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How Does Innovation Sustain 'Sustainable Innovation'?

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Over the last sixty years or so, *innovation* has become a central cultural value of our society. Innovation is in every discourse: in the media, in policy and in theories. More recently, *sustainable innovation* gained increased attention among scholars, and among many others. We suggest that it is impossible to study the concept of sustainable innovation without going back to the concept of innovation. Sustainable innovation is just one ramification among many of a centuries-old concept: innovation.

This chapter examines the history of the concept of innovation in order to unearth the characteristics of the concept, then questions the contemporary concept of sustainable innovation. Based on historical evidence, the first section suggests that the concept of innovation is a sustainable concept (a long-lasting concept, a concept that maintains itself, that perpetuates over time) in three senses. First, the concept of innovation has the capacity to travel among social spheres, which makes it a trans-discursive term that everyone understands spontaneously. Second, the concept is polysemic and has the capacity to change meaning according to the user and to the context of use. Third, the concept is programmatic. It has an evaluative and normative dimension, even a dogmatic one.

The second section studies the diverse meanings of the concept of sustainable innovation as found in the management literature in order to determine the uses made of the concept, the discourses in which it is embedded, and the functions it serves. Like innovation, sustainable innovation is a sustainable concept: it travels easily among scholars and between scholars and officials; it changes meaning according to use; and it is eminently performative. In addition, sustainable innovation has the characteristic of elasticity, which reinforces its status as a sustainable concept.

Why is Innovation (as a Concept) so Sustainable?

A Concept that Travels

The concept of innovation has the capacity to travel between social spheres (like academia and policy), within a social sphere or discipline, and among institutions. It is a trans-discursive term that serves mobilization. A trans-discursive term is a term that is used in a diversity of discourses because it synthesizes, simplifies and organizes a reality, and provides actors with a sense of orientation (Miettinen, 2002). It serves a diversity of actors who aim to create communities and nations of innovation. On the theoretical side, innovation is a bridging concept. The concept of innovation serves as a tool to bring different disciplines together for the construction of a trans-discursive object. Because of this multi-functional purpose, the concept has shifted constantly over the centuries between the political, the polemical, the instrumental and, lately, the theoretical (Godin, 2015a).

Innovation, a concept of Greek origin (*kainotomia*), entered the Latin vocabulary around the third to fourth century (as *innovo*). The entry of the concept into our everyday vocabulary was initially due to religion. A context of order and orthodoxy explains the situation. The concept was used to suppress dissent. From the very beginning of the Reformation, royal and ecclesiastical authorities used "innovation" in their discourse. In 1548, Edward VI, King of England and successor to Henry VIII, issued a *Proclamation Against Those That Doeth Innouate*. [1] The proclamation places innovation in context, constitutes an admonition not to innovate, and imposes punishments on offenders (England and Wales. Sovereign. Edward VI, 1548). This was only the beginning. In the following two centuries, Church authorities embraced the same representation of innovation. The Church produced lists of forbidden innovations, required bishops to visit parishes to enforce the ban, required bishops and archbishops as well as doctors (university professors) and schoolmasters to take an oath against innovations, and ordered trials to prosecute the "innovators". Weekly sermons spoke against innovation, as a form of heresy.

Then the concept diffused into other social spheres. The meaning of innovation enlarged, firstly into the political sphere. Advice books and treatises for princes and courtiers supported the pejorative understanding of innovation, and included instructions not to innovate. The monarchists of the seventeenth and eighteenth centuries accused Republicans of being "innovators". No Republican – no citizen in fact, even the most famous Protestant reformer, English Leveler or French revolutionary – thought of applying the concept to his own project. Innovation was too dreadful word for that. In contrast, and precisely because the word had a moral connotation, monarchists used and abused the word, labeling Republicans as innovators. This linguistic practice continued until the French Revolution – and beyond – and casted a general disrepute on the idea of innovation.

Secondly, innovation widened its meaning to the social sphere. Books of manners urged people not to meddle with innovation. The social reformer or socialist of the nineteenth century was called a "social innovator". His aim is to overthrow the social order, namely private property. Innovation is a *scheme* or *design* in a pejorative sense – just as innovation is considered conspiracy in political literature (the words used are *project*, *plan*, *plot* and *machination*).

