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Title	Invention and Development : Toward Schumpeter's early innovation theory
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Citation	Discussion Paper, Series A, 292, 1-10
Issue Date	2015-11
Doc URL	https://hdl.handle.net/2115/60236
Type	departmental bulletin paper
File Information	DPA292new.pdf

Hokkaido University Collection of Scholarly and Academic Papers : HUSCAP

Discussion Paper, Series A, No.2015-292

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November. 2015

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Invention and Development: Toward Schumpeter's early innovation theory

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Keywords: invention, evolutionism, diffusionism, unilinear development, psychic unity

Abstract

It has been the consensus among researchers that Schumpeter clearly distinguished the notions of innovation and invention, even neglecting the notion of invention in his work. Consequently, there has been very little effort made to tackle the relationship between Schumpeter's development theory and the invention theories that were popular in the fields of anthropology and archaeology at that time, making it difficult to grasp how Schumpeter elaborated his own development theory. However, a close examination of his early works demonstrates that Schumpeter's development theory can also be understood in the context of the debates surrounding the notion of invention.

In *Theorie der wirtschaftlichen Entwicklung*, Schumpeter presented his static agent/innovator dyad with reference to ideas or terms used in the debates of invention being conducted around that time by anthropologists and archaeologists. In the present paper, the author seeks to depict the history of the concept of invention, helped by the work of Benoît Godin, and discusses how Schumpeter presented his development theory based on the ideas involved in the invention debates.

JEL: B10, B41, Z13

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1. Introduction

Today, researchers working on Joseph A. Schumpeter, the founder of innovation theory in the field of economics, have in general tended to accept unequivocally the idea that Schumpeter, throughout his career, neglected the implications arising from the idea of 'invention,' arguing that his main focus was on innovation rather than on individual inventions. However, the author considers that we can reinterpret Schumpeter's socio-cultural development theory, particularly his early elaboration of socio-cultural evolution theory, in terms of the lengthy debate on 'invention' that lasted from the mid-nineteenth to the early twentieth century.

Recently, Benôit Godin has made an attempt to locate the origins of early innovation theories within the context of the debates surrounding invention in the fields of anthropology and archeology (Godin 2008, 2013). Godin has focused his studies on the history of innovation research and provided a number of working papers for the Project on the Intellectual History of Innovation on his homepage. Godin explains that the term 'invention', in the present sense, had be used in the mid-fourteenth century to mean "a finding or discovery, namely with regard to knowledge, or science (knowing)" (Godin 2008, p.14). Over the period leading up to the nineteenth century, the term gradually came to be used to express novelty in science, technology or artefact.

In the mid-nineteenth century, this term was sometimes connected to the concept of 'development' as discussed mainly by archaeologists, anthropologists, ethnologists and geologists. They related technological achievement to the developmental stages of civilization, and sought to find artefacts that could be used to define the developmental stages of a culture using the technological achievement in question. They came to be interested in the way in which novelty in technology emerged, and offered some tentative hypotheses or methodologies regarding invention, including theories more analogous to biological evolution.

From the late nineteenth to the early twentieth century, a dispute called 'The Diffusion Controversy' (Godin 2013, p.6) arose, with two different interpretations of invention being offered. According to the first interpretation, the development of technology was regarded as the natural development in the mental abilities of humankind. In these theories, human society and culture developed via fixed, unilinear sequential stages. As a result, the same invention arose simultaneously in many different areas. The supporters of this interpretation were regarded as 'evolutionists'. In opposition to this theory, another group, known as 'diffusionists', hypothesized that

inventions and development were delivered only in restricted areas, and diffused outward to other areas. The more extreme supporters of this view assumed that humankind is basically uninventive, which explained the static nature of primitive man over long periods.

Some of the studies in these fields had a significant influence on the rise of the early innovation theories of Tarde and Schumpeter around the turn of the century, and these topics continued to be debated among economists and sociologists in the U.S. into the 1920s and 1930s (Yagi 2007).

In the present paper, based on a detailed survey of his early works from 1908 to 1912, the author argues that the main concepts regarding invention, as treated by anthropologists, ethnologists and archaeologists, directly affected the early development theory of Schumpeter via anthropologists in the U.K..

