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Japanese translations of *natural selection* and the remnants of social Darwinism

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For “the remnant of social Darwinism” in the title, I mean that there still remain some social Darwinian visions implicitly in our everyday Japanese usage. In particular, I will indicate that such remnant can be found in how to use a Japanese term *tōta* (淘汰).

As Prof. Thierry Hoquet and I have shown,² “*tōta*” is a term which has been used for translating Darwin’s “(natural) selection” since the late 19 century by now, and in this article I will show some more details about the term. In the following section, I review the outline about how the term *tōta* was adopted as the translation of Darwinian selection and its original and derivative meaning. In section 2, I show how and when the Darwinian sense of “*tōta*” entered into word-dictionaries and indicate that we can discern a “remnant of social Darwinism” in this process. In section 3, I turn to more recent usage of “*tōta*” and prove we have inherited the old social Darwinian conception still now.

1. Some preliminary notes on the term “*tōta*”

1-1. How *natural selection* has been translated into Japanese?

As we have shown in the paper,³ from the end of the 1870s to the early 1880s, several translations of “*natural selection*” were attempted: “*shizen tōta*” (自然淘汰) by Suzuki Yūichi (鈴木唯一) in 1878, “*shizen sentaku*” (自然選択) by Inoue Tetsujirō (井上哲二郎) in 1878, “*tensen*” (天撰) by Ishikawa Chiyomatsu (石川千代松) et al., in 1879, “*shizen kanbatsu*” (自然簡拔) by Katō Hiroyuki (加

藤弘之) in 1879, “*ten’nen sentaku*” (天然撰択) by Kōzu Senzaburō (神津専三郎) in 1881. But it seems that after 1880, “*shizen tōta*” became the only standard translation of the concept, and this situation was almost unchanged throughout the pre-war period, the period before 1945. Whereas, in the post-war period, the *kanji* (Chinese characters) restriction policy questioned the term. For *Tōyō kanji hyō* (当用漢字表, *the list of kanji for general use*) issued in 1946, doesn’t contain neither “淘 (*tō*)” nor “汰 (*ta*)”, and thus since the 1950s, *Japanese Scientific Terms* (the official guidebook) and the high-school textbooks began to introduce and counsel to use the new (or revived) term, “*shizen sentaku*”, in which “*sentaku*” is more literal and lexical translation of “selection”. The propagation of this new term was very slow, but since the mid 1970s, it became a popular term until now.⁴ Nevertheless, also “*shizen tōta*” is still used broadly, and there is some evidence of its revival.

1-2. The original sense of “*tōta*” and several derivative senses of it

Again as we have shown,⁵ according to several dictionaries, the word “*tōta*” is composed from “淘 (*tō*)”, which means “washing by water”, and “汰 (*ta*)”, which means “water becoming muddy”, and the most original sense of it is “sorting minerals by soaking them in water”. This original and literal sense is still present in the field of mineralogy and geology now, referring to both artificial screening procedure and natural sorting process of sediments.

From this original sense, a sense follows directly, which is “doing some sorting process, in order to retain desirable things and to reject undesirable things”. In principle, such process can be used either to *pick up desirable things* or to *discard undesirable things*. Conceptually, both aspects (picking up and discarding) are interrelated and each aspect presupposes the other. For example, in the case of getting gold by *tōta*, this process can be seen as both “selecting gold dust” and “rejecting valueless sands”.

For this reason, Tarumi Yūji (垂水雄二) insists that in virtue of such original sense of “*tōta*”, this term is very suitable for translating “*natural selection*”

because Darwin himself characterized the process in such a way: “This preservation of favourable variations and the rejection of injurious variations, I call Natural Selection” (*the Origin of Species*, Chapter 4).⁶ If it is Darwin’s intended meaning, the literal translation, “*shizen sentaku*” is only partial translation of *natural selection* and fails to catch the full intention of Darwin.⁷

This is an understandable suggestion. Yet, it may be noticed that, at least today, “*tōta*” seems to have mainly the negative sense of “to reject something”. I admit, for example, that when a Japanese hears that some competitors “experience or suffer *tōta*” (淘汰を受ける, “*tōta o ukeru*”) in which “*tōta*” is used in noun, then she or he might conceive that there is a process which preserves the winners and rejects the losers. But when she or he hears that, in verb, something or someone “is *tōta*-ed” (淘汰される, “*tōta sareru*”), she or he must conceive that the thing or person is eliminated or dismissed. Besides, in the field of animal breeding, *tōta* is used exclusively as the translation of *culling* or *rejecting*, in contrast to *senbatsu* (選抜), a term used as the translation of (artificial) *selection*. Today such negative connotation is found in both Japan and China,⁸ and this seems not so new because we can find such meaning in several word-dictionaries or textbooks of breeding science written in the pre-war period.

2. *Tōta* can bear the Darwinian sense in itself

2-1. When was the Darwinian sense of “*tōta*” registered in word-dictionaries?

Further, also as we have shown in that paper,⁹ there is a noteworthy fact about “*tōta*” in word-dictionaries: present word-dictionaries, almost without exception, mention the Darwinian meaning of “*tōta*”, and therefore this term can bear the Darwinian meaning even if it occurs solely, without the modifier *shizen* (or other similar modifiers, such as *jin’i* (人為, artificial), *sei* or *shiyū* (性 or 雌雄, sexual) or *hindo-izon* (頻度依存, frequency-dependent), etc.). In contrast, such a strong association with the Darwinian concept is not found

about “*sentaku*”.¹⁰

Already, we have cited two typical examples from the two standard Japanese word-dictionaries, in our paper.¹¹ One is this:

1. To sort by washing. Derivatively, to take away bad things and to select and keep good things. [* I omit examples] 2. In a biological population, for only the class of individuals which have certain characteristics to propagate, that is a phenomenon in which fit ones are selected and unfit ones are taken away. Darwin classified it into artificial selection, natural selection and sexual selection. [* I omit examples] (① (「淘」も「汰」も水で洗う意) 洗ってより分けること。転じて、悪いものを除き良いものを選び出すこと。〔用例省略〕 ②生物集団で、特定の形質をもつ個体群だけが特に繁殖するようになることで、適者が選ばれ、不適者は除かれる現象。ダーウィンはこれを人為淘汰・自然淘汰・雌雄淘汰に分けた。〔用例省略〕)¹²

(*Nihon kokugo daijiten* (『日本国語大辞典』, *the Unabridged dictionary of the Japanese language*), Shōgakukan (小学館), 1972)