Everyone shared this representation of innovation. Natural philosophers, from Francis Bacon onward, never named as innovation what was certainly the most innovative project in science: the experimental method (Godin, 2016a). Equally, very few artisans and inventors talked of their inventions in terms of innovation (Godin, 2016b). And there was no theory of innovation. The concept did not travel into science and technology, not yet.

A Polysemic Concept

The concept of innovation is polysemic, having the capacity to change meaning according to the user and to the context of use. Throughout history, the concept of innovation has been mainly a negative concept. It was used as a linguistic weapon and a derogatory label against every proponent of change: the heretic, the revolutionary, the social reformer. The concept gradually began to shift to the positive in the nineteenth century (see for example the

[1] During the reign of Edward VI (1547-1553) the realm was governed by a Regency Council because he died before reaching his majority.

philosopher Jeremy Bentham, 1824; encyclopaedists like Touchard-Lafosse and Roberge, 1822-24, and Delepierre, 1836; the American socialist John Patterson, 1850). A new context explains the situation. Change is everywhere, or so it is said (in science, politics and industry), and change is now valued and promoted in the name of liberty, progress and happiness. Innovation is a means to political, social and material *progress*. Writers narrate or rather rewrite the story of the past in terms of innovation, including the Reformation and the French Revolution, and talk of innovators in positive terms. Innovation is a source of national pride too. As Alexis de Tocqueville, French philosopher and writer on the democracy in America, put it:

> L'Américain pris au hasard doit donc être un homme ardent dans ses désirs, entreprenant, aventureux, surtout novateur. Cet esprit se retrouve, en effet, dans toutes ses œuvres ; il l'introduit dans ses lois politiques, dans ses doctrines religieuses, dans ses théories d'économie sociale, dans son industrie privée ; il le porte partout avec lui, au fond des bois comme au sein des villes [The American must be fervent in his desires, enterprising, adventurous, and above all, innovative. This spirit can be found in everything he does: he introduces it into his political laws, his religious doctrines, his theories of social economy, and his private industry; it remains with him wherever he goes; deep in the middle of the woods or in the heart of cities] (Tocqueville, 1835: 201).

Over the next century, a totally new representation of innovation developed:

- Innovation is no longer seen as subversive to the social order, but simply as opposed to traditional ways of doing things.
- The innovator is not a heretic. He is simply different from the masses or from his fellows. He may be a deviant, but in a sociological sense: an original, a marginal, a nonconformist, an unorthodox.
- The innovator is ingenious and creative. He is an experimenter, an entrepreneur, a leader; he is the agent of change.

From a category of social life, innovation in the twentieth century turned into a practical category or action category (firms' strategies, public policies) and a category of knowledge (analytical). The concept reached the economic sphere, where it was discussed in terms of the technological. This remains the dominant representation of innovation today.

Technological innovation is a major cause of the conceptual shift in the concept of innovation. Technological innovation (as either the application of science to industry or as commercialized invention) is a term that emerged after World War II, with only a few exceptions before that date (Veblen, 1915: 118, 128-29; Kuznets, 1929: 540; Hansen, 1932: 25, 27-31; Stern, 1937; Schumpeter, 1939: 289). Within only a few decades, technological innovation became the hegemonic representation of innovation, thanks to or because of a market ideology (Godin, Forthcoming). The vocabulary used is quite large: innovation *tout court* (with an implicit technological connotation), technological change, product/process innovation, industrial innovation.

Those who contested innovation in the past – governments – started de-contesting innovation, and produced reflective thoughts on innovation as a policy tool. One after another, international organizations and governments embraced technological innovation as a solution to economic productivity and international competitiveness and then launched innovation policies. Scholars began theorizing about innovation, produced models of innovation by the dozens to 'enlighten' firms on business strategies for growth, and policy-makers on policies

for national progress. The century-old subjectivity of the concept reached the theoretical level. Innovation came to be defined in new terms, as an inclusive concept, inclusive of a large class of people and activities – in contrast to research as the province of scientists alone. Innovation is not a single act, that of one individual or a class of individuals, but a social or *whole* process, whose purpose is putting inventions on the market (commercialization of inventions). As engineer and manager Jack Morton at Bell Laboratories stated in 1971 in *Organizing for Innovation* (Morton, 1971: 3):

> Innovation is not just one single act. It is not just a new understanding or the discovery of a new phenomenon, not just a flash of creative invention, not just the development of a new product or manufacturing process; nor is it simply the creation of new capital and consumer markets. Rather, innovation involves related creative activity in *all* [Morton's italics] these areas. It is a connected process in which many and sufficient creative acts, from research through service, couple together in an integrated way for a common goal.

