# The self-regulation of growth problem for natural selection

*Jerry Bergman*

The core of Darwinian theory is that more animals are born than a land area can typically support, producing competition for limited resources, including food and mates. As a result, competition will occur between the more fit and the less fit. In the end, the more fit will be more likely to survive and pass their genes on to their offspring. The result is the law popularly termed survival-of-the-fittest, which is the main engine of evolution according to Darwinism. However, field research has documented that most mammals, and other animals as well, self-regulate their population in such a way that largely negates the Darwinian survival-of-the-fittest law and thus falsifies the main driver of evolution.

It is a common belief that when a community of animals becomes overcrowded, competition for food and other resources significantly increases. This competition causes Darwinian survival-of-the-fittest struggles, which is the basis of evolution.[1] However, this view vastly oversimplifies the situation. Field research finds that, in general "Animal populations fluctuate in numbers, but the fluctuations occur within definite limits" primarily through self-regulation.[2] One who spent a lifetime researching this problem was University of Aberdeen professor V.C. Wynne-Edwards (1906–1997; figure 1). As a naturalist, he collected a massive amount of evidence from his nature studies that he published in his now classic book on population control. He studied mammals, insects, birds, and plankton.[3] The conclusion of his lifetime of research was that most "animals control their population density at a sustainable level, responding to available resources and limits".[4] They achieve this goal by

> "… spreading themselves out, by limiting litter size (what we might call 'birth control'), and by territorial cues that signal other individuals of their species to respect their property claims. Some beetle species turn to cannibalism when crowded, and though lemmings don't actually jump off cliffs, they do respond to crowding by exploration en masse, and may die in transit."[5]

Mitteldorf and Sagan concluded that the "facts collected by Wynne-Edwards in support of natural population control are manifold and compelling". Furthermore, the "breadth of examples looks even more impressive fifty years" after he published his research. Examples include the fact that whales and elephants have very low mortality rates, and consequently

> "… reproduce much less frequently than their physiology permits. Lions and tigers spend much less energy on reproduction than smaller cats, … because they live so much longer that they would overpopulate if they reproduced more frequently. Flies bred in jars will reach a limited density and then cease to lay eggs, even if plenty of food is provided. Beetles eat their young in conditions of crowding. Mice and other rodents respond to crowded cages by refusing to reproduce, even when they have plenty of food, becoming pugnaciously territorial. Although Wynne-Edwards spoke of density-dependent population control for 'the good of the species' in a way that bridled the selfish gene assumptions of the Neo-Darwinists, these examples are not lightly to be dismissed."[6]

In other examples, when game fish are bred in tanks, the fish population

> "… remains remarkably constant whether a proportion of the fish is periodically harvested or their tank is left undisturbed. Long-lived birds—penguins, auks, condors, vultures, eagles, albatrosses—lay only one egg at a time, even when the physiological burden of producing an egg is trivial. In fact, if the one egg is lost or broken, the bird will replace it … . If the birds can lay two eggs so easily, what stops them from doubling up in Darwin's lottery?"[7]

Wynne-Edwards found that the strong territorial and hierarchical tendencies also resulted in the same density-dependent controls. His predecessor, Sir Alexander Morris Carr-Saunders, compiled a book a generation earlier that was limited to anthropological examples of self-population control. For example, Carr-Saunders found that hunter-gatherer populations were stable for thousands of years before agriculture. The many ways he found overpopulation was avoided included fertility limits, abortion, warfare, mating modifications, and even infanticide.[8] These behavioural responses were triggered for sustainability at the expense of achieving maximal reproduction levels. Mittledorf and Sagan concluded that in

> "… the context of neo-Darwinian theory, population control is just as impossible as programmed gain. But

animals in the wild must have been playing hooky the day that theory was covered. Wynne-Edwards offered a compelling barrage, six hundred pages of evidence for natural population control … [and] the field of evidence in Wynne-Edward's book was never refuted, it became highly unfashionable to talk about the evolution of population control."[9]

Billington, in her textbook, *Understanding Ecology,* wrote that Darwin's struggle for existence and survival-of-the-fittest worldview is contradicted by the fact that

> "A careful observation of a community shows that plants and animals live together in agreement. Every living thing has a will for life to go on. People have the mistaken idea that animals in natural community are enemies. People believe that predators … are waiting—ready to snatch every passer-by. Ethology … the study of an animal's normal behavior, shows that this is not true. Both plants and animals appear to avoid direct competition with others if it might injure or kill them."[10]

