c, 2011, 2012, 2014, 2014a, 2014b, 2014c, 2014d, 
2015, 2015a, 2017, 2017a, 2018, 2018a, 2018b; Coccia and Benati, 2018; Coccia and Bellitto, 2018; Coccia and 
Cadario, 2014; Coccia and Rolfo, 2010; Coccia et al., 2015.
Conclusion

Krader (1976, pp. 109-110) argues that: “The concept of advancing society through the combined agencies of evolution and revolution was at one time related in a single overarching theory. The opposition of evolution and revolution, on the contrary, stands to us not as a dialectical relation whose contradictions are to be resolved, but as an unresolved tension….The theory underlying social evolution is doubly linked to biology”. Overall, then, evolution and revolution are a cyclical process in human society affected by manifold factors that can change over time and space (Figure 1). A comprehensive analysis of these phenomena in nature and society, affected by economic, social, psychological, anthropological, and biological factors of the entities under study, is a non-trivial exercise. To conclude, revolutions and evolutions are a result of human activity in society to satisfy specific needs to cope with and/or adapt in the presence of environmental threats and changing contexts.
References

Amman P. 1962. Revolution: A Redefinition, Political Science Quarterly, vol. 77, n.1, pp. 36-53.
Arendt H. 1958. The Origins of Totalitarianism. Meridian, Cleveland.
Arendt H. 1963. On Revolution. Viking, New York.
Ashby W. R. 1947. Principles of the Self-Organizing Dynamic System. The Journal of General Psychology, 37 (2): 125–28. doi:10.1080/00221309.1947.9918144. PMID 20270223.
Bagehot, W., 1872. Physics and Politics, or Thoughts on the Application of the Principles of ‘Natural Selection’ and ‘Inheritance’ to Political Society. Henry King, London.
Benhabib S., Marcuse H. 1987. Hegel's Ontology and the Theory of Historicity. MIT Press, Cambridge, Massachusetts.
Bourke A. F.G. 2011. Principles of Social Evolution, Oxford University Press, Oxford.
Brinton C. 1938. The Anatomy of Revolution. Vintage, New York.
Chalmers J. 1964. Revolution and the Social System, Hoover Institution Studies, Stanford.
Coccia M. 2005. A Scientometric model for the assessment of scientific research performance within public institutes”, Scientometrics, vol. 65, n. 3, pp. 307-321. DOI: 10.1007/s11192-005-0276-1
Coccia M. 2005a. Metrics to measure the technology transfer absorption: analysis of the relationship between institutes and adopters in northern Italy, International Journal of Technology Transfer and Commercialization, vol. 4, n. 4, pp. 462-486. https://doi.org/10.1504/IJTTC.2005.006699
Coccia M. 2009. What is the optimal rate of R&D investment to maximize productivity growth?, Technological Forecasting & Social Change, vol. 76, n. 3, pp. 433-446. https://doi.org/10.1016/j.techfore.2008.02.008
Coccia M. 2010. Democratization is the driving force for technological and economic change, Technological Forecasting & Social Change, vol. 77, n. 2, pp. 248-264. https://doi.org/10.1016/j.techfore.2009.06.007.
Coccia M. 2010a. The asymmetric path of economic long waves, Technological Forecasting & Social Change, vol. 77, n. 5, pp. 730-738. https://doi.org/10.1016/j.techfore.2010.02.003
Coccia M. 2010b. Spatial patterns of technology transfer and measurement of its friction in the geo-economic space, International Journal of Technology Transfer and Commercialisation, vol. 9, n. 3, pp. 255-267. https://doi.org/10.1504/IJTTC.2010.030214
Coccia M. 2010c. Public and private investment in R&D: complementary effects and interaction with productivity growth, European Review of Industrial Economics and Policy, vol. 1, ISSN: 2109-9480
Coccia M. 2011. The interaction between public and private R&D expenditure and national productivity, Prometheus-Critical Studies in Innovation, vol.29, n.2, pp.121-130. DOI: 10.1080/08109028.2011.601079
Coccia M. 2014 Religious culture, democratisation and patterns of technological innovation, International Journal of sustainable society, vol. 6, n.4, pp. 397-418, DOI: http://dx.doi.org/10.1504/IJSSOC.2014.066771.
Coccia M. 2014a. Structure and organisational behaviour of public research institutions under unstable growth of human resources, Int. J. Services Technology and Management, vol. 20, nos. 4/5/6, pp. 251–266, DOI: 10.1504/IJSTM.2014.068857

Coccia M. 2014b. Driving forces of technological change: The relation between population growth and technological innovation—Analysis of the optimal interaction across countries, Technological Forecasting & Social Change, vol. 82, n. 2, pp. 52-65, DOI: 10.1016/j.techfore.2013.06.001

Coccia M. 2014c. Emerging technological trajectories of tissue engineering and the critical directions in cartilage regenerative medicine, Int. J. Healthcare Technology and Management, vol. 14, n. 3, pp. 194-208, DOI: http://dx.doi.org/10.1504/IJHTM.2014.064247