At the same time, the theorists of innovation began to contest what comprises the concept. Are innovation and change synonymous, as the precursor terms for talking of innovation, cultural change, social change and technological change, suggested? Is innovation the generation of new inventions or the use of them, or both? Is innovation a world's-first invention (an invention being commercialized for the first time) or does it include also the adoption of an existing invention by a specific user or adopter (imitation thus being innovation)? Scholars vary in their answers to these questions according to their discipline. Economists tend to prefer the idea of a brand-new product while sociologists and management include adoption of invention.

A Programmatic Concept

Today the concept of innovation takes various specific forms, many of them as a contestation of the technological view: social innovation, common innovation, responsible innovation, inclusive innovation, etc. Yet many of these new forms have the same function as technological innovation. Whatever its specification, the concept of innovation is prescriptive or programmatic. To paraphrase Roger Chartier on representations and discourse: the concept furnishes actors with a justification and a reason to innovate by stating and programming what such actors should do (Chartier, 1988: 10). The concept of innovation has an evaluative and normative dimension, even a dogmatic one. As Morton put it: "Innovation is certainly a "buzz-word" today. Everyone likes the idea; everyone is trying to "innovate"; and everyone wants to do better at it tomorrow" (Morton, 1971:73).

Scholars and theorists of innovation are no exception. They carry what sociologist Everett Rogers called a "pro-innovation bias": "Researchers have implicitly assumed that to adopt innovations is desirable behavior [rational] and to reject innovations is less desirable [irrational]" (Rogers, 1962: 142). Innovation is good, always good. Failures, imitation and negative effects of innovation, to take just some examples of non-innovation or NOvation as some call it, are minimized and rarely form part of theories of innovation (Godin and Vinck, 2017).

Policy explains a lot here. As Rogers put it, the innovation bias is "due to the tendency for researchers to look at the process from the source's viewpoint, rather than from the receiver's. This taking of the source's viewpoint in turn may stem from the sponsorship of

most diffusion research by sources of innovations (that is, change agencies)" (Rogers and Agarwala-Rogers, 1976: 176, footnote 11). Rogers is right. From the very beginning, "innovation studies" has been a policy-oriented field (Godin, 2012a; 2014).

From the 1960s onward, innovation turned to a panacea for every socioeconomic problem of society. There is no need to inquire into the problems or needs of society. Innovation is the *a priori* solution. *Need* (often called demand), a major concept of innovation in the 1960s, has almost disappeared today. Supply (of innovations) is the main focus of studies. Even when need has first place, as in a few theories like studies of social innovation, innovation is always the ultimate solution. Innovation has an autonomous status.

After the 1960s, scholars from every discipline embraced the concept of innovation. Innovation is so large a concept that it serves multiple purposes. Organizational innovation, educational innovation and political innovation are just some of the specifications that the concept took on. This vocabulary has exploded in the last few decades, for example: open innovation, frugal innovation, grassroots innovation, eco-innovation, sustainable innovation.

Sustainable Innovation

The fact that the concept of innovation travels easily, that it is polysemic and programmatic, makes innovation a durable or sustainable concept. In the second part of this chapter, we look at the term sustainable innovation. Over the last decade, the term has become part of our vocabulary and has succeeded in becoming a widespread notion. Only the future will tell whether sustainable innovation is a durable term or an innovation fad (Gaglio, 2017). In this part, we stress the genesis of the term, its meanings and its main features in the light of those of "innovation", as discussed in the first section of the paper.

A Polysemic Concept

The academic literature on sustainable innovation, especially that in management, is mainly distributed over the decades of the 2000s and 2010s. Certain articles are more central than others, partly because they are cited more often or propose an up-to-date state of the art. This indicates that sustainable innovation is a genuine field of research with its own issues.

