Missing Regulators: How the Cybernetic Hypothesis Helps Frame Humanity's Tenure on Earth

A small door into a much larger room

At first glance, the Cybernetic Hypothesis of Periodontal Disease in Mammalian Carnivores may appear to concern a narrow veterinary subject: teeth, gums, diet, oral microbes and disease in dogs, cats and other carnivores. That is where the inquiry began. But the significance of the hypothesis lies not only in its implications for veterinary dentistry, pet feeding and systemic disease. Its deeper value may be that it provides a concrete biological example of cybernetic regulation in nature.

For that reason, those concerned with medicine, dentistry, veterinary science, ecology, public health, institutional reform and the future of human civilisation are invited to read and consider the Cybernetic Hypothesis carefully.

This is not a request for uncritical acceptance. Quite the opposite. The hypothesis should be tested, challenged, refined and expanded. But it should not be ignored. It offers a practical entry point into questions that are usually discussed too abstractly: How does nature regulate? What happens when feedback loops are blocked? What happens when a high-leverage regulator is itself dysregulated? What happens when subtle regulation is lost and correction arrives too late?

These questions reach far beyond periodontal disease.

Regulation is distributed

In a mature ecosystem, no single element 'controls' the whole. Regulation is distributed. Plants, prey, predators, microbes, parasites, water supply, climate, shelter, injury, reproduction, competition and death all contribute to communication and control. Every element affects other elements. Every signal has consequences. The system is not mechanical in the simple sense. It is dynamic, interdependent, co-evolved and self-adjusting.

However, distributed regulation does not mean equal regulatory weight. Some elements occupy positions of special leverage. Apex carnivores are one such element. Wolves, lions, wild dogs and other predators do more than kill individual prey. They influence population density, movement, breeding success, fear, feeding patterns, carcass distribution, scavenger activity, disease exposure and vegetation pressure. Their regulatory influence cascades through the system.

The apex predator is therefore not the sole regulator, but a higher-order modulator within a larger co-evolved web of communication and control.

That distinction matters. It prevents crude 'top-down' thinking while preserving the importance of high-leverage regulators. Nature is not a command hierarchy. Nor is it a random collection of isolated parts. It is a network of reciprocal constraints in which some nodes exert greater leverage than others.

The regulator must also be regulated

If apex carnivores help regulate ecosystems, then apex carnivores themselves require regulation. Their effectiveness cannot be unlimited. Their populations, hunting ability, longevity, reproduction and social organisation must also remain subject to constraints.

The Cybernetic Hypothesis proposes that periodontal disease, dentition, diet, oral microbiome, anaerobic bacterial activity, immune response and systemic inflammatory effects may form part of that regulatory apparatus. In the wild, damage to the mouth is not merely a local inconvenience. For a carnivore, the mouth is central to hunting, feeding, fighting, carrying, social signalling and survival. A compromised mouth can alter fitness, behaviour, reproductive success and population pressure.

Regulation may be gentle or severe, continuous or episodic, modulated or catastrophic. In a co-evolved ecosystem, many controls operate quietly and reliably before crisis occurs. Tooth wear, periodontal status, microbial activity, immune response, reproductive limits, social hierarchy, prey availability and predator pressure all provide forms of continuing feedback. They do not necessarily appear dramatic, yet they may help prevent numbers, appetites or behaviours from reaching catastrophic levels.

Other regulators are cruder and less predictable. Drought, flood, famine, epidemic disease, severe injury and starvation impose correction from outside the ordinary preferences of the organism. They may be effective, but they are often late, brutal and wasteful.

This distinction is important. The Cybernetic Hypothesis suggests that periodontal disease in mammalian carnivores may belong, at least in part, to the first category: a modulated, co-evolved regulatory mechanism acting through the mouth, diet, microbiome, immunity and behaviour. By gradually affecting feeding, hunting, fighting, social standing and reproductive success, periodontal deterioration may help regulate apex carnivores before more catastrophic forces intervene.

