Laws of Fertility, Role of Natural Selection, and Destructiveness of Mutations

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Abstract

Research into fertility has revealed facts that are incompatible with selectionism, the modern concept of evolution. In whatever species, fertility is never so close to the most productive (optimal) level that it would guarantee survival of most of the offspring. This is a radical contradiction of the selectogenesis theory, which postulates that 1) the level of species fertility has been attained because of selection, and 2) any individual modification of fertility is a matter of adaptation. Neither fertility itself nor its modifications have anything to do with Darwinian adaptation or with increased population growth; actually, they hold the population stabilized within certain limits. It is not the maximization of individual fitness (also known as the reproductive success) that makes up the basic principles of life organization, but allocentrism (the availability of self-limiting properties of species that are advantageous to the ecosystem as a whole, i.e. are good for the mutual benefit of all the species). Despite permanent natural selection for elevated fertility, the distribution of fertility in any species remains invariable. This phenomenon proves the perfect destructiveness of the mutation process. Undoubtedly, mutations that increase fertility have occurred and continue to occur, but do not become fixed because they diminish fitness on the whole. Therefore, selectogenesis cannot be a factor of fertility or of any other character less associated with fitness than fertility, and the creationist concept of the species invariability is thus confirmed. A short classification of cosmogonies is given. Denying the miracle of creation, evolutionism is forced to admit another miracle—the inactivity of the second principle of thermodynamics. Likewise, atheistic science turns out to be inimical to reason and morals.

Laws of Fertility: The Role of Selection and the Meaning of Fertility Modifications

Fertility means here the number of young in a litter of viviparous animals, the number of eggs in a clutch of birds and other egg-laying species, or the number of seeds in a plant formed within one year or growing season. The number of an individual's offspring that survive and live to reach puberty is the reproduction success (RS). In brief, fertility is the potential and RS is the actual productivity of one reproductive cycle of an individual.

The distribution of fertility and RS values at its various levels has been studied in many animal and plant species. Based on these data, the mean fertility $\bar{x}$ in the population and the optimal fertility x_0 (at which RS is maximized) are presented in Table I for various species. In all cases, the mean fertility $\bar{x}$ is much lower than the optimal fertility x_0 ($x < x_0$), so that optimal fertility is often beyond the limits of fertility variation in the population, exceeding many of its values, not only the mean.[1] The relation $\bar{x} < x_0$ is well known for many species in other taxa and has no exceptions. Most often it has been observed that as RS increases, so does fertility all over the range of its variation; hence it follows that $\bar{x} < x_0$ (Blagosklonov, 1991; Lack, 1954).

This phenomenon contradicts selectionism—the doctrine according to which the fertility level is determined by selection. If selectionism were true, the mean fertility would coincide with the optimal one, i.e. the equality $\bar{x} = x_0$ would be fulfilled. Lack (1954) explains this contradiction by adaptive modification of fertility (AMF) corresponding to the given place and time. For example, small clutches are found where there are poor feeding conditions and large ones in good feeding conditions. As a result, the RS increases from small fertility values to large ones, and the fer-

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[1] Generally speaking, extrapolation of the empirical relations beyond the argument's variation limits is not substantiated (Pollard, 1977); therefore the optimal fertility xzero, if it is beyond the fertility variation limits, is an artificial quantity, useful only for a demonstrative representation of the difference between the limit to which the selection tends and the actual level of fertility.

Table I. The mean fertility $\bar{x}$ and the optimal fertility x_0 in plant, animal and human population

No.[1]	Species and source of data		n[2]	$\bar{x}$	x_0
1	Oat (*Avena sativa*)	Sample 1	99	36.2	646
2		Sample 2	112	38.0	∞[3]
3		Sample 3	119	45.9	∞
4	Wheat (*Triticum aestivum*)	Sample 1	116	6.8	∞
5		Sample 2	120	20.2	74.4
6	Grouse (*Lagopus scoticus*)		153	7.52	∞
7	Partridge (*Perdix perdix*)		3916	14.6	∞
8	Wood duck (*Aix sponsa*)		63	13.8	∞
9	White-bellied swift (*Apus melba*)		885	2.56	5.87
10	Black swift (*Apus apus*)		171	1.99	3.09
11			125	2.0	5.3
12			83	2.16	14.1
13	Starling (*Sturnus vulgaris*)	Early broods	3516	4.48	7.84
14		Late broods	1150	3.89	5.06
15	Great tit (*Parus major*)	Early broods	431	7.21	14.2
16		Late broods	196	5.69	8.43
17		Early broods	235	9.06	∞
18	Blue tit (*P. caeruleus*)		181	10.4	20.1
19	Guinea pig (*Cavia porcellus*)		1104	2.73	5.20
20	Sheep (*Ovis sp.*)	1-year-old ewes	51583[4]	1.32	5.04[4]
21		Older ewes		2.93	
22	Human (*Homo sapiens*)	Caucasians of the USA 1929–1931	>1000[5]	1.012[5]	3.27
23		England and Wales 1956–1960			8.83

