TOWARD A NATURAL HISTORY OF THE PRESENT pdf

1: From Darwin's Origin of Species toward a theory of natural history

An Attempt Towards a Natural History of the Fossils of England, Vol. 1: In a Catalogue of the English Fossils in the Collection of J. Woodward, M. D.; Part 1. of the Fossils That Are Real and Natural, Earths, Stone, Marble, Talcs, Coralloids, Spars, Cryst.

We are unique among animal species in that we survive and reproduce in a wide variety of environments through cultural adaptations Richerson et al. In contrast, other species are primarily able to survive and reproduce due to biological adaptations that result from eons of natural selection and biological evolution. The cultural adaptations of humans have allowed them to colonize nearly every ecosystem type on Earth. In addition, cultural innovations have allowed the human population to grow exponentially for millennia. Such sustained population growth is unparalleled by any other species on the planet. The population of a typical species grows until it reaches the carrying capacity of its environment, then levels off or declines. In other words, it grows until it is fully utilizing the available resources, such as food and space. At this point mechanisms such as disease and starvation keep the population from continuing to grow. However, we humans have responded to resource scarcity with cultural practices and technologies that increase the availability of resources. We raise our food on farms and live in multi-story apartment buildings, increasing the carrying capacity of the environment for humans. This growth eventually requires yet more cultural adaptations to increase resources, and the alteration of the natural environment and the rate of cultural evolution is accelerated. Currently the global human population is large enough and the technologies that allow humans to manipulate the environment are potent enough that human-caused alterations to the biosphere are causing the extinction of innumerable wildlife species. If present trends continue, there will be an eventual crash in the human population that will bring great suffering and cause widespread environmental damage. This is the root cause of the modern environmental crisis. This chapter deals with how we got into the present situation from the perspective of cultural interactions with wildlife and wild lands. Each of these types of societies is generally associated with certain types of social conditions and attitudes toward wildlife and nature. This way of organizing and describing human societies comes from a subdiscipline of anthropology called Human Ecology, which seeks to understand humans by how they interact with the natural world and with each other in order to survive Richerson et al. This is essentially the way that ecologists understand other organisms, so Human Ecology fundamentally sees humans as another species of large social mammal living in the biosphere, while still recognizing their incredible uniqueness as cultural animals. Understanding the history between resource acquisition and attitudes toward nature provides a context for the history of wildlife in North America, which is discussed in the next chapter. It may also provide some clues about how our global culture needs to change if it is to create a sustainable world in the future. The sections below divide societies into five convenient categories for discussion, but they represent a continuum of culture and values, and there are of course exceptions to the sweeping generalities that are made. The important thing to know is the general trend in how different societies relate to nature, rather than how to categorize any given society. This requires intimate, detailed knowledge of plant and animal species in the local environment. A hunter-gatherer lifestyle can support a relatively small number of people in most landscapes, so population densities of hunter-gatherer societies tend to be low. Most hunter-gatherer peoples also are migratory, traveling frequently in search of food rather than living in settlements. Generally each individual in the group is responsible for procurement of food, so there is little division of labor within the sexes. As a result, the social structure of hunter-gatherer cultures tends to be fairly egalitarian. However, this egalitarianism does not necessarily translate into peacefulness. Anthropologists have shown that the incidence of murder in hunter-gatherer societies is generally several times higher than even in the most violent modern cities, which is attributable to the lack of a centralized authority for settling disputes. There tends to be considerable division of labor between the sexes, with men usually responsible for hunting and women for foraging, in large part because it is difficult to take small children hunting. The status of women relative to men in hunter-gatherer societies tends to be roughly correlated with how important foraging is relative to hunting for supplying food, and disparity between the