Seen in this light, periodontal disease is not simply an unwanted pathology. In ecological context it may operate as part of a regulatory interface: an interaction between food, teeth, gums, microbes, immunity, behaviour and environment. What appears as disease at the level of the individual may also function as regulation at the level of the population and ecosystem.

This does not romanticise suffering. It attempts to understand nature’s mechanisms without imposing human sentiment or narrow clinical categories too soon.

Domestication and the broken loop

The problem changes dramatically when humans remove carnivores from their ecological context and feed them artificial diets. Domestic dogs and cats are no longer hunting, tearing, ripping, crunching and processing carcasses in the manner their anatomy, physiology and behaviour require. Instead, many are fed industrial products that bypass or distort the natural oral interface.

The result is not merely ‘dental disease’. It is a broken regulatory loop.

Diet no longer performs its proper mechanical and biological functions. The oral microbiome is altered. Anaerobic processes flourish in abnormal conditions. Local inflammation becomes

chronic. Systemic effects follow. Veterinary practice then treats the downstream consequences while often failing to address the initiating distortion.

This is why the Cybernetic Hypothesis is important. It does not merely ask whether one diet is better than another. It asks whether an entire regulatory system has been misunderstood.

Domestication did not simply make wild animals tame. It placed animals within human-managed systems that often disregard the co-evolved feedback loops by which health, function and regulation were maintained. In that sense, the domestic carnivore becomes both patient and warning.

The human parallel

The wider implications become more sobering when we consider human beings.

Early humans were not exempt from ecological regulation. They were regulated by carnivores, microbes, plants, water supply, shelter, climate, injury, starvation, disease, reproduction, terrain and competition. Among these, apex carnivores and ubiquitous anaerobic microbial processes may have been particularly immediate and powerful regulators. Humans co-evolved within the web, not above it.

Then came weapons, fire, language, social organisation, agriculture, medicine, industry, fossil fuels, global trade and digital technology. Natural selection did not end. Regulation did not disappear. But many of the old feedback loops were weakened, delayed, displaced or overwhelmed.

Humanity did not escape the web; it damaged the web's capacity to correct us in time.

Another way of putting this is that humanity weakened many of the subtle regulators and left itself increasingly exposed to the severe ones. Predators, microbes, hunger, injury, climate, food supply and terrain once provided frequent corrective feedback. Weapons, fire, agriculture, medicine, industry and technology reduced many immediate constraints, but they did not abolish regulation. They postponed it, displaced it and often enlarged its eventual scale.

The danger is therefore not that humanity is wholly unregulated. The danger is that we have weakened modulated correction and invited delayed catastrophe. When fine feedback is ignored or removed, coarse feedback eventually returns.

That may be one of the most important cybernetic lessons of our age.

Apex regulator without restraint

Human beings became the dominant terrestrial regulators. We removed predators, cleared forests, diverted rivers, domesticated animals, transformed soils, spread crops, built cities, mined ancient carbon, transported species across oceans, manufactured chemicals, manipulated genomes and created planetary-scale economic systems.

But in becoming the apex regulator, humanity did not acquire adequate self-regulation.

This is the central civilisational problem. Intelligence became amplification. Technology magnified appetite. Commerce monetised dysfunction. Politics managed expansion. Professions treated consequences. Institutions defended themselves. Journalism often followed spectacle. Regulation lagged behind harm. Science described crises faster than civilisation restrained itself.

The problem is not simply that human beings lack information. The problem is that information alone does not regulate. A system may know that it is damaging its own conditions of survival and still continue. Knowledge does not automatically become restraint.

Nature regulates both from within the co-evolved web and from outside the wishes of the organism. Human institutions prefer to regulate themselves. That is why they so often fail.

First-order and second-order failures

The Cybernetic Hypothesis helps distinguish two levels of failure.

The first-order failure occurs within professions and institutions. Veterinary, medical, dental, academic and regulatory systems should detect harm, investigate relevant questions, correct teaching, warn the public and prevent repeated injury. Too often they do the opposite. They protect established assumptions, reward conformity, suppress uncomfortable evidence and preserve profitable treatment patterns.