She added that due to the enormous inbuilt 'will to live', all living things

> "… 'cooperate' as well as 'compete' with each other. When life is carried on normally in a community, the members live peacefully together. Often one will alert another to a common danger. You can observe this in a city park or street or in a suburban garden where pigeons, sparrows, starlings and other birds live together."[11]

Furthermore, she observed that there may exist

> "… some 'pecking' at the smaller birds who come to feed, but it is not a fight to the death. Watch chipmunks or squirrels feeding and chasing, and you will soon realize that much of the chasing seems to be in fun. If a real fight should develop, the other animals in the area show great concern even though they are not involved."[12]

Animals forced into unnatural situations by humans, such as the thousands we crowd in stockyards together before slaughter, tend to physically align themselves in rather ingenious ways so as to *reduce* conflict. For example, many birds position themselves quite evenly in a pen with respect to the other animals, and those towards the periphery face outward so as to utilize the 'facial distance' in front, and also to provide more facial distance to those animals towards the centre of the pen. Another method described by Krutch is to form a 'truce', such as

> "… when two wolves threaten one another the less aggressive often turns his cheek. This is not a signal to the other one to move in for the kill. The wolf who turns his cheek asks for a truce, and though the snarling continues, the truce is always granted. Turning the other cheek, the wolf teaches us, is not abject surrender but an honorable way to prevent a fight and save the species."[13]

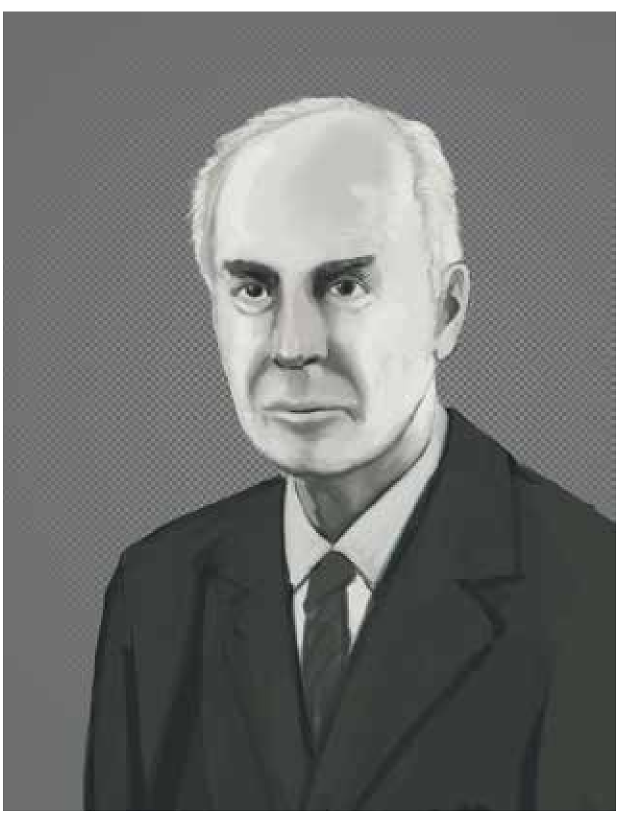

**Figure 1.** Professor V.C. Wynne-Edwards, who spent much of his life documenting the fact that many animals effectively self-regulate their population size

### A study of internal population control

The classic example of an internal factor that limits population growth was by Christian.[14] In the early 1950s he studied the Sika deer (figure 2) population of James Island, a half square mile territory located in the Chesapeake Bay. Five Sika deer were originally imported to the island in 1916. Forty years later, when Christian began his fieldwork, the herd had grown to about 300. Two years after his arrival, the deer began dying off in astonishing numbers for no apparent reason. Over half died within just three months, and by the middle of 1959, only 80 deer were left.[15] Then, as mysteriously as the deaths began, the dying ceased. Research into the cause of these deaths included an examination of their feeding habits, and the possible presence of such factors as disease and toxin exposure.

None of the reasons that he researched could explain either the beginning or the ending of the deaths. A detailed study of their internal organs revealed that *only one difference existed* between the deer that died during the massive deaths in 1959 and those that perished from natural causes: an enlarged adrenal gland. In some cases, it was nearly *twice* as large as

**Figure 2.** The Sika deer of James Island, Maryland, the animal used in the classic study that helped researchers understand one means of instinct population regulation

in those deer that had died at other times. The researchers concluded that the deer had died due to *psychological overcrowding*.