[1] References for items: 1–5: Data obtained by the author in 1993; 6: Jenkins et al. 1963, quoted from Wynne-Edwards 1964; 7: Lack 1947[6]; 8: Leopold 1951[6]; 9: Lack & Arn 1947[6]; 10: Lack & Lack 1951[6]; 11: Perrins & Lack 1964; 12: Data obtained by the author in 1999; 13–14: Lack 1948[6]; 15–17: Lack 1950[6]; Lack et al. 1957; 18: Lack et al. 1957; 19: Wright & Eaton 1929[6]; 20–21: Bradford 1987; Stein 1987; 22–23: Stern 1965; Kanaev 1968; Strandskov & Ondina 1947[6]; Allee et al. 1949[6]; Lègarè 1972.

[2] n is sample size.

[3] ∞signifies that as the fertility increases, reproductive success (RS) as a function of $u(x)$ is not maximized at its definite value but increases infinitely, so that it is impossible to calculate the fertility optimum x_0.

[4] Values for both classes of ewes together.

[5] Values for both classes of humans together.

[6] Quoted from Lack 1954.

tility distribution reflects that of trophic conditions in the population. Then the mean fertility is equal to the mean value of fertility optimum under heterogeneous feeding conditions of the population. As support for the existence of AMF, Lack points to fertility variations caused by oscillations of feeding conditions (fertility optimum), and gives an example in owls and other predatory vole-eating birds. In years when voles are abundant, the clutches of these birds are larger, whereas in vole-poor years clutch sizes are smaller. Thereby, according to Lack, the mean clutch size is kept at the optimal level, so that under any feeding conditions the fertility level ensures the maximal RS.

However plausible this idea may seem, it has not found adequate factual substantiation. 1) It relies on the hypothesis that the feeding conditions in the population are very heterogeneous. But the fertility of birds, for example, does not change regularly according to the gradient of feeding conditions, but accidentally, so that its extreme values can be found in places close to each other where there are no reasons to expect contrasting feeding conditions. The mobility of birds and the procuring of food for nestlings by members of different couples in the same feeding places (it is known that the nesting and the feeding territories usually do not coincide) rule out a considerable difference in feeding conditions for broods of the same population. 2) The error consists here in the fact that unless it has been demonstrated that $\bar{x} = x_0$, one may not interpret parallel changes of these two quantities as AMF. From the relation $\bar{x} < x_0$ which is never violated, it follows that when $\bar{x}$ and x_0 decrease simultaneously, the mean fertility $\bar{x}$ undergoes a non-adaptive change, because it does not approach the optimum, but, on the contrary, moves farther from it. Therefore, the parallel changes of $\bar{x}$ and x_0 are not AMF. 3) The existence of AMF is disproved by the fact that its consequence is the constancy of the fertility variation coefficient $V = s/\bar{x}$ at all $\bar{x}$ values within the species. But this is not confirmed for either of the species studied: V values always increases as $\bar{x}$ decreases (because the standard deviation s decreases more slowly than $\bar{x}$ does), which means a decrease of the population's average fitness. Therefore, fertility modifications are not adaptive in the Darwinian sense, but have a regulatory significance in the population and in the ecosystem. This follows from the fact that at a high population density the fertility decreases, i.e. fertility modifications serve as one of the factors regulating the number of individuals of any species.