The concept of sustainable innovation is anchored within the challenges of sustainable development. The term sustainable development is older by about fifteen years, coming from the Bruntland report (1987) and its three pillars (environmental, social and economic). How can we explain this roughly fifteen-year gap? In fact, sustainability and innovation do not mix well at first sight: innovation generally refers to GDP growth and the mainstream economy (Godin, 2014), not the alternative economy, despite, for example, the recent rise of the (not so new) notion of social innovation (Pol & Ville, 2009; Godin, 2015b). Sustainable innovation cannot be studied without going back to sustainable development as a collective aim. To be more specific, sustainable development is becoming central in political discourses, becoming a part of the landscape, along with corporate social responsibility, for example. Yet the movement is far from an accomplished reality: global warming is accelerating, and climate disasters, which reinforce social inequalities, have never been so numerous since the beginning of the Anthropocene. If sustainable societies do not exist, they must be created, and sustainable innovation is one way to achieve that:

> "In the past decade, research on sustainable innovations has expanded rapidly to increase our understanding of the ways in which new technologies and social practices enable societies to become more sustainable" (Boons & Lüdeke-Freund, 2013, p. 9).

Insofar as societies must become more sustainable, according to the literature, products, goods or behaviors needed to follow the same path on a global basis. This defines the spectrum of sustainable innovation:

> "Sustainable innovation or eco-innovation has been broadly defined as the process of developing new ideas, behaviour, products and processes that contribute to a reduction in environmental burdens or to ecologically specified sustainability targets" (Hellstrom, 2007, p. 148).

As a consequence, sustainable innovation is defined as "innovations that have a superior ecological performance" (Boons & Lüdeke-Freund, 2013, p. 11). [2] This is the environmental sense of sustainable innovation. Undoubtedly, this sense is the most prevalent, and sustainability collapses into environmental development. The two other pillars of sustainable development (social and economic) are less discussed, and the three are not integrated into an overarching approach. Conceptually, sustainable innovation underlines the subjective ambivalence that underlies innovation, namely its good and bad effects. This dialectic was picked up recently (Kimimaa and Kern, 2016) in the name of "policy mixes for sustainability transition" (Rogge and Kern, 2016; Rogge, this volume). The idea is to mix different policy instruments "involving both policies aiming for the 'creation' of new and for 'destabilising' the old" (Rogge and Kern, 2016, p. 205).

Two different points of view exist toward sustainable innovation, and this will lead us to the second meaning of sustainable innovation. On the one hand, Nidumolu, Pralahad & Rangaswani (2009), in an article published in the *Harvard Business Review*, argue that "There is no alternative to sustainable innovation". Innovation, and sustainable innovation are conjugated in the imperative. "We must innovate", whether we are pro-business or green. On the other hand, authors acknowledge that established firms, for example, may be reluctant to adopt sustainable innovation since it may be counter to their interests. The issue then is to study how these firms, with certain specific institutional strategies, try "keeping sustainable innovation on a leash" (Smink *et al*., 2015). It reminds us that innovation, whether sustainable or not, implies winners and losers, supporters and opponents and that it is not natural or evident to be (or become) innovative. That is why sustainable innovation shares a second meaning, which is, surprisingly, not linked to the environment.

It may seem odd at first glance, but sustainable innovation also has a business sense that ignores environmental sustainability. Sustainable innovation in this sense is a lasting innovation in a competitive economy that allows a company to make ongoing profits: innovations must be introduced into a rapidly-evolving economy (Kolovatchev *et al*., 2010). Another meaning within this business sense is sustainable innovation as the potential for a firm to renew and repeat its marketing of new products (Knott, 2003). This meaning is close to what was called "perpetual innovation" (Kash, 1989) within the American economic debate at the end of the 1980s. This amounts to continuously flooding the market with novelties. Novelties can generate new monopoly profits and growth for the country as a whole. The hope at this time was for household debt reduction through renewed growth and improved competitiveness versus Japan, focusing more on exports. Although this period is behind us,

[2] Although the article is specifically focused on sustainable business models, the definition of sustainable innovation offered is representative of the academic field.

we might consider that sustainable innovation, in its business sense, is a revival and a survival of perpetual innovation. This business sense could lead to a different interpretation. In a more positive interpretation, sustainable innovation allows stakeholders with different interests to discuss issues together and perhaps reconcile divergent views. Sustainable innovation, like innovation as a general concept, is polysemic, and this feature fosters its spread and dissemination.

A Normative and a Programmatic Concept

In tackling issues of sustainability with sustainable innovation, a central concern is to conform to the normative dimension of sustainable development:

> "The concept of sustainable innovation is grounded in wider normative concepts such as environmental sustainability or sustainable development". (Boons & Lüdeke-Freund, 2013, p. 12).