sexes is generally not as large as seen in agrarian societies. Beliefs and attitudes toward nature and wildlife The direct dependence of hunter gathers on natural ecosystems for their food, and the intimate knowledge of the natural world that this requires, is generally reflected in their beliefs and attitudes toward nature and wildlife. Such peoples commonly view themselves as inseparable from the natural ecosystems and wildlife around them Gottleib , Wilber Animals are often regarded to be another kind of people, or as spirit beings, who can be appealed to for help and protection. Rituals are commonly performed to show respect, gratitude and reverence for the animal-spirits, with the hope of promoting continued hunting success. Other rituals to influence natural events, such as the coming of rain, are also not uncommon in hunter-gatherer cultures. These literal beliefs in magic, ritual and fusion of humans with the natural world are often termed animism Richerson et al. Examples of such beliefs toward nature are shown in both the traditions of numerous Native American cultures, and in the beautifully executed portraits of bison, deer, salmon and other animals in the caves of France by the hunter-gatherer ancestors of modern day Europeans. Humans worldwide lived in tribal, hunter-gatherer societies for most of their evolutionary history, and some anthropologists argue that we therefore feel most at ease in circumstances that mimic such societies. These circumstances include open settings with views of wildlife or livestock as substitutes for wildlife , living in areas near water, and egalitarian social groups with frequent interactions with close family members and at most a few dozen members of the same culture Wilson , Richerson and Boyd Influences on natural ecosystems and wildlife Overall, hunter-gatherer societies are generally regarded as the best of all types of societies at coexisting with natural wildlife populations, because human population densities tend to be low and because this way of getting food involves the least manipulation of natural ecosystems. The much greater abundance and diversity of wildlife in North America as opposed to Europe at the time of European colonization, in spite of the roughly equal latitudes and areas of these continents, speaks directly to the relatively greater ability of hunter-gatherer societies to coexist with wildlife. It has been suggested that the ability of hunter-gatherer societies to coexist with wildlife is attributable to their magical, reverent attitude toward nature Gottleib However, alternative arguments assert that hunter-gathers had relatively small impacts on natural ecosystems simply because they did not have the technologies to further manipulate nature, or the population densities that require such manipulations Wilber It is known that the hunter-gathers of Asia, Australia, and North America caused the extinction of numerous large mammal and bird species by over hunting and altering the landscape through extensive use of fire, which suggests that even humans living in hunter-gatherer societies can have considerable ecological influence Flannery , , Warren This is discussed in more detail in the next chapter. They may supplement the food they raise with hunting and foraging. Those early agrarian societies that focus on planting are called horticultural societies, whereas those that focus on livestock as the primary food source are called herding or pastoralist societies Richerson et al. There can be considerable differences between these two types of societies, but we have grouped them both under early agrarian society for this discussion. Early agrarian societies are distinguished from late agrarian societies by the lack of metal plows, and beasts of burden to pull them. Most early agrarian societies have domesticated animals, although the indigenous civilizations of North and Central America and Australia kept only dogs. Many wet tropical areas of the world still support horticulturalist societies that practice small-scale slash and burn agriculture. The poor soil of such regions usually cannot support the permanent, large-scale, plowed farming style of more advanced agriculture societies. The greater efficiency and predictability of agricultural practices for obtaining food means that such societies generally have higher population densities than hunter-gatherer societies Richerson et al. Permanent villages and small cities usually first occur in agricultural societies. The greater productivity of agriculture can support a more complex social structure with greater division of labor, because not everyone needs to work to procure food. This can result in the development of a ruling class, a religious class, and artisans, which further accelerates cultural evolution. This division of labor means that early agrarian societies often are less egalitarian than hunter-gatherer societies. The few human societies that are matrilineal, i. In these societies, the stationary settlements and relatively easy physical labor needed to procure food allow women to contribute greatly to the food supply, and their status and economic power is greater as a result. Beliefs and attitudes toward nature and wildlife The gods and goddesses of early agrarian societies begin to take on a human face

rather than animal face, compared to those of hunter-gatherer societies. Encountering a particular species of wildlife may be construed as an omen from a god, but the power usually does not reside in the animal itself, but rather in its relationship to a deity. Animals often play important roles in the mythology of such cultures, and gods themselves may take the forms of animals. The "pagan" religions of Northern Europe are one Western example of an early agrarian religion. The mythology of the classical Greek gods and goddesses is also an example of these themes, although ancient Greek society itself was too technologically advanced to be properly categorized as early agrarian. A common religious theme in early agrarian cultures was the need to makes sacrifices to gods to incur their favor and ensure continued bounty Wilber In herding societies these were usually animal sacrifices, and the Old Testament actually gives instructions of how to perform these. However, in horticultural societies human sacrifice was surprisingly common. Some of the early agrarian cultures of Europe and the Middle East practiced human sacrifice, as did the Aztecs and Ohio Valley horticulturalists of the New World Richerson , Wilber , Warren Influences on natural ecosystems and wildlife Because their mode of procuring food involves manipulation of natural ecosystems, early agrarian societies tend to have greater negative impacts on wildlife. Areas used to tend desired crops are not available to support the full species complement of the surrounding natural plant community, and livestock often compete with other animal species for forage. Denser human settlements may over-exploit wildlife in the surrounding wild areas, even if they are not directly manipulating the habitat. However, horticultural and herding societies are generally confined to only certain climates and habitat types, and their population densities are still relatively low, so often with these societies there are still considerable undisturbed areas that provide habitat for wildlife. Increased birth rates are commonly observed when people transition from hunter-gatherer to early agrarian societies, and the denser, growing human populations place ever-increasing demands on the surrounding wildlife and natural ecosystems.