The other is this:

1. To remove out useless things; to reject improper persons. 2. (selection) A phenomenon in which those which are fit to their environments or conditions survive, and those which aren't die. *sentaku*. (①不用の物を除き去ること。不適当の者を排除すること。② (selection) 環境・条件などに適応するものが残存し、そうでないものが死滅する現象。選択。)(*Kōjien* (『広辞苑』, *the Broadened word garden*), the 6th edition, Iwanamishoten (岩波書店), 2008)

Later, I attempted to figure out exactly when such meaning began to be mentioned explicitly in word-dictionaries. For though I had been already certain about that most of recent dictionaries contain this meaning whereas

many pre-war dictionaries don't, yet I was not certain about when such change had occurred. Thus I looked through a database offered by the National Diet Library¹³ and in effect I believe I have found seemingly the earliest case was in 1938 (before the WWII), which is contained in an dictionary edited by Shinmura Izuru (新村出), who is also the author of *Kōjien*. Also, with comparing entries of “*tōta*” in several dictionaries edited by Shinmura, I found some patterns of development, which should be unnoticed if we look at only the latest edition of *Kōjien*.

Now I list the entries of “*tōta*” in order, from the earliest to the latest dictionaries edited by Shinmura:¹⁴

To wash out. To remove useless things. (洗ひ去ること。不用の物を去ること。) (in *Jien* (『辞苑』, *the Word garden*), Hakubunkan (博文館), 1935)

1. To take good things and to remove useless things. 2. As the result of the struggle-for-existence, for improper ones to be rejected” (①よいものを取り、不用の物を除くこと。②生存競争の結果、不適當の者が排除せられること。) (*Gen'en* (『言苑』, *the Language garden*), Hakubunsha (博文社), 1938)

1. To wash and rinse. 2. To take good things and to remove out useless things. 3. As the result of the struggle-for-existence, for unfit ones (or things) to perish” (①あらいすすぐこと。②よいものを取って、不用のものをのぞき去ること。③生存競争の結果、不適なもののがほろびること。) (*Shinjisen* (『新辞泉』, *the New word fountain*), Seibundō (清文堂書店), 1954)¹⁵

1. To wash and rinse. 2. To remove out useless things; to reject improper persons. 3. A phenomenon, in which, by the principle of survival-of-the-fittest, among the organisms, those which are fit to their environment or condition survive, and those which aren't die. There is natural selection and

artificial selection. (①あらいすぐこと。②不用の物を除き去ること。不
 適當の者を排除すること。③適者生存の理により、生物中、環境条件など
 に適應するものが残存し、そうでないものが死滅する現象。自然淘汰と人
 為淘汰とがある。) (*Kōjien*, the 1st edition, 1955)

1. To remove out useless things; to reject improper persons. 2. (*selection*) A
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 survive, and those which aren't die. There is natural selection and artificial
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 と。② (*selection*) 適者生存の理により、生物中、環境・条件などに適應
 するものが残存し、そうでないものが死滅する現象。自然淘汰と人為淘汰
 とがある。選択。) (*Kōjien*, the 2nd edition, 1969 and the 3rd edition, 1983)

Since the 4th edition, the definition became the same as the newest edition
 I have cited above, and the main alteration is deleting the passage, "by the
 principle of survival-of-the-fittest, among the organisms".¹⁶

Comparing these several definitions, we can find several interrelated
 developments or "evolutions" through them. The first is deleting the mention
 to the first and more original sense, "to wash out" or "to wash and rinse" (which
 disappeared in the second edition of *Kōjien* and has never come back). The
 second is deleting the passage, "to take good things" (such deleting is firstly
 done in 1938, and the passage has never appeared in *Kōjien*). The third is adding
 the Darwinian sense of *tōta* (which occurred firstly in 1938, as I noticed).

What was intended by these alterations? Concerning this, it must be said
 that the entries defining "*tōta*" in most of previous dictionaries had mentioned
 the sense of "to wash" and "to take good things" and hadn't mentioned the
 Darwinian sense.¹⁷ This is understandable because, in general, dictionaries tend
 to be too conservative and therefore it sometimes happens that some obsolete
 senses or usages remain in them. So it seems natural to suppose that these three

alterations came from the intention to criticize the previous dictionaries and to update the content of the dictionary, in estimating that “to wash out”¹⁸ and “to take good things” were already obsolete (which we have suggested from other evidence) while the Darwinian meaning was well established at that time. Perhaps such an intention is almost the only reason of alterations in a word-dictionary.

It can be said that, of the three trials for updating, the third one ---- the adding of the Darwinian sense ---- has been the most widely accepted. For whereas we can find recent dictionaries which don’t accept the first and the second innovations (that is, there exist modern word-dictionaries which contain “to wash out” and “to take good thing” in their definitions of “*tōta*”), yet, as we have noted, perhaps every recent word-dictionary mentions that Darwinian meaning of “*tōta*”. Besides, it can be noticed that the renewal of the entry of “*tōta*” by adding the Darwinian meaning seems to have been rapidly and widely accepted in other word-dictionaries since the 1950s, as I have looked through.¹⁹ From these facts and considerations, we may safely suppose that the Darwinian sense of “*tōta*” was diffused and permeated in the pre-war age.

2-2. An obsolete usage of “*tōta*” and its probable social-Darwinian origin

The dictionaries edited by Shinmura seem to have tried to introduce another, more subtle updating to the previous dictionaries. The resulting updating can be seen from the following passage in *Kōjien* (underlines are added by me):

To remove out useless things; to reject improper persons. 「不用の物を除き去ること。不適當の者を排除すること。」(*Kōjien*, of every edition)

I notice that the second half of this passage (“to reject improper persons”) seems to capture an usage of “*tōta*” which is perhaps near obsolete in the 21st century, but nevertheless seems to have been still living in the 1950s.²⁰ In this usage, it typically means “to fire or dismiss employees or personnel”. For

example, *Nihon kokugo daijiten* cites a passage from a novel of Natsume Sōseki (夏目漱石) published in 1910, which refers “the *tōta* of officials”.²¹ Also, some old dictionaries published in the early half of the 20th century offer such idioms as “*jin’in tōta*” (人員淘汰, “cutback or reduction of personnel”), “*jōin tōta*” (冗員淘汰, “cutback or reduction of excess personnel”) or “*rōkyū tōta*” (老朽淘汰, “dismissal of old personnel”). Though I have not researched this subject systematically, such idioms sound not so familiar at least for me. For example, if required to express the same thing as “*jin’in tōta*”, I would say “*jin’in seiri*” (人員整理).²²