Normativeness is a feature shared by both innovation and sustainable innovation. Sustainable innovation benefits from the positive connotation of innovation, which is rooted in contemporary history. Common sense, policy makers and scholars see innovation as a good thing (how can anyone be against innovation?). Innovation indeed has a positive connotation (Godin, 2015b). "Sustainable" adds a supplementary normative content to "innovation". Sustainability is a moral imperative and, consequently, sustainable innovation assumes a normative character. Sustainable innovation is a means to achieving a more sustainable society. Like many other adjectives attached to "innovation" nowadays (e.g.: responsible, frugal, user-centered), it suggests a new normative aspect for innovation, in comparison with the dominant view (economic imperative, key for growth). This normative aspect includes moral issues, environmental respect, participation of new populations (the poor, the users) and reflectiveness about the consequences of innovation.

Yet normativeness does not prevent controversy or debate. It may even be the source of controversy. If someone does not care about sustainability, or if he thinks that human action has no impact on global warming, sustainable innovation is not an issue. Conversely, if someone believes that the planet is in danger, sustainable innovation is a central concern. Generally speaking, many authors in the field could be categorized by the latter view. They assume that one normativeness (sustainability) has to be chosen versus another (business and sometimes employment), remembering in some respects the Weberian war of divinities (values *versus* values).

Like "innovation", "sustainable innovation" is not only normative but also programmatic. Innovation and sustainable innovation are seen as a "solution". As a result, the management field in particular is generally concerned with how sustainable innovation can be supported and enabled. The literature offers conceptual models (Boons & Lüdecke-Freund, 2013), public policies (Nill & Kemp, 2009) and modes of organizational learning (Riviera Vargas, 2011) to this end. Sustainable innovation is part of a specific sub-field of management science called strategic niche management (Schot & Geels, 2008; Smith & Raven, 2012). Indeed "strategic niche management argues that sustainable innovations need niches in which to develop initially" (Smith *et al*., 2014, p. 116), because "niche protective spaces shield the innovation against premature rejection by incumbent regime selection pressures, until the innovation is proved to be sufficiently robust to compete and prosper in

unprotected market settings" (*ibid.*, p. 116). We observe here a shift from sustainable innovation in general to specific innovations. The literature is concerned with topics such as biomimicry (Kennedy *et al*., 2015), solar photovoltaic electricity (Smith *et al*., 2014) or more widely, "green electricity" (Osaki, 2011). One of the issues, for example, is to increase green electricity by assisting people to adopt it and by trying to understand why they are reluctant to do so.

An Elastic Notion

According to the literature, there is one more distinctive feature that characterizes sustainable innovation: elasticity. Sustainable innovation is an elastic notion. It has the ability to be prolonged, a capacity to stretch. It can be mistaken for other terms that are closed, sometimes fuzzy and always polysemic, with no standard or stable definition. Thus, when sustainable innovation is mentioned, adjacent concepts are present or just around the corner. They belong to the same lexical field, and one concept often needs the other. This elasticity enlarges the core of the term and its perimeter. Indeed sustainable innovation has two main synonyms, "eco-innovation" (Hellstrom, 2007; Carrillo-Hermosilla, del Río, Könnölä, 2010) and "environmental innovation" (Hellstrom, 2007; Slovack, Regenfelder, 2016). There is no difference in meaning: the aim is to innovate in the area of environment (e.g.: renewable energy sources, fuels from biomass and water saving) or to transform manufacturing, with less use of resources and more durable material. In that sense, Slovack and Regenfelder (2016) advocate a circular economy of industrial recycling whose principle is to transform wastes into resources.

Sustainable innovation is also close to "responsible innovation" (Stilgoe, Owen, Macnaghten, 2012; Von Schonberg, 2013, Cuppen, this volume), but is not really a synonym. Indeed "responsible innovation", also very fashionable in recent years, especially in European policy circles, seems more focused on institutional issues. It entails a strong insistence on deliberation and procedural democracy that includes citizens as well as ethical issues. It concerns a process more than a result or outcome.