2. The concept of 'invention' in the fields of anthropology and archaeology.

In the nineteenth century, topics related to invention were discussed by researchers in the fields of anthropology and archeology as part of their examination of tools devised by primitive people, such as bows, spears, axes, hooks and so on. Most researchers in these fields shared the same theoretical framework; i.e., unilinear evolutionism, the origins of which were not to be found in Darwinism, but rather in Enlightenment philosophy[2]. Marvin Harris explains the characteristic features of the social philosophers of the Enlightenment in eighteenth-century Europe as follows;

> in a more or less remote past the world's peoples had enjoyed a social life which its general simplicity and by the absence of certain specific institutions, such as private ownership of land, centralized government, sharp class differences, and priest directed religions,… This early phase in cultural evolution was referred to as the "state of nature"…, the explanation of how some men had terminated the state of nature and arrived at their present customs and institutions was approached in a fairly uniform fashion.
>
> (Harris 1968, pp.38-39)

Harris also pointed out that, at that time, civilized man thought "himself out of the

[2] We have to note that the meaning of the term "evolution" was used differently from the current usage. Today, the term 'evolution' is used more widely, and sometimes loosely, in the fields of economics and socio-cultural change.

state of nature by steadily inventing more and more reasonable institutions, customs, and subsistence processes" (Harris 1968, p.39). This idea included some optimistic, teleological assumptions that all humankind could evolve toward complete, perfect civilization and was widely shared by philosophers or researchers in the fields of social sciences up to throughout nineteenth century. It is difficult to identify who was the first scholar used the term 'evolutionism' or 'evolutionist'. However, in 1890s, Gabriel Tarde (1890) and Wilhelm Wundt (1892) already used these term meaning ideas or researchers advocating deterministic unilineal development. Schumpeter also referred to the evolutionism in his posthumous book, *The History of economic Analysis* (Schumpeter 1954). Evolutionists fall into five categories such as, (a) Philosopher's Evolutionism (Hegel), (b) Marxist Evolutionism, (c) Historians' Evolutionism (List, Knies, Hildebrand and Roscher), (d) The Intellectualist Evolutionism of Condorcet and Comte, and (e) Darwinism Evolutionism. According to Schumpeter, "in the eighteenth century evolution was naïvely identified progress—toward the rule of *la raison*—that is to say, it carried a value judgement by definition" (Schumpeter 1954, p436). Without Darwinian Evolutionism, all categories seem to share such a value judgement.

The framework of unilinear evolutionism assumed that inventions arose from the natural development of the human mind, and that all societies in all places around the world passed through the same developmental stages. A perfect example of this notion of unilinear evolutionism can be found in an American anthropologist, Lewis Henry Morgan. He defined three sequential stages of development; namely, savagery, barbarism and civilization (these were also divided into seven sub-stages) based on the inventions (for example, the bow, pottery and iron manufacturing) that characterized each stage. He supported the idea of unilinear evolution stating that "[t]he history of the human race is one in source, one in experience, and one in progress" (Morgan 1877, pp.v-vi). The relation between invention and development could also be explained by the idea that "inventions and discoveries stand in serial relations along the line of human progress and register its successive stages" (ibid., p.vi)[3]. The driving force behind development was 'the slow accumulation of experimental knowledge' (ibid., p.3). Thus, invention, the expression of the developmental stage, also evolved in an accumulative manner.

This evolutionistic way of thinking, which assumed that all humankind shares the

[3] While he clearly regarded invention as an accumulation of human experience and progression in nature, he also saw the development of social and civil institutions as derived from "a few primary germs of thought" and "exhibit[ing] a similar register of progress" (Ibid., p.vi), proceeding through the unfolding of nature rather than by accumulation.

same mental abilities and develops along same path, resulted in the concept of 'psychic unity' (Harris 1968, p.15, Alan Barnard 2000, p.100, Trigger 2000, pp. 100-102). As Harris mentions, for most of the evolutionists, the appearance of similar inventions in geographically remote areas (independent inventions) demonstrated psychic unity. This concept was supported by the results of physical anthropology and psychology at that time (Jahoda 2013). However, following this schema, Thomsen and Morgan became aware of difficulties in creating a set of apparent criteria for the categorization of developmental stages based solely on invention. Some anthropologists including Morgan noticed the importance of diffused invention as a factor in simultaneous invention in exceptional cases.

Researchers dealt directly with remains and artefacts, and both art historians and archaeologists, for example, noticed the particular importance of diffusion. Although archaeologists conducted work to fill in the stages proposed by the idea of sequential development, they also began the task of setting out the developmental line for each invention (for example, the evolution of the sword in Northern Europe) using a taxonomy analogous to that used in biology. Archaeologist. While the formulation of a chronological line of artefacts enhanced the general view of accumulative invention, some researchers became aware of the importance of the diffusion and mixing of cultures, through the chronology of the prehistoric period.