It has been established that in birds a clutch contains far fewer eggs than a female can lay without any harm to her offspring (Romanov and Romanov, 1959; Lack, 1954), or than a couple can brood without chilling [Lack 1947–1951; Leopold, 1951 (quoted from Lack, 1954)]. The clutch size is as a rule much smaller than the number of nestlings that can be fed to live to adulthood (Blagosklonov, 1991; Lack, 1954). Therefore, birds do not reach their physiological, energetic and trophical potential in reproduction. Wynne-Edwards (1964) tried to explain the limitation of fertility at a non-adaptive level by the fact that group selection for a decreased fertility goes on when highly fertile populations die, because the habitat is destroyed as a result of overpopulation. It is supposed that the action of group selection overpowers that of individual selection, and therefore the problem of selection strength requires special consideration.

In all species, the productivity of large fertility values (in the sense of number of surviving offspring) is usually higher than that of small ones; nevertheless, the mean value of fertility and its limits are maintained at a low level. That is why a constant selection for increased fertility goes on, the strength of which can be measured in two ways: 1) by means of the average coefficient of selection in favor of the most productive (usually the largest) values of fertility in the population, and 2) by means of the selection differential with respect to fertility which, for the sake of comparability in various species, can be expressed in standard deviations s of fertility. These indices of selection for increased fertility in populations are presented in Table II. The average coefficient of selection in favor of the most productive fertility xm in the population is equal to

$$\bar{s}[x_m] = 1 - \bar{u} / u_m,$$

where $\bar{u}$ is the mean RS and um = u(xm) is the most RS in the population. It points to a relative reduction of reproduction in a real population as compared to the maximally possible one, such that the individuals in the population as a whole will have the most productive fertility. So, in man, the reproduction in real populations is by 50–62% lower than as if all the births consisted of triplets and there were neither singles nor twins. The selection differential (SD) is the difference between the mean values of the character in a group of producers of the next generation and in the population that is sampled. Because of the fact that more fertile individuals produce more offspring and vice versa, the mean value of fertility in the producers is calculated with "weights" (formula) – products of RS *ui* at fertility *xi* by its frequency *fi*, which determine the contribution of the given value of fertility to the next generation. The sum of "weights" is equal to the mean RS $\bar{u}$ in the population, so that the absolute SD is

$$SD = \frac{\sum x_i u_i f_i}{\sum u_i f_i} - \bar{x} = \frac{\sum x_i u_i f_i}{\bar{u}} - \bar{x}.$$

From Table II one can see that the normalized SD, otherwise called the intensity of selection (Kirpichnikov, 1979), has a rather large value in all the species ($0.08 < SD/s < 0.62$), so that the absolute SD values often exceed 0.5s. According to common sense, it is never negative or even zero, but, what is more important, such a strong selection

Table II. The mean coefficient of selection *sbar[xm]* in favor of the most productive fertility value *xm* and the normalized selection differential *SD/s* for fertility, where *s* is its standard deviation, in populations of various species.

Species	$\bar{s}[xm]$, %	*SD/s*
Oat	59-61	0.44–0.53
Wheat	52–68	0.33–0.62
Grouse	32	0.19
Partridge	50	0.16
Wood duck	45	0.28
White-bellied swift	13	0.20
Black swift	24–40	0.20–0.43
Starling	12–22	0.18
Great tit	21–53	0.21–0.32
Blue tit	23	0.10
Guinea pig	32	0.29
Karakul sheep	46	0.33
Human	50–62	0.08–0.10
Total limits	12–68	0.08–0.62

for increased fertility is also perfectly constant. That is why there are no reasons to believe that a group, interpopulation, selection for decreased fertility which overrules the effect of the individual, intrapopulation, selection is at work. The number of acts of individual selection per unit time would have incommensurably exceeded the same index for group selection. We would have been able to admit the existence of group selection only if frequent extinction of populations or even of ecosystems had happened. It is actually not the case, although in an ecosystem there are a lot of species and the fertility of each of them must be continuously decreasing due to the group selection. Extinction of populations would have been continuously interrupting the biological circulation and would have been catastrophic. So, the main argument against the hypothesis of group selection, and therefore against selectogenesis, is that had there been selectogenesis, no populations with low fertility would have remained, and since group selection eliminates highly fertile populations, everything would have died out and nothing would have remained to conserve.

In this way, group selection is unnatural, in the full sense of the word. And yet Wynne-Edwards (1964) is correct in stating that fertility has a level that maximizes not individual adaptation, but the stability of the species population and of the ecosystem. Therefore, the clutch size in birds, like fertility in general, has a level that is the most expedient for maintenance of biological circulation in the ecosystem, which is useful for all the species contained in that ecosystem. This confirms the basic principle of organization of life—the principle of collective interest that follows from creationism, i.e. the concept of a reasonable design of the world (Ivanov and Ivannikov, 1997). To summarize, one can formulate the following laws of fertility and selection.