Finally, sustainable innovation is discussed in terms similar to many other terms derived from the concept of innovation in recent years (Gaglio, Godin and Pfotenhauer, 2018). On one hand is "frugal innovation" (Bhatti, 2012), which is a subset of sustainable innovation: innovation with less resources in contexts where infrastructures are not very developed (Gaglio, 2017). On the other hand is "BOP innovation" (Prahalad, 2004; Chakrabarti & Mason, 2014), more durable and often less expensive than sustainable innovation, and capable of benefiting disadvantaged populations both in rich and in poor countries.

This conceptual conflation reinforce the ability of sustainable innovation to travel. Indeed sustainable innovation can enter and circulate into different social arenas or spheres due to its elasticity (its capacity to be prolonged, completed and confused with closed expressions). This conflation also points to the need for reflective analysis whenever the term sustainable innovation is used.

Conclusion

In this chapter, we considered sustainable innovation in light of the concept of innovation. Innovation is an old concept with a rich history. We pointed out three features of innovation as a concept (ability to travel, polysemic, programmatic) and its evolution throughout history (notably, from negative to positive) with a view to understanding why it is so sustainable. This history provides a series of landmarks for putting sustainable innovation into perspective. We unearthed two meanings of sustainable innovation present in the literature – an environmental meaning and a business meaning – and a key feature: elasticity.

The starting point of the chapter was to understand how innovation sustains sustainability. To state it otherwise, what can be said about the association between innovation and sustainability? Why does sustainability need innovation and why is innovation useful to sustainability? The link between sustainability and innovation is not evident. On the one hand, innovation is often understood as achieving or restoring growth within economies and societies that are not sustainable. On the other hand, common sense blends innovation with radical innovation and discontinuous change, over a relatively short term. On the contrary, sustainable innovation is supposed to last a long time, and is not destructive. It is re-constructive, preserves the environment and aims to perpetuate the presence of human beings on Earth. Sustainable innovation refers to the long term and is an invitation to move toward this perspective.

In this sense, sustainable innovation is becoming part of the academic landscape and attracting many stakeholders. Innovation as a concept often generates offshoots and then perpetuates them (Gaglio, 2011). Sustainable innovation is one such offshoot, among others. First, innovation is desirable and respectable as well as sustainable. This “alliance of good” reinforces the strength of the term sustainable innovation and underlines sustainability as a legitimate stake. Innovation sustains sustainability and vice versa because both are collective goals. Like innovation, sustainable innovation is an imperative and a panacea for social problems:

> “Traditional approaches to business will collapse, and companies will have to develop innovative solutions. That will happen only when executives recognize a simple truth. Sustainability = innovation” (Nidumolu, Pralahad & Rangaswani, 2009, p. 64)

All in all, sustainable innovation questions the economy and the market ideology by focusing on sustainability rather economic growth. In so doing, it provides morality to innovation – once again – and contributes to the enlargement of the concept of innovation to dimensions (social, environmental) that are said to ensure sustainability.

References

Bentham, Jeremy (1824), *The Book of Fallacies: from Unfinished Papers of Jeremy Bentham*, London: John and H. L. Hunt.

Bhatti, Yasser (2012), *What is frugal, what is innovation? Towards a theory of frugal innovation*. Working paper available online at SSRN: http://ssrn.com/abstract=2005910 or http://dx.doi.org/10.2139/ssrn.2005910

Boltanski, Luc & Eve Chiapello (2007), *The New Spirit of Capitalism*, London, Verso.

Boons, Franck & Ludecke-Freund, Florian (2013), Business models for sustainable innovation: state-of-the art and steps towards a research agenda, *Journal of Cleaner Production*, 45: 9-19.

Chartier, Roger (1988), *Cultural History*, Ithaca (NY): Cornell University Press.

Carrillo-Hermosilla, J., P. del Río & T. Könnölä (2010), Diversity of eco-innovations: reflections from selected case studies, *Journal of Cleaner Production*, 18, 1073-1083.

Cooperrider, David (2008), Sustainable Innovation, *BizEd*, July/August: 32-38.

Chakrabarti, Ronika & Mason, Katie (2014), Designing better markets for people at the bottom of the pyramid: bottom-up market design, in Geiger, Susie, Debbie Harison, Hans Kjellberg and Alexandre Mallard (eds.), *Concerned Markets, Economic Ordering for Multiple Values*, Cheltenham, Edward Elgar Publishing: 153-177.

Delepierre, Octave (1836), Aperçu historique et raisonné des découvertes, inventions, innovations et perfectionnements, en Belgique, dans les sciences, les arts, l'industrie, etc. depuis les Romains, Bruges: Félix de Pachtere.