I suggest that it is a “remnant of social Darwinism” which I mentioned in the title because (1) it is an usage which is applied to human or social affairs explicitly and (2) the very similar wording can be found in the descriptions of Darwinian meaning of *tōta* in the previous dictionaries edited by Shinmura. To make this clear, compare the following two passages which I have already cited (again, underlines are added by me):

1. To take good things and to remove useless things. 2. As the result of the struggle-for-existence, for improper ones to be rejected” (①よいものを取り、不用の物を除くこと。②生存競争の結果、不適当の者が排除せられること。)
(*Gen'en*, 1938)

... 2. To remove out useless things; to reject improper persons. 3. ... those which are fit to their environment or condition survive, and those which aren't die. ... (…②不用の物を除き去ること。不適当の者を排除すること。③…環境条件などに適応するものが残存し、そうでないものが死滅する…)
(*Kōjien*, the 1st edition, 1955)

Similarities are evident. Both passages contain such phrase as “to reject improper ones (persons)” (不適当な者が(/を)排除せられる(/する)), but in the former, this phrase occurs in the sub-entry which describes *the Darwinian*

meaning while in the latter it is *transposed into* the sub-entry which describes more ordinary meaning. Perhaps along with this transposition, the writer made a distinction between “物” (things) and “者” (persons) explicitly,²³ and rewrote the wording in the description of the Darwinian sense “improper ones” (不適當の者)“ into “ones which aren’t (= fit to their environment or condition)” (そうでない (= 環境条件などに適応しない)もの).²⁴ We may also notice the replacement of “to be rejected” (in *Gen'en*’s description of the Darwinian meaning) for “to die” (in *Kōjien*), the latter of which seems less anthropomorphic. Thus, we may say that the passage “to reject improper ones (persons)” is primarily intended to capture a *Darwinian process applied to socio-human affairs*. But perhaps lexical exactness required to make explicit its more standard biological meaning also, so that the strict biological definition became included into the entry. As the result of this, the real situation has been less visible.

I say that the sense of *tōta* as “to reject improper persons” used in such idioms as “*jin’in tōta*” or “*jōin tōta*” is near obsolete sense in the 21st century, and it may be said that this is a *remnant of social Darwinism in word-dictionaries*. Though this is undeniable, yet it is not the full intention of my title. Further, from the above citations, it should be inferred that, when the editor or writer of *Jien* decided to include the sub-entry of “*tōta*” which described the Darwinian meaning of the term, his primal intention seems to have captured *the social Darwinian usage or usage of Darwinism applied to human social affairs*. It means that the editor or writer seems to have intended to update his dictionary by introducing the social Darwinian sense into the definition of “*tōta*”.

Here I am not suggesting that the editor or writer embraced the social Darwinian policy, but instead that the writer or editor discerned that such usage of “*tōta*” was well established in Japanese language in those days. If this reconstruction is correct, it should be true not only that *tōta* as “to reject improper persons” was a widely diffused social-Darwinian metaphor in Japan (instead of derived directly from the classical sense of “to wash and rinse” or “to

select carefully”),²⁵ but also that such socio-human application of the Darwinian idea was more prevalent than its strict biological application at that time.

Thus it can be said that the “remnant of social Darwinism” could be situated at the heart of modern use of “*tōta*” itself. As we know, from the 1880s to the beginning of the 20th century, social Darwinian thought was made very influential mainly by Katō Hiroyuki or other ideologues.²⁶ Even after then, Darwinian thought had often been connected to socio-human process in the pre-war period. What I mean by “the remnant of social Darwinism” is the remnant of this historical movement which can be found in our everyday linguistic practice, as if a fossil.

Perhaps further we may ask if the modern Darwinian or social Darwinian usage of “*tōta*” exerted a greater influence over our culture than we have imagined. One possibility is that the diffusion of the negative meaning of “*tōta*” as “rejection” might be due to the diffusion of the social Darwinian usage.²⁷ Another possibility is that the popularity of the term “*tōta*” itself has emerged after it had been adopted as the translation of Darwinian selection. We know Katō Hiroyuki once translated “natural selection” as “*shizen kanbatsu*” (自然簡拔) in his unpublished draft for a lecture.²⁸ Today, it is hardly to say “*kanbatsu*” is a popular term comparable with “*tōta*”.²⁹ But it is worth asking how this situation would change if Katō had used “*shizen kanbatsu*” in his published works instead “*shizen tōta*”.³⁰

3. The still living social Darwinian usage of “*tōta*”

3-1. Another usage of “*tōta*” in popular magazines of business or marketing

I said that the “social-Darwinian” usage of “*tōta*” (exemplified as “*jin’in tōta*”) is near obsolete today. But I will argue that there exists another living usage which can be seen as “social Darwinian”.

Such usage can be found very frequently in magazines of business or marketing, such as *Shūkan-Tōyōkeizai* (『週刊東洋経済』, *the Weekly Eastern*

Economy), *Nikkei-Business* (『日経ビジネス』, the business magazine issued by the Japan Economic Times Company) or *Keizaikai* (『経済界』, the *Economic Circles*), etc., and we can detect a very uniform sense in them. To characterize it, such use of “*tōta*” is usually intended to capture in a metaphorical way the “survival or die” in the “struggle for existence” *within market*. A very popular usage is “the industry of ____ will rush into the age of *tōta*”, whose blank is filled with for example “banking”, “computer-software”, “automobile”, “convenience-store” or “karaoke-box”, etc.

I said that such uses are very frequent. For example, according to a database,³¹ in 1999 the number of those articles containing “*tōta*” in their title or keywords is 178 (which is the largest per year), and 170 of these articles use the term in such sense. Most of those 170 articles are contained popular magazines and many of them are short columns while all of the other 8 articles are treatises in academic periodicals,³² so that it is not so informative simply to compare their numbers. But nevertheless such a result is notable because it makes clear the fact that, outside biology, there exists a widely diffused use of “*tōta*” which may be seen *Darwinian* and, in particular, *social-Darwinian*, different from the older use of “dismissal of personnel”,³³

It can be also noted that the frequency of such usage of “*tōta*” has a distinct pattern. According to MAGAZINEPLUS,³⁴ articles of such magazines which include “*tōta*” in their title or keywords were not so many (though not very few) until the mid of 1990s. But about 1996 or 1997, their number grew drastically, and since then the number has not so decreased by now. In the following I show the numbers of such articles contained three magazines of business or economy in every 5 years since 1981 (I note that every article uses “*tōta*” in the unitary usage I explained):³⁵

years	<i>Shūkan-Tōyōkeizai</i>	<i>Nikkei-Busines</i>	<i>Keizaikai</i>
1981-1985	1	8	0
1986-1990	5	13	1
1991-1995	24	11	1
1996-2000	256	52	9
2001-2005	181	11	11
2006-2010	177	6	1
2011-	11	2	1

Though what this pattern means is not so unambiguous,³⁶ it seems to suggest that the argumentation of “*tōta*” in such use is related to Japanese economical depression and resulting intensification of market competition. For, almost without exception, such uses of “*tōta*” are related with some competitive process.