From our viewpoint, the deer were not overcrowded—each one had over an acre of space. But that was evidently enough 'overcrowding' to produce the conditions that caused major enlargement of their adrenal glands, which in turn flooded the deer's systems with adrenalin hormones, causing brain and kidney hemorrhaging. Because deer are non-aggressive animals and cannot reduce their number by fighting, their only response to overcrowding was an innate physiological mechanism that lowers the population level until it reaches an ideal number. As this number was well above the animal's survival requirements, this mechanism would not be a result of natural selection. Furthermore, considerable evidence exists from both

> "… the field and the laboratory that crowding in higher vertebrates results in enlarged adrenal glands, which are symptomatic of shifts in the neural-endocrine balance that, in turn, bring about changes in behavior, reproductive potential, and resistance to disease or other stress. Such changes often combine to cause a precipitous 'crash' in population density."[16]

For example, at the peak of density, snowshoe hares often suddenly die from 'shock disease'

> "… associated with enlarged adrenals and other evidence of endocrine imbalance. In the cyclic insects … on the upswing of the cycle, tent caterpillars (*Malacosoma*) build elongated tents that are shifted about, and the individuals are active in moving out into the foliage to feed. At peak density, the caterpillars become inactive … feed less, and are more subject to disease … . Such adaptation syndromes would certainly seem to be mechanisms for 'dampening' oscillation so as to prevent too great a fluctuation that might damage the ecosystem and endanger the survival of the species."[17]

The tendency to expand up to a certain population level per square mile, and then triggering an internal mechanism to drastically reduce the population, may at first seem non-functional, but necessary to allow the animals to achieve a certain *quality of living*. It is assumed that a mechanism such as this is one way of controlling the population. A creationist would interpret this response as the Creator's way of insuring, not just survival, but adequate survival for the remaining animals; not just life, but a good life. While an

**Figure 3.** The lemming, one of the most well-known examples of population regulation by what amounts to their mass suicide

acre of land could easily support many more than one deer, it generally does *not* insure a high-quality life, but many, slightly undernourished, yet adequately surviving animals. This mechanism helps to insure *healthy, well-fed, strong animals.* It is not yet known how common this mechanism is, but it is evidently present in many non-aggressive animals.[18]

Newer studies have reinforced these findings, adding other factores involved in the self-regulation of populations.[19] All of the self-regulation systems, commonly known as instincts, "require intrinsic behavioral mechanisms that prevent or at least retard population growth prior to the population reaching food limitation".[20]

## Mass suicide

The self-preservation instinct is perhaps the most basic drive found in all living things. Some creatures, such as lemmings (figure 3), frequently commit mass 'suicide', evidently for reasons similar to those that cause Sika deer to commit physiological suicide. When food is plentiful, these mouse-sized rodents with long silky fur lead lives high in the mountains in the icy regions of northern Scandinavia. They flourish on reindeer moss and various roots, and live in cozy underground nests. McFarland noted that, after a few years or so, the lemming population can grow to the level that their food supply is no longer able to sustain them. At this time

> "… the lemmings leave their burrows ... . Like an army heading for a great battle, they swarm out of the highlands and rush downward over the sloping plains. Normally, lemmings fear and avoid water. But, during their mass march ... the lemmings finally reach the seashore, and then, row upon row, plunge headlong into the water!"

The result was the rodents remain afloat for a short time, but soon tire and then

> "… one by one sink to their doom. During a lemming migration, the bodies of the animals can completely cover the surface of the water. One steamer off the Norwegian coast reported that for a full hour the ship had to cut its way through a thick shoal of lemmings swimming out to sea—swimming out to die!"[21]

Why they respond this way is still being debated, but such population control behaviour is a major reason why "very few parts of the earth are in any way crowded with animals".[22]

Calculated by weight, only a few pounds of birds normally live in an acre of land area, and the density of individuals per square mile is typically well below the land's support level. When seen as a flock flying south for the winter, or on an island which serves as a stopping or resting place, it appears that millions of birds live in crowded places. These animals, though, normally live in a very large area.

Although in some areas animal and plant life appears 'crowded', this is often primarily due to human interference. Humans have cut down forests, built farms and cities, and spread rapidly throughout the earth. Historically, at least in modern history, this has been the major disrupting factor in the natural world.[23] Thousands and sometimes millions of birds living in a fairly small area, rarely fighting and displaying little overt competition for food, is common.