- The fertility of animals and plants varies at a much lower level than that required for maximization of the number of surviving offspring.
- Fertility modifications are not adaptive in the Darwinian sense, but serve for regulation of the species population, i.e. for conservation of the ecosystem and maintenance of biological circulation.
- Neither ordinary natural selection, nor group selection can account for (or develop) the observed laws of fertility. This obliges us to conclude that selectogenesis is impossible in any of these forms.
- Selection works, but it does not create anything. It only conserves the equilibrium of parts, not letting any character or property, even such an adaptive one as fertility, become excessively enhanced; it is a guardian of the species' constancy. The causes of the constancy are quite clear. The final cause, or goal, is conservation of the ecosystem, and the motive, or the direct cause is selection against deviations that violate the concordance of parts in the organism.
- These facts demonstrate a collective interest of all the species in the global ecosystem as the basic principles of life organization. They also confirm the conception of constancy of species and they correlate with creationism—a theory involving the intelligent construction of the universe by the Creator.

The Destructiveness of Mutations as a Result of the Absence of Selectogenesis

An extremely important generalization in studies of natural mutagenesis is the idea of its destructiveness. There is always concern about risk of losing the mutant allele due to contamination of the strain by tolerable alleles. The mutation, because of its destructiveness, can never stand competition with the wild type and is usually eliminated. On the other hand, there need be no fear that the mutant allele will be converted to a tolerable one by means of a new muation, i.e. will be improved, and the former muation will be eliminated due to fixation of this new allele in the strain. It is usually assumed that constructive mutations do arise, but in an extremely infrequent fashion, and therefore much more time is required to obtain them than the time during which we usually keep our mutant strains. We are sure to conserve our destructive mutations in the culture thanks to the fact that their conversion to constructive tolerable alleles by means of mutation is, because of the shortage of time, a practically impossible event. The laws of fertility disprove the assumption that eventually a constructive mutation excelling the tolerable allele will be able to arise.

Why is selectogenesis of fertility absent so that a selection-induced shift between any consecutive generations is zero? This is because fertility variations are non-heritable, modification-depentdnet, but are not mutation-induced variations. Much time has passed, however, since the very beginning of any species, enough time for constructive, adaptive mutations to arise. If these had taken place, they would have served, on the strength of their heritability, as material for selectogenesis of fertility. But since this is absent in all species, one has to conclude that all of them, without exception, were destructive, i.e. harmful for survival and therefore they could not serve as material for selectogenesis. Therefore, 1) natural mutagenesis, because of its destructiveness, is not a factor of biogenesis, and 2) all the normal, tolerable alleles of any gene have not arisen by means of mutations, but were the products of creation and were inherent in the species since the moment of its emergence, or more exactly, since the creation of the ecosystem whose part the species is. Any changes in an optimally balanced system can only worsen it, which is the case in the influence of mutation process on tolerable alleles.

Experiments by W. Johannsen (1903) have demonstrated non-heritability of quantitative characters in pure strains. In populations consisting of pure strains that differ in any quantitative character the efficiency of selection is limited by the fact that a pure strain arises with a maximal expression of the character under selection which cannot be further changed by selection. It was supposed that it was possible to promote selection of the character as a result of mutations (Filipchenko, 1923). From the laws of fertility, however, it is quite clear that, because of the absence of constructive mutations, the effect of selection on the character comes across an insurmountable obstacle, from which the absolute impossibility of selectogenesis in general follows.

Cosmogonies and Their Classification

A cosmogony is an idea of origin of the universe (cosmos) and life. Cosmogonies can be divided into two major groups:

- theistic, or creationistic cosmogonics, and
- atheistic, or evolutionistic cosmogonies.

For an unequivocal understanding of cosmogonies, it is necessary to explain the terms *evolution* and *evolutionism. Evolution*, as Clausius defined it, is any process that goes in accordance with the second principle of thermodynamics, i.e. with an increase in entropy, chaos and dispersion of energy (Berg, 1922). It is in this primary sense that evolution must be understood as *nomen preoccupatum* whose meaning may not be changed to an opposite one, because this will lead to confusion. Therefore, evolution is always a degradation, decay, and is opposite to progress, i.e. increase of order and complexity of organization. As to *evolutionism*, or the "theory of evolution," it is the erroneous idea that evolution is the source of progress and the cause of the cosmos structure—life and any other systems in the universe. Evolutionism denies the transcendental and the supernatural. It assumes that the universe arose without any interference of the Supreme Will, and that it does not contain any intention or purpose (design) as it is transformed only according to immanent laws. Evolutionism is thereby the opposite of creationism—the theory of a rational creation of the universe by God in a transcendental act or series of acts.