TOWARD A NATURAL HISTORY OF THE PRESENT pdf

2: Francis Bacon: Preparative toward a Natural and Experimental History ()

This item: An Essay Towards a History of Hexham Illustrating Its Ancient and Its Present State, Civil and Ecclesiastical Economy, Antiquities and and Natural History of the Neighbourhood Illustrating Its Ancient and Its Present State, Civil and Ecclesiastical Economy, Antiquities and and Natural History of the Neighbourhood.

A similar reason induces me to subjoin here another small portion of the work, and to publish it along with that which has just been set forth. This is the description and delineation of a natural and experimental history, such as may serve to build philosophy upon, and containing material true and copious and aptly digested for the work of the interpreter which follows. The proper place for it would be when I come in due course to the "Preparatives" of Inquiry. I have thought it better, however, to introduce it at once without waiting for that. For a history of this kind, such as I conceive and shall presently describe, is a thing of very great size and cannot be executed without great labor and expense, requiring as it does many people to help, and being as I have said elsewhere a kind of royal work. It occurs to me, therefore, that it may not be amiss to try if there be any others who will take these matters in hand, so that while I go on with the completion of my original design, this part which is so manifold and laborious may even during my life if it so please the Divine Majesty be prepared and set forth, others applying themselves diligently to it along with me; the rather because my own strength if I should have no one to help me is hardly equal to such a province. For as much relates to the work itself of the intellect, I shall perhaps be able to master that by myself; but the materials on which the intellect has to work are so widely spread that one must employ factors and merchants to go everywhere in search of them and bring them in. That, however, which is the main part of the matter I will myself now supply, by diligently and exactly setting forth the method and description of a history of this kind, such as shall satisfy my intention; lest men for want of warning set to work the wrong way and guide themselves by the example of the natural histories now in use, and so go far astray from my design. Meanwhile, what I have often said I must here emphatically repeat: Whereas, on the other hand, let such a history be once provided and well set forth, and let there be added to it such auxiliary and light-giving experiments as in the very course of interpretation will present themselves or will have to be found out, and the investigation of nature and of all sciences will be the work of a few years. This, therefore, must be done or the business must be given up. For in this way, and in this way only, can the foundations of a true and active philosophy be established; and then will men wake as from deep sleep, and at once perceive what a difference there is between the dogmas and figments of the wit and a true and active philosophy, and what it is in questions of nature to consult nature herself. Either she is free and develops herself in her own ordinary course, or she is forced out of her proper state by the perverseness and insubordination of matter and the violence of impediments, or she is constrained and molded by art and human ministry. The first state refers to the "species" of things; the second to "monsters"; the third to "things artificial. But by the help and ministry of man a new face of bodies, another universe or theater of things, comes into view. Natural history therefore is threefold. It treats of the "liberty" of nature, or the "errors" of nature, or the "bonds" of nature, so that we may fairly distribute it into history of "generations," of "pretergenerations," and of "arts"; which last I also call "mechanical" or "experimental" history. And yet I do not make it a rule that these three should be kept apart and separately treated. For why should not the history of the monsters in the several species be joined with the history of the species themselves? And things artificial again may sometimes be rightly joined with the species, though sometimes they will be better kept separate. It will be best, therefore, to consider these things as the case arises. For too much method produces iterations and prolixity as well as none at all. II Natural history, which in its subject as I said is threefold, is in its use twofold. For it is used either for the sake of the knowledge of the particular things which it contains or as the primary material of philosophy and the stuff and subject matter of true induction. And it is this latter which is now in hand â€” now, I say, for the first time; nor has it even been taken in hand till now. For neither Aristotle, nor Theophrastus, nor Dioscorides, nor Gaius Plinius ever set this before them as the end of natural history. And the chief part of the matter rests in this, that they who shall hereafter take it upon them to write natural history should bear this continually in mind â€” that they ought not