Coccia M. 2014d. Socio-cultural origins of the patterns of technological innovation: What is the likely interaction among religious culture, religious plurality and innovation? Towards a theory of socio-cultural drivers of the patterns of technological innovation, Technology in Society, vol. 36, n. 1, pp. 13-25. DOI: 10.1016/j.techsoc.2013.11.002

Coccia M. 2015. The Nexus between technological performances of countries and incidence of cancers in society, Technology in Society, vol. 42, August, pp. 61-70. DOI: http://doi.org/10.1016/j.techsoc.2015.02.003

Coccia M. 2015a. Patterns of innovative outputs across climate zones: the geography of innovation, Prometheus. Critical Studies in Innovation, vol. 33, n. 2, pp. 165-186. DOI: 10.1080/08109028.2015.1095979

Coccia M. 2015b. Technological paradigms and trajectories as determinants of the R&D corporate change in drug discovery industry, Int. J. Knowledge and Learning, vol. 10, n. 1, pp. 29–43. DOI: http://dx.doi.org/10.1504/IJKL.2015.071052

Coccia M. 2016. Problem-driven innovations in drug discovery: co-evolution of the patterns of radical innovation with the evolution of problems, Health Policy and Technology, vol. 5, n. 2, pp. 143-155. DOI: 10.1016/j.hlpt.2016.02.003

Coccia M. 2017. Sources of technological innovation: Radical and incremental innovation problem-driven to support competitive advantage of firms. Technology Analysis & Strategic Management, vol. 29, n. 9, pp. 1048-1061, DOI: 10.1080/09537325.2016.1268682

Coccia M. 2017a. The source and nature of general purpose technologies for supporting next K-waves: Global leadership and the case study of the U.S. Navy's Mobile User Objective System, Technological Forecasting & Social Change, vol. 116 (March), pp. 331-339, DOI: 10.1016/j.techfore.2016.05.019

Coccia M. 2017b. Asymmetric paths of public debts and of general government deficits across countries within and outside the European monetary unification and economic policy of debt dissolution, The Journal of Economic Asymmetries, vol. 15, June, pp. 17-31, DOI: 10.1016/j.jeca.2016.10.003

Coccia M. 2018. A Theory of the General Causes of Long Waves: War, General Purpose Technologies, and Economic Change. Technological Forecasting & Social Change, vol. 128, March, pp. 287-295 (S0040-1625(16)30652-7), https://doi.org/10.1016/j.techfore.2017.11.013

Coccia M. 2018a. An introduction to the methods of inquiry in social sciences, Journal of Social and Administrative Sciences, vol. 5, n. 2, pp. 116-126, DOI: http://dx.doi.org/10.1453/jsas.v5i2.1651.

Coccia M. 2018b. Classification of innovation considering technological interaction, Journal of Economics Bibliography, vol. 5, n. 2, pp. 76-93, DOI: http://dx.doi.org/10.1453/jeb.v5i2.1650
Coccia M. 2018c. Classification of innovation considering technological interaction, Journal of Economics Bibliography, vol. 5, n. 2, pp. 76-93, DOI: http://dx.doi.org/10.1453/jeb.v5i2.1650

Coccia M. 2018d. Terrorism Driven by High Population Growth. Contemporary Voices: St Andrews Journal of International Relations. 1 (1), pp. 1–13. (https://cvir.st-andrews.ac.uk/131/volume1/issue1/) Available at SSRN: https://ssrn.com/abstract=3175185

Coccia M. 2018e. A Theory of classification and evolution of technologies within a Generalized Darwinism, Technology Analysis & Strategic Management, DOI: 10.1080/09537325.2018.1523385. http://dx.doi.org/10.1080/09537325.2018.1523385 Journal ISSN: 1465-3990

Coccia M. 2018f. Optimization in R&D intensity and tax on corporate profits for supporting labor productivity of nations, The Journal of Technology Transfer, 43(3), 792-814, DOI: 10.1007/s10961-017-9572-1, https://doi.org/10.1007/s10961-017-9572-1

Coccia M., Bellitto M. 2018. Human progress and its socioeconomic effects in society, Journal of Economic and Social Thought, vol. 5, n. 2, pp. 160-178, DOI: http://dx.doi.org/10.1453/jest.v5i2.1649.

Coccia M., Benati I. 2018. Rewards in public administration: A proposed classification, Journal of Social and Administrative Sciences, vol. 5, n. 2, pp. 68-80, DOI: http://dx.doi.org/10.1453/jsas.v5i2.1648.

Coccia M., Cadario E. 2014. Organisational (un)learning of public research labs in turbulent context, International Journal of Innovation and Learning, vol. 15, n. 2, pp.115-129, DOI: 10.1504/IJIL.2014.059756.