Diffusionism was an anthropological and ethnological school that was strongly opposed to evolutionism, insisting that humankind was basically uninventive, and that most of the similar inventions found all over the world could be explained as the result of accidental diffusion. This school was initiated by the German ethno-geographer Friedrich Ratzel in 1890s, and was then continued by German ethnologists such as Leo Frobenius in 1890s, Fritz Graebner and Wilhelm Schmidt as well as the British anthropologists William Halse Rivers and G. Elliot Smith in the early twenty century (Harris 1968, Barnard 2000). They sought to identify the origins of inventions and cultures, and took a serious interest in this field of history.

Gabriel Tarde, a sociologist, and Otis Mason, an ethnologist, focused on providing an explanation of invention itself. They shared the evolutionistic view of accumulative, incremental invention, but they also admitted the importance of diffusion in 1890s as early as Ratzel did. Tarde considered that there are two type of invention processes, namely accumulation and substitution, and said "evolutionists have made the mistake, here as elsewhere, of merging them together" (Tarde 1895=1903, pp.184-185). Latter case was derived by spread of imitation (diffusion). Using archaeological remains, Tarde explained that an invention was determined not by the need for it, but by preconditions

surrounding it, and offered a psychological explanation for the way in which people chose and imitated inventions (Tarde 1895). Mason, on the other hand, admitted that the "evolution of human wants…is a part of the history of invention" (Mason 1895, p.19). He discussed the evolution of a reward system for invention. According to him, the inventor in the early stages of civilization did not receive public recognition. He said the "public recognition and reward of invention may itself be said to have been invented" (ibid., p.14). Both of Tarde and Mason recognized that a great invention was only delivered by transcendent agent not by followers[4].

Now, we can identify two kind of problems regarding the debate of invention. First, does an invention is made independently and simultaneously in many area of world, and continuously developed through decided sequence, or does it diffuses accidentally from peculiar area and would be mixed up with others? Secondly, does invention occurs in every human mind in the same manner, reflecting the mind which is formed by the surrounding developmental stage, or it only happened within genius mind? The author discusses that Schumpeter had some influence from these topics, and his socio-cultural evolution theory reflected these two problems.

3. Joseph A. Schumpeter and the concept of invention

Schumpeter sometimes appeared hesitant to commit himself to the debates on invention. In his book, *Business Cycles*, he said

> [T]he making of the invention and the carrying out of the corresponding innovation are, economically and sociologically, two entirely different things…The social processes which produces invention and…which produces innovations do not stand in any invariant relation to each other and such relations as they display is much more complex than appears at first sight.
>
> (Schumpeter, 1939, pp.85-6)

His academic focus was always on the phenomenon of innovation and socio-economic development via this phenomenon. However, certain aspects of 'socio-cultural evolution'

[4] Most name of researchers in this section can be found in Schumpeter's posthumous book, *The History of Economic Analysis*, Chapter 4, Section 2, titled "Prehistorical-Ethnological Sociology" (Schumpeter 1954, pp. 786-788). Under this title, invention researchers are also included. Only Tarde's name found in title "autonomous sociology" in same section (ibid., p. 793).

in his development theory clearly reflect the debate on invention.

In his first book, *Wesen und Hauptinhalt der rgeoretischen Nationalökonomie* (Wesen), while he showed a degree of concern about difficulty to explain technological development by economics because technological development depends on some conditions like "invention (Erfindugen)" in which "hardly recognize noteworthy regularities (keine beachtenscharten Regelmäßigkeiten aufweisen)" (Schumpeter 1908, p.148), on the other, he admitted the potentiality in the fields of technology for further development of theoretical economics (ibid., pp. 607-612).

In this book, he casted doubt on evolutionistic view. He emphasized the existence of circumstances which "destroy the sequential continuity and shake our system completely (die kontinuität derselben zerstören und unser System von Grund aus erschüttern)", and also made an anthropologist-like mention that "we could never go back a sequence further than we find the same types of goods (konnten wir doch nie weiter zurückgehen, als wir dieselben Arten von Gütern vorfinden)". He illustrate it by saying "we never seek the origin of modern house in stilt house, and the origin of Armstrong canon in shillelagh (Wir könnten nie das modern Haus auf Pfahlbau, die Armstrongrevolverkanone auf einen knüttel usw. zurückfuhren)" (Schumpeter 1908, pp. 180-181).