Some authors tell more implications of the term “*tōta*” used in such cases.

One example is given by Kitamura Kazuyuki (喜多村和之). From the end of the 1980s to the beginning of the 1990s, he edited and authored two books whose titles contain “*tōta*”: *Gakkō tōta no kenkyū: Daigaku “fushi” gensō no shūen* (『学校淘汰の研究——大学「不死」幻想の終焉』, *Studies on school selection: the end of the illusion of immortality of universities*, Tōshindō (東信堂), 1989) and *Daigaku tōta no jidai: shōhi-shakai no kōtō-kyōiku* (『大学淘汰の時代——消費社会の高等教育』, *The age of university selection: higher education in the consumption society*, Chūōkōronsha (中央公論社), 1990). In the former book, Kitamura explicates in detail why he uses the term “*tōta*” for this subject.³⁷ At first he cites the entries of “*tōta*” from *Kōjien* and *Nihon kokugo daijiten* and notices the latter says “*tōta*” has dual meaning “to pick up” as well as “to reject”. Then he makes clear that he will use “*tōta*” in this dual meaning because such term can comprise various changes of educational institutions, such as newly establishing, abolition, meager, etc. Next, he refers to the second sub-entries in the dictionaries which mention the Darwinian sense, and indicates explicitly that the dynamism of educational institutions is parallel to the Darwinian

process in that there is “the selecting mechanism that determines which will survive and which will die” (「生死を分ける選択のメカニズム」) (*Gakkō tōta no kenkyū*, pp.7-8).³⁸

Another more recent and, I say, more stereotypical and less reflexive example is found in a book written by Kawame Masayoshi (川目正良), titled as *Ikinokoru byōin, tōta-sareru byōin* (『生き残る病院、淘汰される病院』, *Hospitals to survive and hospitals to be extinct (be tōta-ed)*, Subaru-sha-linkage (すばる社 リンテージ), 2008). In this book the writer warns that, though hospitals have been an exception to market-principle, soon they will be thrown into market mechanism and experience “the principle or providence (*setsuri*, 摂理) of natural selection” (p.2). I say that this example is stereotypical and thus not so reflexive. But just for this reason, it illustrates the average concept of this kind of use of “*tōta*”.³⁹

These and other examples share some common characteristics. That is, they present a largely similar vision that some area of social activity (included several industries, education, medical service, etc.) will be thrown into the field ruled by the universal market-principle, and the term “*tōta*” is intended to refer to the dynamism of market or competition. Perhaps in almost every case, such a use of “*tōta*” is connected to the Darwinian meaning if not always explicit. As we have shown, Kitamura mentions the Darwinian idea explicitly and Kawame uses the very term “*natural selection*” to denote the market mechanism.

3-2. More detailed meaning of “the remnant of social Darwinism” presented here

I have said we can detect “the remnant of social Darwinism” in these examples. But now I must refine and clarify what I am saying. For, though the outline is rather clear, there are several factors which complicate the situation.

Firstly, it is not the case that the above authors call themselves “social Darwinists”. Almost certainly there are not such authors.⁴⁰ The point I insist is that the “social Darwinistic” meaning is built into the term “*tōta*” and that not only those writers but also most of us Japanese use it less cautiously. Then,

those cases I cited or mentioned are intended as examples of our linguistic or cultural fact.

Secondly, when I mention “social Darwinism”, I mean a specific thought which existed in particular age, rather than every kind of application of Darwinian idea to socio-human affairs, in general. Recently there are several attempts to apply Darwinian idea to various subjects which are not restricted within animals or plants: for example, evolutionary psychology, behavioral economics,⁴¹ meme theory of cultural evolution,⁴² or evolutionary studies of religion,⁴³ etc.⁴⁴ Here it may be reminded that Darwin himself got his idea by a kind of interdisciplinary way (from Malthus’ theory),⁴⁵ and I declare that these recent (mostly after the 1980s) attempts are prolific and hopeful research-project if only researchers will be enough cautious of the potential danger of its decaying into unempirical ideology.

Indeed, so-called social Darwinism was such a mere speculative ideology. On such thought, Tarumi Yūji makes some useful suggestions in his recent book.⁴⁶ According to him, so-called “social Darwinism”, such the theory as Spencer’s social evolutionism, is indeed an application of pre-Darwinian transformism to human society.⁴⁷ Thus, like Bowler,⁴⁸ he says such position should be called not “social Darwinism” but “social Lamarckism”, in the sense that it supposes a linear and somehow teleological inner force of development, which requires violent competition as its means. Such an idea should turn Darwinian evolution or “descent with modification” into a “progress” along single path, and claims that such progress shall be attained by the principle of “*jakuniku kyōshoku*” (弱肉強食, “the stronger eats the weaker” ---- a classic idiom used as an old translation of “survival of the fittest”). On these grounds, Tarumi insists that such an idea is “too remote from Darwin’s moderate idea according to which ones fitter to their environment will leave more descendants” (pp.139-147). As I have said, in Japan, Katō Hiroyuki represented just that position, and I say we have inherited its remnant in a fossilized form.

As for the two typical examples of recently using “*tōta*” I cited, I say both of

them get their “Darwinian” implication from that fossilized social Darwinism, rather than from more recent attempts for application of Darwinian idea outside standard biological subjects.