The second-order failure is larger. Human civilisation lacks effective cybernetic restraint over its own expansion. Even honest science, ethical professions, independent journalism, effective law and competent administration may not be enough if they operate within a civilisation whose dominant setting is growth. They may reduce abuses while leaving the deeper trajectory unchanged.

That is why the problem cannot be solved merely by making existing institutions more efficient. A more efficient harmful system remains harmful. A better feedback system is not necessarily a wiser one. It depends what the system is trying to preserve.

Cybernetics without ecological humility risks becoming the science of better steering for vehicles already travelling in the wrong direction.

Civilisation’s task is not to abolish regulation. That is impossible. The task is to restore regulation in conscious, modulated and timely forms before reality imposes it catastrophically. The more a system suppresses mild feedback, the more severe the eventual correction is likely to become.

Why this matters for cybernetics itself

Many contemporary discussions of cybernetics focus on business, government, artificial intelligence, organisational control, information systems and adaptive management. These are not unimportant. But they may miss the deeper lesson.

Natural cybernetic systems are not merely internally adaptive. They are answerable to external reality. Drought, famine, predators, microbes, terrain, energy limits, reproductive

constraints and death impose boundaries. These are not policy preferences. They are reality acting back upon the system.

However, not all external correction is alike. In healthy ecosystems, much regulation is continuous, co-evolved and relatively modulated. In damaged systems, correction becomes more likely to arrive as shock: collapse, epidemic, starvation, conflict, flood, drought or breakdown.

Human organisations often prefer internal narratives to external correction. Businesses measure growth. Governments measure activity. Professions measure status. Universities measure funding and publications. Regulators measure procedure. Media measure attention. Each may become adaptive in its own terms while maladaptive in ecological or moral terms.

That is not true cybernetic wisdom. It is internal optimisation without sufficient external accountability.

The Cybernetic Hypothesis brings attention back to nature's harder lesson: systems survive when feedback remains connected to reality, and when correction occurs early enough to prevent collapse.

Why periodontal disease offers a useful starting point

Periodontal disease in mammalian carnivores is not too small a subject for these larger discussions. It may be small enough to be grasped and concrete enough to be tested.

It involves anatomy, diet, microbes, immunity, behaviour, ecology, population regulation, domestication, professional failure, commercial distortion and systemic disease. It shows how a local interface can have organism-wide and ecosystem-wide implications. It shows how an apparently narrow clinical condition may carry broader regulatory meaning.

That is precisely why the hypothesis deserves attention.

A civilisation that cannot understand the mouth of a carnivore may struggle to understand the planet. In both cases, the error begins when living systems are reduced to fragments and feedback is ignored.

More precisely, the error begins when co-evolved regulation is bypassed and the consequences are treated as isolated defects. In the carnivore, the mouth becomes a site for repeated treatment while the dietary and microbial loop remains broken. In civilisation, ecological damage becomes a management problem while expansion continues. In both cases, the deeper regulatory failure remains unnamed.

A call to read, test and discuss

Readers are therefore invited to read the Cybernetic Hypothesis not as a final doctrine but as a working framework. Its importance lies in the questions it opens.

- What is the mouth doing in the life of a carnivore?
- What happens when natural diet and oral function are disrupted?
- How do microbes, immunity, behaviour and ecology interact?

- Can periodontal disease act as both pathology and regulation?
- Can it function as a modulated regulator before catastrophic correction occurs?
- What follows when domestication breaks the loop?
- What parallels exist in human medicine and dentistry?
- What can institutional failures teach us about blocked feedback?
- What can ecological regulation teach us about human overshoot?

These questions deserve careful discussion.

The Cybernetic Hypothesis began with periodontal disease in mammalian carnivores. Its wider implication is that health, disease, professional behaviour and civilisation itself must be understood through communication and control. Where feedback flows, systems may correct. Where feedback is blocked, disease advances. Where external regulators are removed or weakened, self-deception becomes easy. Where self-deception combines with power, harm multiplies.

Humanity's challenge is not merely to know more. It is to become regulatable again.

That requires humility before nature, honesty within professions, courage in public life, and a willingness to examine uncomfortable evidence before correction comes too late.

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