Two years before publishing this first book, in the winter of 1906, Schumpeter took a lesson of two anthropologists, Alfred Haddon and Edward Westermarck at London School of Economics. Westermarck had skepticism toward determined sequential development of marriage system devised by Morgan (Westermarck 1894), and Haddon used explanation of Flobenius (German diffusionist) for the development of myth in Torres Islands, emphasizing discontinuity of the development (Haddon). After this experience, Schumpeter offered a course for sociology in Czernowitz, and insisted the importance of the manner how to deal with raw data based on scientific procedure when choose a hypothetical theory, referring to the field of anthropology (Schumpeter 1910=2003). The two anthropologists lectures certainly affected young Schumpeter's thought.

However, in chapter seven of the first edition of *Theorie der wirtschaftlichen Entwicklung* (TWE), Schumpeter explained that the amount of technological knowledge increases independently and automatically (natürlich vermehrtsich der Vorrat an technischem Wissen selbständig und selbsttätig) (Schumpeter 1912, pp.479-480) assuming a static economy. We can find the similar explanation in his last book, *The History of Economic Analysis* (HEA), in a section of prehistorical-ethnological sociology. He said that the great majority of evolutionistic ethnologists and anthropologists agreed that

observed behavior or the observed types of physical things that reflect behavior must, on principle at least, be explained in terms of the conditions of the group or tribe to which each finding is to be attributed: that is to say, most ethnologists adhered to what may be called a theory of 'independent origins' and 'autonomous development'"

(Schumpeter 1954, p. 787).

Above sentence reminds us of explanation for pure economics in Wesen and TWE. However, he also argued that only a portion of commercially actualized invention generates development and offers a chance for the entrepreneur to make a profit (Schumpeter 1912, pp.479-481). He also argued "inventions, unless these are for economy on practical meaning, do not cause economic development, but are the result of it. (Erfindungen, soweit sie für die Wirtschaft von praktischer Bedeutungen sind, die wirtschaftliche Entwicklung nicht hervorrufen, sonderrn eher ihre Folge sind)" (Schumpeter, 1912, p. 479).

Here, we face a problem in terms of the relationship between invention and development. Schumpeter regarded invention as an autonomous process, but not as a cause of development. If invention directly leads to development, increases in invention and the accumulation of knowledge would inevitably result in development. However, according to him, an autonomous process does not result in development. Rather, it results in adaptation to the equilibrium, just like adding successive coaches (Schumpeter 1934, p.64). As seen in Wesen, Schumpeter seemed to seek out a factor explaining discontinuity found in sequences of artifacts or society. It would be natural to consider that the notion of discontinuity derived from anthropological results. In HEA, after explaining the evolutionary view of ethnology and anthropology, he continued as follow

Now Graebner and his followers challenged this theory (evolutionism: the author). On the strength of the fact that primitive cultural patterns are very stable over long periods, they denied the independent origins and the autonomous development of such things as similar tools but took the occurrence of similarities as an indication— if not proof—of a common source from which the use of, say, a particular type of button would spread by diffusion instead of being autonomously invented.

(ibid.,p.787)

Schumpeter praised the diffusionists contribution to impart "serious shock to the

evolutionary views of that period and makes quite a difference to what we have called headquarters of sociology" (ibid., p.787). He sought out a "common source" of development in modern capitalism. Now we can identify his position in debates of invention. He emphasized the necessity for special agents to actualize and organize a development by utilizing invention for practical purposes or the entrepreneur's profit. Such special agents create an intrinsically novel state, such as the rail road industry, which cannot be explained by former conditions (i.e., his analogy of the coaches), diffuses into society and promotes discontinuous development.

4. Conclusion

As discussed above, Schumpeter's development theory can be regarded as an extension of the invention debates toward an application to economic analysis. Many parts of his development theories were seemingly affected by the invention debates. Tracing these thoughts, we can find that in the first edition of TWE, he made an attempt to overcome the objective-oriented framework proposed by the evolutionists. Most of the researchers referred to by the author in the present paper were cited in Schumpeter's posthumous book, HEA (Schumpeter 1954), demonstrating that he was very aware of their arguments and theories.

After he moved to the United States, Schumpeter kept up his interest in the debate on invention. As Yagi wrote, he carried on discussions with a number of proponents of the 'sociology of invention', such as Payson Usher, Robert Merton and S.C. Gilfillan, and during his time in the U.S., Schumpeter still sought to explain the relation between invention and innovation (Yagi 2008).

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