England and Wales. Sovereign (Edward VI) (1548), *A proclamation against those that doeth innouate, alter or leaue doune any rite or ceremonie in the Church, of their priuate aucthoritie: and against them which preacheth without licence, set furth the .vj. daie of Februarij, in the seconde yere of the Kynges Maiesties most gracious reigne*, Excusum Londini: In aedibus Richardi Graftoni regij impressoris. Cum priuilegio ad imprimendum solum.

Gaglio, Gérald (2011), *Sociologie de l'innovation*, Paris, Presses Universitaires de France, collection "Que Sais-je?".

Gaglio, Gérald. (2017), Innovation fads as an alternative research topic to pro-innovation bias: the examples of Jugaad and Reverse Innovation, *in* Godin, Benoît & Dominique Vinck (eds.), *Reflexive Innovation: Alternative Approaches to the Pro-Innovation Bias*, Cheltenham, Edward Elgar, 33-47.

Gaglio, Gérald, Benoît Godin & Sebastian Pfotenhauer (2018), X-Innovation: Reinventing Innovation Again and Again, *NOvation*, Forthcoming.

Godin, Benoît (2012a), Innovation Studies: the Invention of a Specialty, *Minerva*, 50 (4): 397-421.

Godin, Benoît (2012b), *Social Innovation: Utopias of Innovation from c. 1830 to the Present*, Working Paper No. 11, Project on the Intellectual History of Innovation, Montreal: INRS.

Godin, Benoît (2014), "Innovation Studies": Staking the Claim for a New Disciplinary "Tribe", *Minerva*, 52 (4): 489-495.

Godin, Benoît (2015a), *Innovation Contested: The Idea of Innovation over the Centuries*, London: Routledge.

Godin Benoît (2015b), Innovation and creativity: a slogan, nothing but a slogan, in Antonelli, C. & Link, A. C. (eds.). *Handbook of The Economics of Knowledge*, New York, Routledge, pp. 7-20.

Godin, Benoît (2016a), Representation of *Innovation* in Seventeenth Century England: A View from Natural Philosophy, *Contributions to the History of Concepts*, 11 (2): 24-42.

Godin, Benoît (2016b), Technological Innovation: On the Origin and Development of an Inclusive Concept, *Technology & Culture*, 57 (3): 527-56.

Godin, Benoît (2018), *Innovation Languages, Discourses and Ideology: a Historical Perspective*.

Godin, Benoît and Dominique Vinck (eds.), (2017), *Reflexive Innovation: Alternative Approaches to the Pro-Innovation Bias*, Cheltenham, Edward Elgar.

Golovatchev, Julius, Oliver Budde and Daniel Kellmereit (2010), Technology and Innovation Radars: effective instruments for the Development of a Sustainable Innovation Strategy and Successful Product Launches, *International Journal of Innovation and Technology Management*, 7 (3): 1-7.

Hansen, Alvin H. (1932), The Theory of Technological Progress and the Dislocation of Employment, *American Economic Review*, 22 (1): 25-31.

Hellstrom, Tomas (2007), Dimensions of Environmentally Sustainable Innovation: the Structure of Eco-Innovation Concepts, *Sustainable Development*, 15 (3): 148-159.

Heyen D. A. (2017), Governance of exnovation: phasing out non-sustainable structures, *Working Paper*, https://www.oeko.de/fileadmin/oekodoc/WP-Exnovation-EN.pdf

Hicks, John R. (1932), *The Theory of Wages*, London: Macmillan.

Kash, Don E. (1989), *Perpetual Innovation*, New York, Basic Books.

Kennedy, E.,Daphne Fecheyr-Lippens, Bor-Kai Hsiung, Peter H. Niewiaroswki and Matthew Kolodzeij (2015), Biomimicry: A Path to Sustainable Innovation, *Design Issues*, 31 (3): 66- 73.

Kivimaa, P. & Kern, F. (2016), Creative destruction or mere niche support? Innovation policy mixes for sustainability transitions. *Research Policy*, 45: 205-217.

Knott, Anne Marie (2003), Persistent Heterogeneity and Sustainable Innovation, *Strategic Management Journal*, 24: 687-705.

Kuznets, Simon (1929), Retardation of Industrial Growth, *Journal of Business History*, 2: 534-560.