to consult the pleasure of the reader, no, nor even that utility which may be derived immediately from their narrations, but to seek out and gather together such store and variety of things as may suffice for the formation of true axioms. Let them but remember this, and they will find out for themselves the method in which the history should be composed. For the end rules the method. III But the more difficult and laborious the work is, the more ought it to be discharged of matters superfluous. And therefore there are three things upon which men should be warned to be sparing of their labor, as those which will immensely increase the mass of the work and add little or nothing to its worth. First then, away with antiquities, and citations or testimonies of authors, and also with disputes and controversies and differing opinions â€" everything, in short, which is philological. Never cite an author except in a matter of doubtful credit; never introduce a controversy unless in a matter of great moment. And for all that concerns ornaments of speech, similitudes, treasury of eloquence, and such like emptinesses, let it be utterly dismissed. Also let all those things which are admitted be themselves set down briefly and concisely, so that they may be nothing less than words. For no man who is collecting and storing up materials for ship building or the like, thinks of arranging them elegantly, as in a shop, and displaying them so as to please the eye; all his care is that they be sound and good, and that they be so arranged as to take up as little room as possible in the warehouse. And this is exactly what should be done here. Secondly, that superfluity of natural histories in descriptions and pictures of species, and the curious variety of the same, is not much to the purpose. For small varieties of this kind are only a kind of sports and wanton freaks of nature and come near to the nature of individuals. They afford a pleasant recreation in wandering among them and looking at them as objects in themselves, but the information they yield to the sciences is slight and almost superfluous. Thirdly, all superstitious stories I do not say stories of prodigies, when the report appears to be faithful and probable, but superstitious stories and experiments of ceremonial magic should be altogether rejected. The time will perhaps come after we have gone somewhat deeper into the investigation of nature for a light review of things of this kind, that if there remain any grains of natural virtue in these dregs, they may be extracted and laid up for use. In the meantime they should be set aside. Even the experiments of natural magic should be sifted diligently and severely before they are received, especially those which are commonly derived from vulgar sympathies and antipathies, with great sloth and facility both of believing and inventing. And it is no small thing to relieve natural history from the three superfluities above mentioned, which would otherwise fill volumes. Nor is this all. For in a great work it is no less necessary that what is admitted should be written succinctly than that what is superfluous should be rejected, though no doubt this kind of chastity and brevity will give less pleasure both to the reader and the writer. But it is always to be remembered that this which we are now about is only a granary and storehouse of matters, not meant to be pleasant to stay or live in, but only to be entered as occasion requires, when anything is wanted for the work of the interpreter which follows. IV In the history which I require and design, special care is to be taken that it be of wide range and made to the measure of the universe. For the world is not to be narrowed till it will go into the understanding which has been done hitherto , but the understanding to be expanded and opened till it can take in the image of the world as it is in fact. For that fashion of taking few things into account, and pronouncing with reference to a few things, has been the ruin of everything. To resume then the divisions of natural history which I made just now â€" viz. The first, of ether and things celestial. The second, of meteors and the regions as they call them of air, viz. The third, of earth and sea. The fourth, of the elements as they call them , flame or fire, air, water, earth, understanding, however, by elements, not the first principles of things, but the greater masses of natural bodies. For the nature of things is so distributed that the quantity or mass of some bodies in the universe is very great, because their configurations require a texture of matter easy and obvious, such as are those four bodies which I have mentioned; while of certain other bodies the quantity is small and weakly supplied, because the texture of matter which they require is very complex and subtle, and for the most part determinate and organic, such as are the species of natural things â€" metals, plants, animals. Hence I call the former kind of bodies the "greater colleges," the latter the "lesser colleges. And let it not be thought that I confound this fourth part with the second and third, because in each of them I have mentioned air, water, and earth. For the history of these enters into the second and third, as they are integral parts of the world, and as they relate to the fabric and configuration of the universe. But in the fourth is contained the