Coccia M., Falavigna G., Manello A. 2015. The impact of hybrid public and market-oriented financing mechanisms on scientific portfolio and performances of public research labs: a scientometric analysis, Scientometrics, vol. 102, n. 1, pp. 151-168, DOI: 10.1007/s11192-014-1427-z

Coccia M., Rolfo S. 2010. New entrepreneurial behaviour of public research organizations: opportunities and threats of technological services supply, International Journal of Services Technology and Management, vol. 13, n. 1/2, pp. 134-151. DOI: 10.1504/IJSTM.2010.029674

Darwin, C.R., 1859. On the Origin of Species by Means of Natural Selection or the Preservation of Favoured Races in the Struggle for Life. Murray, London.

Darwin, C.R., 1871. The Descent of Man, and Selection in Relation to Sex, 2 vols. Murray and Hill, London/New York.

Davies J. C. 1962. Toward a Theory of Revolution, The American Sociological Review, vol. 27, n. 1, pp. 5-13.

De Tocqueville A. 1955. The Old Regime and the French Revolution. Doubleday, New York.

Deutsch K. W. 1964. External Involvement in Internal Wars. In H. Eckstein (ed.), Internal War: problems and approaches, Free Press of Glencoe, NY, pp. 100-110.

Gintis H., Bowles S., Boyd R. T., Feh, E. 2005. Moral Sentiments and Material Interests: the Foundations of Cooperation in Economic Life. Cambridge, MA: MIT Press.

Gottschalk L. 1944. Causes of Revolution, American Journal of Sociology, vol. 50, no. 1, pp. 1-8.

Hodgson G. M., Knudsen T., 2006. Why we need a generalized Darwinism, and why generalized Darwinism is not enough. Journal of Economic Behavior and Organization 61(1), pp. 1-19.

Huntington S. 1962. Patterns of Violence in World Politics. In S. Huntington (ed.), Changing Patterns of Military Politics. Free Press, New York, pp. 17-50.
Krader L. 1976. Social evolution and social revolution, Dialectical Anthropology, Vol. 1, No. 2, pp. 109-120.

Lewis W. A. 1963. Commonwealth Address, in Conference Across a Continent (Toronto), pp. 46-49.

Marx K. 1976 (1867). Capital, vol. 1. Vintage, New York.

Marx K. 1978 (1865–70). Capital, vol. 2. Vintage, New York.

Marx K. 1981 (1863–65). Capital, vol. 3. Vintage, New York.

Maynard Smith J., Szathmáry E. 1995. The Major Transitions in Evolution. Oxford University Press, Oxford.

Olson M. 1963. Rapid Growth as a Destabilizing Force, Journal of Economic History, vol. 23, (December), pp. 529-532.

Paret P. 1961. Internal War and Pacification: The Vendée, 1793-96, Princeton University, Princeton, NJ.

Parsons T. 1951. The Social System, Free Press of Glencoe, NY.

Pennisi, E. 2005. How did cooperative behavior evolve? Science, 309, 93.

Pettee G. S. 1938. The Process of Revolution, Harper & Bros. Pierson. New York.

Queller, D. 1997. Cooperators since life began. Quarterly Review of Biology 72: 184-188.

Richards, R.J., 1992. The Meaning of Evolution: The Morphological Construction and Ideological Reconstruction of Darwin’s Theory. University of Chicago Press, Chicago.

Ritchie, D.G., 1896. Social evolution. International Journal of Ethics 6, 165–181.

Rosenau J. N. 1964. Internal War as an International Event. In J. N. Rosenau (ed.), International Aspects of Civil Strife. Princeton University Press, Princeton, NJ, pp. 45-91.

Small A. W. 1905. General Sociology, University of Chicago, Chicago.

Spencer H. 1857. Progress: it’s law and cause, Westminster Review, vol. 67, April, pp. 445-465.

Spencer H. 1902. Social statics, abridged and revised; together with the man versus the state, Williams and Norgate, Oxford.

Stone L. 1966. Theories of Revolution, World Politics, vol. 18, n. 2, pp. 159-176.

Szathmáry, E. 2011. Evolution: To group or not to group. Science, vol. 334, pp. 1648-1649.

Veblen, T.B., 1899. The Theory of the Leisure Class: An Economic Study in the Evolution of Institutions. Macmillan, New York.

Von Foerster H. 1960. On self-organizing systems and their environments, pp. 31–50 in Self-organizing systems. M.C. Yovits and S. Cameron (eds.), Pergamon Press, London.

Wenseleers T., Gardner A., Foster K. R. 2010. Social Behaviour: Genes, Ecology and Evolution, ed. Tamas Szekely, Allen J. Moore and Jan Komdeur. Published by Cambridge University Press.

Wenseleers, T. 2006. Modelling social evolution: the relative merits and limitations of a Hamilton's rule-based approach. Journal of Evolutionary Biology, 19, 1419-1422.

Woods E. B. 1907. Progress as a Sociological Concept. American Journal of Sociology, vol. 12, n. 6, pp. 779-821. Stable URL: http://www.jstor.org/stable/2762650