In Kitamura’s case, his research seems rather discreet, and perhaps it might be possible that his studies would be assimilated to more recent Darwinian approaches. Nevertheless, it is undeniable fact that Kitamura relates his idea not with any recent evolutionary approaches (which were not absent in the latest 1980s) but with the *word-dictionaries* and thus our inherited fossilized concept of *tōta*.⁴⁹

On the other hand, in Kawame’s case the fossilized idea is more apparent. In particular, his wording is worth noting. For he calls the “*natural selection*” of market “providence” (*setsuri*). Such quasi-religious expression betrays an implicit nuance of “*tōta*” in such usage.⁵⁰ To force an explicit articulation from that nuance, it may be a quasi-religious faith that *shizen tōta* or *natural selection* should bring something good or some general progress as a compensation for the defeats of competition. It is the very idea which I mentioned as so-called “social Darwinism”.⁵¹

Thirdly, though I find the remnant of old social Darwinism within the term of *tōta* itself, I would not claim that we should abolish “*shizen tōta*” from biology or from our ordinary vocabulary, and instead we should adopt the other alternative, “*shizen sentaku*”. Though it may be noticed that, as far as looking through databases, “*shizen sentaku*” is almost always used within biological articles and therefore it seems to lack the complicated nuance which “*shizen tōta*” has, yet this fact seems not so compelling reason for preferring “*shizen sentaku*” to “*shizen tōta*”. Anyway, it should be said that such replacement will not touch our fossilized preoccupation itself. Besides, the very popularity of “*tōta*” might be turned into its merit, I guess.

Concluding remark on “reception and resistance”

In concluding this article, I will remark that our topic can be seen as a story about *reception* of and *resistance* against several external elements. Firstly, the element was Darwin's idea which was entwined with Spencer's idea. “*Tōta*” was a product of the reaction (which contained both *reception* and *resistance*). The introduction of “*shizen sentaku*” came from the Occupation Forces originally, but it encountered the *resistance* for “*tōta*”. The recent proliferation of “*tōta*” seems to have two possible sources, both of which are external. One is the re-introduction of neo-Darwinism in the late 1970s to the 1980s, which extinguished anti-Darwinian theories such as the holistic theory of Imanishi Kinji (今西錦司) or the Lysenkoist theory of Tokuda Mitoshi (徳田御稔), while multiplying the neo-Darwinian research using “*shizen tōta*” (as well as “*shizen sentaku*”) in the field of biology. The other source is the so-called neo-liberalist thoughts and policies which rose about the 1990s and since then seems to have multiplied “*tōta*” in that fossilized sense. Both movements are only parts of much broader change (for example, also in France, Darwinism is not so powerful by the 1980s⁵²), and the two may be interrelated in a subtle way.⁵³ We may be still in doing our *reception and resistance*.

Notes

1. In this article, the names of Japanese persons (including myself) are given according to the Eastern order, namely, family name first, followed by the individual's name.
2. Taizo Kijima & Thierry Hoquet, “Translating “*natural selection*” in Japanese: from “*shizen tōta*” to “*shizen sentaku*”, and back?”, in *Bionomina*: 6, 2013, pp.26-48. <<http://dx.doi.org/10.11646/bionomina.6.1.2>>
3. See section 3.1 and 3.2 in Kijima & Hoquet 2013, in particular table 2, which was originally taken from Isono Naohide (磯野直秀), “Shinkaron no Nihon eno dōnyū” (「進化論の日本への導入」. “The introduction of evolution into Japan”), in Moriya Tsuyoshi (守屋毅)(ed.), *Mōsu to Nihon: kyōdō kenkyū*. (『モースと日本——共同研究』, *Morse and Japan: a collaborative research*), Shōgakukan (小学館), 1988, pp.295-325.
4. Perhaps a milestone was the new translation of *the Origin of Species* by Yasugi Ryūichi (八杉竜一) published between 1963-1971, which adopts “*shizen sentaku*” --- an ironical fact because Yasugi had been one of the school-textbook writers who had

attempted to preserve the term “*shizen tōta*” in the 1950s.

5. See section 4.1 and 4.2 of the article.
6. Tarumi Yūji, *Nayamashii hon'yakugo: Kagaku Yōgo no yurai to goyaku* (『悩ましい翻訳語——科学用語の由来と誤訳』, *Annoying [or glamorous] translated terms: the origins and mistranslations of the scientific terms*), Yasakashobō (八坂書房), 2009, pp. 98-100.
7. As Hoquet once noticed, when Darwin used the term “*selection*”, this use seems to have been in a special sense of “breeding” (“action of a breeder in selecting individuals from which to breed, in order to obtain some desired quality or characteristic in the descendants”), in his “Translating natural selection: true concept, but false term?”, in *Bionomina*: 3, 2011, pp.1-23 (p.7). <<http://dx.doi.org/10.11646/bionomina.3.1.1>>. Thus, that too literal translation “*sentaku*” may fail to catch the special concept.
8. A modern Chinese-English dictionary defines “*tōta*” as: “(1) eliminate through selection / competition; (2) die out” (John DeFrancis et al. (ed.) *ABC Chinese-English dictionary: alphabetically based computerized*. Honolulu: University of Hawai’i Press, 1996, p.586.
9. In section 2.2.
10. There may be exceptions in technical articles of evolutionary biology, where it is evident that, from the context, “*sentaku*” signifies Darwinian process only.
11. In section 2.2.
12. This detailed definition is seemingly sound, but not without question. The word “*kotaigun*” (個体群), which I translate as “the class of individuals”, is usually the translation of *population* in biology, and in the standard view, population is not the unit of natural selection.
13. National Diet Library Digital Collections: <<http://dl.ndl.go.jp/>>. I went there to search the archives which can be read in the library only, on May 29, June 2 and 6, 2014.
14. I will omit some derivative idioms in the dictionaries, for example *tōtahō* (淘汰法, filtering method, in mineralogy) or *tōtaban* (淘汰盤, filtering board, a tool in mineralogy).
15. *Shinjinrin* (『新辞林』, *the New word forest*, Seibundōshoten (清文堂書店), 1953) and *Kokugo hakujiten* (『国語博辞典』, *the General national word-dictionary*, Kōchōshorin (甲鳥書林), 1957) give almost the same definition, but instead of “for unfit ones (or things) to perish” (不適なもののがほろびること), it is stated that “for improper ones (or things) to be removed out” (in *Shinjinrin*, 「不適なもののが排除されること」 and in *Kokugo hakujiten*, 「不適当なもののが除き去られること」), which is the same (or similar) wording as *Jien*.
16. This alteration is understandable because *survival of the fittest* is originally intended as the synonym for *natural selection* by Darwin and thus it is not proper to use the former in the definition of the latter.
17. I must note that it is true that many of previous dictionaries contain the entry of “*shizen tōta*” (or “*shizen tōta setsu*”, in which “*setsu*” (説) means “theory”) with very detailed definition (for example, in *Dai Nihon kokugojiten* (『大日本国語辞典』, *the Great Japan national language dictionary*, Fuzanbō (富山房), 1928) or *Nihon daijiten: Gensen* (『日本大辞典 言泉』, *Language fountain: the Japanese Great dictionary*, Ōkurashoten (大倉書店), 1929)). But these dictionaries don't mention the Darwinian sense in their entries of “*tōta*”.
18. A seeming evidence that the sense of “to wash and rinse” was already obsolete at