Theistic cosmogonies can be subdivided as follows:

- The Creator has created time, space, matter, and life at once in all their complexity, whereupon the universe degrades gradually and continuously according to the second principle of thermodynamics. This is Biblical creationism.
- The Creator created first one system and then created other systems later. He continues to create new ones, while the old ones are degrading. For example, at first He created the whole celestial mechanism containing the solar system, the earth, and the moon. Then He created the biosphere in which, according to the geological chronicles, extinction of fossil faunas and floras happened repeatedly. New fauna and flora formations arose in new acts of creation, on whose basis geochronological units are distinguished in stratigraphy. In this way, the universe did not appear suddenly, but it has had a history in which transcendental acts of creation have alternated with periods of immanent development and gradual decay. This is the creationism of naturalists of G. Cuvier's school, or factological creationism.

The Creator created the universe once, in a germ containing the potentials of complication, whereupon the universe developed by itself, without any interference of His will, according to immanent laws without any supernatural phenomena. This is a transitive, evolutionistic, hybrid creationism that differs from pure evolutionism by recognition of the primary intention and impulse, after which the Creator desisted and did not interfere with universal processes. Subdivisions of transitive creationism are based on the diversity of evolution theories.

Atheistic cosmogonies are all simply different forms of evolutionism in which God is denied as the Creator at all; matter and the universe are eternal and have neither origin nor end. In them the world develops from the primary chaos into cosmos without participation of the Supreme Will and Design. It happens by immanent laws, but it runs contrary to the second principle of thermodynamics, which is believed not to hinder the world's progress. Denying supernatural acts of creation, evolutionism is forced to admit a miracle of the second principle of thermodynamics being invalid despite its universal character.

Despite the facts that disprove it, evolutionism is being imposed on science because of its atheism and moral degradation—not for scientific but for ideological and political reasons. A product of atheism, evolutionism claims that mankind is the only intelligence in the universe, thereby justifying the re-making of nature and society in accordance with the false ideals of scientific and technological progress. Wealth is considered to be the main criterion of "progress," about which Christ says: "You cannot serve both God and Money... What is highly valued among men is detestable in God's sight" (Luke 16:13–15). However, atheistic science embodied in evolutionism has conquered the mind.

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Book Review

What's Darwin Got to Do with It?: a Friendly Conversation About Evolution

by Robert C. Newman, John L. Wiester, Janet Moneymaker and Jonathan Moneymaker

InterVarsity Press, Downers Grove, Illinois. 2000, 146 pages, $10 paperback

A person easily could be fooled by a quick look at this "cartoon" book which is advertised on its back cover as

> a friendly conversation between two professors on evolution and what science can explain about life. Find out what logic's got to do with it. See if the changing beak sizes of Galapagos Islands finches prove Darwinism. And enjoy the exciting adventures of those Darwinian superstars Mutaman and Selecta…

In his back-cover endorsement of the publication Phillip Johnson calls the work a "brilliant critique...and more fun than a barrel of Australopithecines." The publication is all this and more, and it has depth that is not superficially apparent. The authors Newman and Wiester have backgrounds in science and various creation/evolution discussions; and the Moneymakers are specialists in design and illustration.

After a brief Introduction on competing ideas, the illustrated adventure leads to the meeting of Professor Teller and Professor Questor, two biologists who challenge each other's views regarding the origin of life. From page to page the banter flies rapidly like a tennis ball going back and forth, thus forcing the observer-readers of the book to see both sides.

Evolution and creation-science (creationism) both are described as wagon words meaning that they can be used in lots of different ways. For example, evolution usually indicates unguided innovations (minor and major changes) and spontaneous generation of life, all over long periods of time. Whereas creation-science usually refers to "The belief that the earth is no more than 10,000 years old, and that all biological life forms were created in six calendar days and have remained relatively stable throughout their existence" (p. 10). After referring to differences of opin-