Lederer, Emil (1938), *Technical Progress and Unemployment*, Geneva: International Labour Office.

March J. (1991), Exploration and Exploitation in Organizational Learning, *Organization Science*, 2 (1): 71-87.

Miettinen, Reijo (2002), *National Innovation System: Scientific Concept or Political Rhetoric*, Helsinki: Edita.

Morton, Jack A. (1971), *Organizing for Innovation: A Systems Approach to Technical Management*, New York: McGraw Hill.

Nidumolu, Ram, Pralahad, Coimbatore Krishnarao & Rangaswami, Madhavan (2009), Why Sustainability is Now a Key Driver of Innovation, *Harvard Business Review*, September, 57-64.

Nill, Jan & Kemp, René (2009), Evolutionary approaches for sustainable innovation policies: from niche to paradigm? *Research Policy*, 38: 668-680.

Osaki, Ritsuko (2011), Adopting Sustainable Innovation: What Makes Consumers Sign Up For Green Electricity? *Business Strategy and the Environment*, 20 (1): 1-17.

Patterson, John (1850), *Innovation Entitled to a Full and Candid Hearing*, New York: Fowlers and Wells.

Pigou, Arthur C. (1920), *The Economics of Welfare*, London: Macmillan.

Pol, Eduardo and Simon Ville (2009), Social innovation: buzz word or enduring term? *The Journal of Socio-economics*, 38 (6): 878-885.

Prahalad, Coimbatore Krishnarao (2004), *The Fortune at the Bottom of the Pyramid. Eradicating Poverty Through Profits*, Wharton School Publishing.

Radjou Navi, Jaideep Prabhu and Simone Ahuja (2012), *Jugaad Innovation: think frugal, be flexible, generate breakthrough growth*, Jossey-Bass, San Francisco.

Riviera, Vargas and Isabel Maria (2011), Organizational Learning Model for Sustainable Innovation Elements for a New Innovation Approach in Developing Countries, *Projectics*, 7: 37-47.

Rogge K. S & Reichardt, K. (2016), Policy mixes for sustainability transitions: an extended concept and framework for analysis, *Research Policy*, 45: 1620-1635.

Rogers, Everett M. (1962), *The Diffusion of Innovation*, New York: Free Press.

Rogers, Everett M. & Rekha Agarwala-Rogers (1976), *Communication in Organizations*, New York: Free Press.

Schot, Johan & Geels, Franck W. (2008), Strategic niche management and sustainable innovation journeys: theory, findings, research agenda and policy, T*echnology Analysis & Strategic Management*, 20: 537-554.

Slowack, André P. and Max Regenfelder (2016), Creating Value, not Wasting Resources: sustainable innovation strategies, *Innovation: The European Journal of Social Science Research*, online: http://dx.doi.org/10.1080/13511610.2016.1192990

Smith, Adrian & Raven, J. M. (2012), What is protective space? Reconsidering niches in the transitions to sustainability, *Research Policy*, 41 (6): 1025-1036.

Smith, Adrian, Florian Kermn, Rob Raven and Bram Verhees (2014), Spaces for sustainable innovation: Solar photovoltaic electricity in the UK. *Technological Forecasting & Social Change*, 81: 115-130.

Smink, Magda, Marco P. Hekkert and Simona O. Negro (2015), Keeping sustainable innovation on a leash? Exploring incumbents' institutional strategies, *Business Strategy and the Environment*, 24: 86-101.

Stilgoe, Jack, Richard Owen, Richard and Phil Macnaghten (2013), Developing a framework for Responsible Innovation, *Research Policy*, 42 (9), 1568-1590.

Tocqueville, Alexis de (1835), *De la démocratie en Amérique I*, Paris: Gallimard, 1992.

Touchard-Lafosse, George & François Roberge (1822-24), Dictionnaire chronologique et raisonné des découvertes, inventions, innovations, perfectionnements, observations nouvelles et importations, en France, dans les sciences, la littérature, les arts, l'agriculture, le commerce et l'industrie, de 1789 à la fin de 1820, Paris: Louis Colas.

Veblen, Thorstein (1915), *Imperial Germany and the Industrial Revolution*, London: Macmillan.

Von Schomberg, Rene (2013). A vision of responsible innovation, in R. Owen, M. Heintz and J Bessant (eds.), *Responsible Innovation*, London: John Wiley.