that time is an illustrative sentence of “*tōta*” in *Dai nihon kokugo jiten*. This sentence is taken from *Tōshisen kokujikai* (『唐詩選国字解』, the Japanese translation of the selected poems of Tang, 1791) and says “What is *tōta*, is to sort out the gold which is mixed with sands by soaking them into water and in effect to get pure gold” (「淘汰は金と云ふものは砂の中に混じってあるを水にひたしてえりわけておいて、そうして真金にすることぢや」). This example seems to suggest that even in the 18th century, the sense of “to wash and rinse” was already obsolete. Another indirect evidence is that, in the earliest writers on evolution, there were many erroneous scribings of the Chinese letters of “淘汰 (*tōta*)”, such as “淘汰”, “淘汰” or “淘汰” (see the table 2 mentioned in note 3). These mistakes tend to lack *sanzui* (“氵”), the Chinese radical which signifies “water”, and this fact might suggest that, at that time, the original meaning of “淘汰” was less conscious of. (But I admit a possibility that it might be only due to unskillful printing of those days.)

19. Another significant fact is that many dictionaries simply reiterate Simnura's oldest description of the Darwinian meaning, “As the result of the struggle-for-existence, for improper ones to be rejected” (生存競争の結果、不適当の者が排除せられること). As I have found from the database, (restricted before the publication of *Kōjien*) two word-dictionaries in 1951, two in 1952, one in 1953 and three in 1954 give the same or almost similar descriptions. Still now, we can find the description which is apparently based on it with slight modifications, such as: “As the result of the struggle-for-existence, for ones that cannot adapt to their environment perish.” (生存競争の結果、環境に適応できないものが滅びること) (*Shin meikai kokugojiten* (『新明解国語辞典』, the New clearly-understandable national word-dictionary, the 6th edition, Sanseidō (三省堂), 2005). Though this is improved in several points (for example, replacing “improper (不適当)” for “that cannot adapt to their environment (環境に適応できない)”), yet it is clear that it is based on the description in Shinmura's dictionaries published in 1938, 1953 or 1954 (see note 15).
20. Therefore, I think that description in the newest edition of *Kōjien* is better to be revised.
21. 「多数の噂に上った局員課員の淘汰 (タウタ) も月末迄に略片付いた」(*Mon*, 『門』, the Entrance)
22. In part, such change of use may be due to the *kanji* restriction policy. At least it is the fact that both of “整” (*sei*) and “理” (*ri*) are included in the *Tōyō kanji hyō*.
23. At least in modern Japanese, whereas “もの (*mono*)”, written in *hiragana*, can signify both impersonal things and persons, yet “物 (*mono*)” signifies exclusively impersonal things and “者 (*mono*)” signifies usually persons. (Though, in classical use, “者 (*mono*)” may have broader use and such use remains in such wording as “前者、後者” (*zensha, kōsha* / the former, the latter).)
24. One might say that the word “*futekitō*” (不適当) which occurs in the descriptions of the Darwinian meaning may not be translated into “improper” --- a value-laden term --- but instead into “unfit (to their environment)” --- a more value-neutral term. Surely the word means originally “irrelevant” or “out of place”, and thus may be understandable as more value-neutral one. But seeming that it is applied to exclusively persons in *Kōjien*, it is more natural to suppose that the term has already borne a value-laden meaning. Revisions of “*futekitō*” into “*futeki*” (不適, “unfit”) in *Shinjisen* or “*sōdenai* (= *tekiosurumono denai*)” (そうでない (= 適応するものでない), “those which aren't (adaptive)”), in *Kōjien* leads the similar conclusion.
25. Even if it would not be the case and the “dismissal of personnel” would be older

than the Darwinian usage, then the term “*tōta*” should already have a sociological connotation when it was adopted by the writers such as Katō Hiroyuki.

26. On the prosperity and decline of Japanese social Darwinian thought, see, for example, Julia Adeney Thomas, *Reconfiguring Modernity: Concepts of Nature in Japanese Political Ideology*. University of California Press, 2002 (ジュリア・アデニー・トーマス著、杉田米行訳『近代の再構築——日本政治イデオロギーにおける自然の概念』、法政大学出版局、2008年)。
27. This possibility was suggested by Tarumi Yūji in an email.
28. This draft can be read in the following book: Yoshida Kōji (吉田曠二), *Katō Hiroyuki no kenkyū* (『加藤弘之の研究』, *A study on Katō Hiroyuki*), Ōharashinseisha (大原新生社), 1976, pp.268-325.
29. One current use of “*kanbatsu*” is to make a complex noun “*kanbatsuzai*” (簡抜材, “logged wood” or “thinned wood”) but this word is often scribed as “間抜材” or “間伐材”。
30. There is a bit surprising example, which evidences that the Darwinian meaning (though in this case it is not Social-Darwinian any way, I say) has been permiated in Japan. That is an lexical desciprtion of “*tōta*” in a dictionary of geology (The Association for the Geological Collaboration in Japan (AGCJ, 地学団体研究会) (ed.), *Shinpan Chigaku jiten* (『新版地学事典』, *The New Edition of The Dictionary of Geology*), Heibonsha (平凡社), 1996:

Tōta sayō (とうたさよう 淘汰作用) sorting, (German) Sortierung, (French) classement, granulometrique, (Russian) сортировка

In general, it means a process by which, from a group which contains heterogeneous members, one or more homogeneous sub-groups are sorted out, or are made from that. In biological evolution, such process is called *shizen tōta* (natural selection) when it proceeds under natural condition, and called *jin'i tōta* (artificial selection) when it proceeds under human governance. In sedimentology, it means a phenomenon in which, from a heterogeneous material whose ingredients have different origins, several particles or grains are sorted and accumulated according to their kinds, sizes, forms, specific gravities. The sorting by grain-size is particularly called *bunkyū sayō* (分級作用) or *shibetsu* (篩別) (sieving), and for this there are attempts to formulate it mathematically. [Yamashita Noboru (山下昇)] (*Translator's note: According to other dictionaries, “*bunkyū sayō*” is also translated as “sorting”, so that I don't translate this.)