If the population increases beyond a 'comfortable' level, the members often may simply spread out to a wider area. When this cannot be accomplished, they may slow down their reproduction rate or, for the reasons discussed above, many will die. This mechanism results in maintaining a certain level of animals living within a given area. The natural selection theory developed by both Charles Darwin and Alfred Russel Wallace were inspired by Malthusian (figure 4) doctrine, a thesis which is largely false.[4] Nonetheless,

> "Darwin and Wallace saw in the Malthusian doctrine a natural law which must apply to all species, and so they deduced that through competition for a limited resource, food, selection must take place between fit and unfit. The Malthusian logic seemed inarguable ... . And undoubtedly supply of food places a theoretical limit on animal numbers, just as there must be cases in which deficiencies of quantity or quality of food contribute to a limiting effect."[24]

Ardrey goes on to add that this view does not result in a theory that is better supported

> "… than that of the self-regulation of animal numbers. Rare is the population that has ever expanded until it reached the limits of food supply. Rare are the individuals who directly compete for food. An infinite variety of self-regulatory mechanisms, physiological and behavioral, provide that animal numbers—except in the case of climatic catastrophe—will never challenge

the carrying capacity of an environment. Birth control is the law of the species."[25]

Evidence that certain areas can support a far greater number of animals than usually exists is also demonstrated by animal domestication. Farmers have been able to graze horses, cattle, and sheep comfortably on an area of land at a density level that one rarely finds in nature. The fact that most land areas can support far larger populations of animals than are usually found in the wild clearly demonstrates that the numbers and types of animals are often *not* being held down by competition. Nor does nature normally overpopulate but, for many reasons, the number of animals is typically far less than a given area could support.

Except for humans, species that tend to populate an area to a greater extent are often not more evolutionarily advanced or much different from other species. Mice, gophers, and rabbits exist in comparatively large numbers per square mile, whereas far fewer anteaters and porcupines usually live in the same space. This may also be one reason why big species are relativity rare.[26] No evidence exists that the mammals which are more numerous are in any way physically more evolved or evolving, as would be expected by neo-Darwinism's survival-of-the-fittest concept.

**Figure 4.** Thomas Malthus, whose prediction that population growth would outstrip the food supply, misled both Darwin and Wallace. From this idea came the struggle-for-existence theory that produced survival of the fittest as a result of the struggle for resources, thus evolution.

## The crowding problem

Admittedly, some examples of aggressive animals exist that fit the picture that Darwin felt nature as a whole exhibited.[27] However, even the better examples, such as rats, at best provide mixed evidence. Both human overcrowding in cities and the poor sanitary conditions such as those in city slums have influenced rodents to behave unnaturally. Rats living in the country typically do not exhibit the aggression typical of city rats. Even so, such crowding and the accompanying viciousness that they exhibit is characteristic of very few animals in the wild, even in crowded conditions.[28] This research also has direct relevance to the problem of the effects of stress on humans.[29]

Another example of self-regulation is that during times of food scarcity, Deer mice mothers consume less food[30] and, "How much a mother eats pre-sets the appetite of her offspring. This effect seems to help keep populations of wild animals stable, and may help them to avoid extinction."[31] Another study found that, although the population fluctuates, when the Arctic ground squirrel population has reached a certain level beyond that which the environment can no longer comfortably support, the females severely reduced their reproduction level, thus controlling the population.[32] Furthermore, the regulation that occurs is triggered mainly by the number of fellow squirrels that are in its environment.

So many examples of self-regulation exist that over 50 years ago Wynne-Edwards concluded that these findings could be generalized, and newer studies have supported his conclusion.[33] Tamarin studied a variety of self-population regulation systems, concluding all were determined by innate behaviour.[34] Field research by Lidicker found various self-control regulations in a variety of small mammals.[35] Lastly, Grant found similar mechanisms in carnivores, ungulates, and primates.[36] Many more studies could be cited that found the same behaviour self-population regulation, but this sample only further documents the findings of all those other studies reviewed.

## Summary

This review documents the fact that many animals self-regulate their population, thus often avoiding the overcrowding problem.[37] Nor does a constant struggle exist in the natural world as Darwinism requires, but rather co-operation is often the norm. All other factors being equal, the larger the population, the more opportunities that exist for mutations to occur, and thus, in theory, Darwinian evolution would be more likely to result. Yet, those species blessed with far greater numbers do *not* seem to be more capable of survival or outwitting their competitors or predators when compared to those that have less dense populations per square mile. These findings both go directly against Darwinian nature's tooth and claw survival-of-the-fittest theory.

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***Jerry Bergman*** *has nine academic degrees, including 5 masters and two PhDs. His major areas of study for his graduate work include anatomy and physiology, biology, chemistry, and psychology. He has graduated from Wayne State University in Detroit, Medical University of Ohio in Toledo, University of Toledo and Bowling Green State University. A prolific writer with over a thousand publications to his credit, including 43 books and monographs, Dr Bergman has taught biology, microbiology, anatomy and physiology, chemistry, biochemistry, geology, astronomy and psychology at the college level. Now retired, he has taught at The University of Toledo Medical College, The University of Toledo, Bowling Green State University and other schools for a total of close to 50 years.*