不均一あるいは不均質な個体の集りからなる一群の集団から、ほぼ均一あるいは均質な個体からなる一つまたはそれ以上の部分的集団が選び出される、あるいはいくつかの部分的集団が形成されること。生物進化論においては、この作用が自然の諸条件のもとで行われるとき自然淘汰 (natural selection)、人間の管理のもとで行われるとき人為淘汰 (artificial selection) という。堆積学においては、雑多な起原をもち、不均一な集団である原材料から、運搬の過程を通じて、粒子の種類・粒度・形状・比重などに応じた分別と集積が行われる現象を淘汰という。粒度に応じた淘汰を特に分級作用または篩〔し〕別 (ふるい分け) 作用といい、その程度を数学的に表現する方法も考案されている。〔山下昇〕

I believe that such an attempt to integrate Darwinian selection and sedimental sorting is driven by the strong Darwinian connotation built into the term “*tōta*”.

31. I used Zassaku-plus <<http://zassaku-plus.com>>, on May 7, 2014.

32. Of the 170 articles, 3 are in an academic journal, titled as *Gakkō-keiei kenkyū* (『学校経営研究』, *Studies on school management*). Other 8 articles are of biology, breeding, mathematics (treating the artificial life simulations) and history. The first three use “*tōta*” in original Darwinian sense. The historical studies use it in that obsolete sense such as “*jōin tōta*” in mentioning historical literatures. Besides, there is another group of articles which belong to geology and use “*tōta*” in its more original sense which is never Darwinian --- though such articles were not included in our sample published in 1999.
33. I note that such a recent usage is not very new. For example, there is an article titled as “*Kin'yūkai ni okeru shizen tōta*” (「金融界ニ於ケル自然淘汰」, “On natural selection in the financial circles”) published in 1916, which was originally authored by Ellis T. Powell and partially translated by Tokame Seiji (十亀盛次) in *Keizaigaku shōgyōgaku kokumin keizai zasshi* (『経済学商業学国民経済雑誌』, *the National journal of economics: economics and commercial science*), according to Zassaku-pulus (see note 25).
34. Though I had got the essentially same result, this is based on the newest result of my search in 24, June 2014.
35. Since the databases are not completed, we must be cautious not to take the result always reflecting the real situation of publications. For example, Zassaku-plus and the NDL-OPAC (offered by the National Diet Library) cover those articles in popular magazines which were published after the mid 1996. Ōyasōichi-bunko covers ones published after the mid 1980s. MAGAZINEPLUS covers ones published since 1981 and here I use it. Perhaps more restricted but more comprehensive database is offered by Nikkei Business Publications, Inc., which covers the articles published after the 1970s though only in the magazines of the publisher. According to this database, during the 1970s, such articles published in *Nikkei-Business* two times, in 1975 and 1976.
36. One possible factor which might explain the increasing of *tōta* is the relaxation of the *kanji* restriction policy, which seems to have proceeded year by year.
37. Besides, he notices that he rendered the terms “*daigaku tōta*” or “*gakkō tōta*” from Shinbōri Michiya (新堀通也), in the postscript of the former book (p.327). But at present, I have not found Shinbōri's use of *tōta*.
38. I will translate and cite the text below:

The reason why we use the word “*tōta*” is that we think it is suitable term to comprise the process and mechanism of such phenomena as newly-establishing, abolition, merge or integration. . . [“I omit the following citation from the two which we have already seen in section 2-1.”]. . .

Both dictionaries says the term has a derivative sense, which is the synonym for “*sentaku*” (selection) . . . [“I omit the following citations.”] . . . Both dictionary tells that is used as Darwin's artificial selection and natural selection by means of the survival of the fittest.

To apply such meaning to our research interest, we can define the term *gakkō tōta* as the dynamism by which educational institutions are established or abolished. Since our primary interest is, in particular, to reveal the selecting mechanism that determines, among the present institutions, which will survive and which will die, so we have considered the term to be able to comprise such phenomena.

Now, to give concrete examples of the phenomena of *gakkō tōta* and *daigaku tōta*, we say that the term *tōta*, which we borrow from the evolutionary theory, is intended to express the selectional phenomena in which some of once established educational institutions continue to exist but others disappear. In particular, the term of *gakkō tōta* and *daigaku tōta* can cover the establishing, extension, integration, merge, switching, abolition, etc. of educational institutions, in historical or social context.

本研究で「淘汰」というコトバを用いたのは、これが教育機関の新設・廃止・統合・合併等の変化現象の過程やメカニズムを包括するのに適当な用語と考えたからに他ならない。…〔中略（辞書の引用と第一義の解説）〕…。

第二義としてはいずれの辞書も「選択」（selection）と同義とし…〔以下辞書の引用〕…いずれもダーウィンの適者生存による自然淘汰・人為淘汰の意味を用いている。

以上の語義を我々の研究テーマにあてはめるならば、学校淘汰とは教育機関が新設されたり廃止されたりする動態を示し、とりわけ既成の教育機関のうち、あるものは発展し存続していくが、あるものは衰退し消滅していく過程であり、既成の教育機関としての組織体としての生死を分ける選択のメカニズムの解明を志しているわれわれにとって、まさにこうした現象を包括的に含意する用語と考えたのである。

ところで、学校や大学の淘汰現象とは、具体的にはどのようなことを意味するのであろうか。ここで本書で使用する「淘汰」とは、教育機関が設立後、なんらかの理由ないし条件のもとで、あるものは存続し、あるものは消滅していくという選択（selection）現象を、進化論の用語を借りて表現したものである。具体的には、教育機関の新設、増設、統合、合併、移行、廃止などの現象を歴史的、社会的なコンテクストにおいて包括した意味で用いている。

39. Again, I will translate and cite the text:

The forcible reduction of the number of beds or the price of medical care or medicines leads to the reduction of the market-volume of medical service. In such a situation, the principle [or providence (*setsuri*, 摂理)] of natural selection should work. By making clear distinction between hospitals to survive and hospitals to be extinct [or *tōta*-ed, *tōta-sareru*, 淘汰される], the balance of demand and supply will be sustained.

In order for a hospital to survive in market, it needs to exhibit its distinctive character which others don't have. Today, hospitals must make clear their own merits and appeal their quality, or else, they wouldn't be chosen by government or patients anymore.

When we look back the past, after the collapse of the bubble-economy, financial institutions or other Japanese companies, all of which had been guarded in the “convoy” [護送船団, *gosō-sendan*] way, were deprived of their guard in a moment and thrown in the middle of the field ruled by the world-wide market-principle. Then, some companies have survived by their self-cleansing effort and developing new services giving users high-quality satisfaction, and others suffered bankrupt or purchased, due to their failure to do innovations.

Today, hospitals go to the same turning point. The owners of hospitals confront a choice: to renew their medical service for their survival, or to leave the market.

病床削減や診療報酬・薬価カットが断行されることは、医療サービスの市場規

模が縮小されることを意味する。マーケットボリュームが小さくなれば、そこには自然淘汰の摂理が働く。「生き残る病院」と「淘汰される病院」とが色分けされながら、医療サービス市場における需要と供給のバランスが保たれていくのである。

病院が市場で生き残るには、他の病院との明確な差異化が必要である。もはや病院は、はっきりと自院の強みを確立し、その優位性を訴えなければ、行政や患者に選ばれない時代になったのである。

振り返れば、バブル経済崩壊以降、金融機関など、護送船団方式で守られていた日本企業の多くは、一瞬にしてその保護を解かれ、地球規模の競争原理のまっただ中に放り込まれた。そこで、自浄努力によって顧客満足度を高めるサービスを積極的に開発し、提供した企業は生き残り、イノベーションを怠った企業は、倒産や買収の憂き目に遭った。

今まさに、病院もこうした転換期を迎えている。生き残るために医療サービスを刷新するか、さもなくば市場から退出するか、経営者は選択を迫られているのである。

40. I am thankful to Professor Paul Dumouchel for indicating this ambiguity in my talk.
41. See e.g. George Ainslie, *Breakdown of Will*. Cambridge University Press, 2001. (ジョージ・エイズリー著、山形浩生訳『誘惑される意志——人はなぜ自滅的行動をとるのか』NTT出版、2006年)。
42. This idea is first introduced by Richard Dawkins in the last chapter of his (first edition of) *The Selfish Gene*. Oxford University Press, 1976 (日高敏隆、岸由二、羽田節子訳『生物 = 生存機械論——利己主義と利他主義の生物学』紀伊國屋書店、1980年。1991年に原著増補章を追加し『利己的な遺伝子』と改題)。
43. e.g. Pascal Boyer, *Religion Explained: the evolutionary origins of religious thought*. Basic Books, 2001 (パスカル・ボイヤー著、鈴木光太郎・中村潔訳『神はなぜいるのか』NTT出版、2008年) ; Daniel C. Dennett, *Breaking the Spell: religion as a natural phenomenon*. Viking, 2006 (ダニエル・C・デネット著、阿部文彦訳『解明される宗教——進化論的アプローチ』青土社、2010年)。
44. A turning point which occasioned such recent evolution-based studies was the publication of E. O. Wilson's *Sociobiology: the new synthesis*. (Belknap Press of Harvard University Press, 1975, エドワード・O・ウィルソン著、伊藤嘉昭他訳『社会生物学』思索社 1983-1985年) and the sociobiology debate which followed after the book. See e.g. Ulica Segerstråle, *Defenders of the truth: the battle for science in the sociobiology debate and beyond*. Oxford University Press, 2000 (ウリカ・セーゲルストローレ著、垂水雄二訳『社会生物学論争——誰もが真理を擁護していた (1, 2)』みすず書房、2005年)。
45. I am thankful to Professor Thierry Hoquet for indicating the connection of Darwinism itself and social theories in his question to my talk.
46. Tarumi Yūji, *Kagaku wa naze kokai sarerunoka: wakarinikusa no riyū o saguru* (『科学はなぜ誤解されるのか——わかりにくさの理由を探る』, *Why science is misunderstood: seeking the reason of difficulty*), Heibonsha (平凡社), 2014.
47. More detailed study on this point is offered by Peter Bowler in his book, *The Non-Darwinian Revolution: Reinterpreting a Historical Myth*. Johns Hopkins University Press, 1988 (ピーター・J・ボウラー著、松永俊男訳『ダーウィン革命の神話』朝日新聞社、1992年)。
48. See previous note.
49. Perhaps one notable difference between Kitamura's case and Kawame's case is in

that while Kawame uses “*tōta*” in verb and means only rejecting process, Kitamura uses it in noun and emphasizes its two-ways function of preserving-and-rejecting. (However, Kitamura also tells in the postscript of cited book that he will be glad if these studies “will contribute not only to further analyses of *tōta* of schools, but also to further planning for *survival* of schools or universities with helping educational institutions on improving their quality and exerting their vitality” (「学校の「淘汰」の分析にとどまらず、学校や大学の「生き残り」の戦略に役立つと共に教育機関の質の向上と活力（バイタリティ）の発揮を促す一助となることがあるならば」, p.328), in which “*tōta*” signifies rejecting process only.)

50. Though his intended meaning might not be utterly religious but only a synonym for “principle” or “natural law”, yet I think it is still right to call it quasi-religious.
51. A journalist Suzuki Keisei (鈴木傾城) critically and neatly formulates such a quasi-religious belief on progress-by-competition-principle in his criticism to TPP as an entry of his blog. I cite the passage in my translation:

The way of thinking which has sustained the competition-principle is the following: (1) By competition, everyone improves each other [切磋琢磨される, *sessa takuma sareru*]. (2) The finest thing (or person) survives. (3) Due to the finest thing (or person), the society goes on developing. Such a way of thinking is similar to the idea of Darwin's evolutionary theory, according to which [living things] have survived by adapting to their environment, and it sounds very comfortable [心地よい, *kokoti yoi*]. It is the idea called “survival of the fittest”.
<http://www.bllackz.com/2013/10/blog-post_14.html>

It is regrettable that he is trapped into a stereotypical image of “Darwin's evolutionary theory”, and more regrettable is that today such image seems rather the average one in Japan.

52. cf. Ernest Boesiger, “Evolutionary Biology in France at the Time of the Evolutionary Synthesis”, in Ernst Mayr and William B. Provine (eds.), *The Evolutionary Synthesis: Perspectives on the Unification of Biology*, Harvard University Press, 1980, pp.321. (But I noticed that once Professor Jean Gayon said to me that this report seems not so correct.)
53. For example, Tarumi indicates that the popularity of *the Selfish Gene* of Dawkins synchronized with the rise of neo-liberalism in economics (see Tarumi 2014, p.9).