history of their own substance and nature, as it exists in their several parts of uniform structure, and without reference to the whole. Lastly, the fifth part of the history contains the lesser colleges, or species, upon which natural history has hitherto been principally employed. As for the history of pretergenerations, I have already said that it may be most conveniently joined with the history of generations â€" I mean the history of prodigies which are natural. For the superstitious history of marvels of whatever kind I remit to a quite separate treatise of its own; which treatise I do not wish to be undertaken now at first, but a little after, when the investigation of nature has been carried deeper. History of arts, and of nature as changed and altered by man, or experimental history, I divide into three. For it is drawn either from mechanical arts, or from the operative part of the liberal arts, or from a number of crafts and experiments which have not yet grown into an art properly so called, and which sometimes indeed turn up in the course of most ordinary experience and do not stand at all in need of art. As soon, therefore, as a history has been completed of all these things which I have mentioned â€" namely, generations, pretergenerations, arts, and experiments, it seems that nothing will remain unprovided whereby the sense can be equipped for information of the understanding. And then shall we be no longer kept dancing within little rings, like persons bewitched, but our range and circuit will be as wide as the compass of the world. V Among the parts of history which I have mentioned, the history of arts is of most use because it exhibits things in motion and leads more directly to practice. Moreover, it takes off the mask and veil from natural objects, which are commonly concealed and obscured under the variety of shapes and external appearance. Finally, the vexations of art are certainly as the bonds and handcuffs of Proteus, which betray the ultimate struggles and efforts of matter. For bodies will not be destroyed or annihilated, rather than that they will turn themselves into various forms. Upon this history, therefore, mechanical and illiberal as it may seem all fineness and daintiness set aside , the greatest diligence must be bestowed. Again, among the particular arts those are to be preferred which exhibit, alter, and prepare natural bodies and materials of things, such as agriculture, cookery, chemistry, dyeing, the manufacture of glass, enamel, sugar, gunpowder, artificial fires, paper, and the like. Those which consist principally in the subtle motion of the hands or instruments are of less use, such as weaving, carpentry, architecture, manufacture of mills, clocks, and the like, although these too are by no means to be neglected, both because many things occur in them which relate to the alterations of natural bodies, and because they give accurate information concerning local motion, which is a thing of great importance in very many respects. But in the whole collection of this history of arts it is especially to be observed and constantly borne in mind that not only those experiments in each art which serve the purpose of the art itself are to be received, but likewise those which turn up anyhow by the way. For example, that locusts or crabs, which were before of the color of mud, turn red when baked is nothing to the table; but this very instance is not a bad one for investigating the nature of redness, seeing that the same thing happens in baked bricks. In like manner the fact that meat is sooner salted in winter than in summer is not only important for the cook that he may know how to regulate the pickling, but is likewise a good instance for showing the nature and impression of cold. Therefore, it would be an utter mistake to suppose that my intention would be satisfied by a collection of experiments of arts made only with the view of thereby bringing the several arts to greater perfection. For though this be an object which in many cases I do not despise, yet my meaning plainly is that all mechanical experiments should be as streams flowing from all sides into the sea of philosophy. But how to select the more important instances in every kind which are principally and with the greatest diligence to be sought and as it were hunted out is a point to be learned from the prerogatives of instances. For the things which will be set forth in this history are not collected as I have already said on their own account; and therefore neither is their importance to be measured by what they are worth in themselves, but according to their indirect bearing upon other things and the influence they may have upon philosophy. VII Another precept is that everything relating both to bodies and virtues in nature be set forth as far as may be numbered, weighed, measured, defined. For it is works we are in pursuit of, not speculations; and practical working comes of the due combination of physics and mathematics. And therefore the exact revolutions and distances of the planets â€" in the history of the heavenly bodies; the compass of the land and the superficial space it occupies in comparison of the waters â€" in the history of earth and sea; how much compression air will bear without strong resistance â€" in the history of air; how much one metal outweighs another â€" in the history of

metals; and numberless other particulars of that kind are to be ascertained and set down. And when exact proportions cannot be obtained, then we must have recourse to indefinite estimates and comparatives. As for instance if we happen to distrust the calculations of astronomers as to the distances of the planets , that the moon is within the shadow of the earth, that Mercury is beyond the moon, and the like. Also when mean proportions cannot be had, let extremes be proposed, as that a weak magnet will raise so many times its own weight of iron, while the most powerful will raise sixty times its own weight as I have myself seen in the case of a very small armed magnet. I know well enough that these definite instances do not occur readily or often, but that they must be sought for as auxiliaries in the course of interpretation itself when they are most wanted. But nevertheless if they present themselves accidentally, provided they do not too much interrupt the progress of the natural history, they should also be entered therein. VIII With regard to the credit of the things which are to be admitted into the history, they must needs be either certainly true, doubtful whether true or not, or certainly not true. Things of the first kind should be set down simply; things of the second kind with a qualifying note, such as "it is reported," "they relate," "I have heard from a person of credit," and the like. For to add the arguments on either side would be too laborious and would certainly interrupt the writer too much. Nor is it of much consequence to the business in hand because as I have said in the th aphorism of the first book mistakes in experimenting, unless they abound everywhere, will be presently detected and corrected by the truth of axioms. And it is manifest that this is so, because the new root is always found to be solid and succulent, the old withered and spongy. And therefore it is no marvel if one sinks in water and the other swims â€” which nevertheless goes for a wonder and has added credit to the other virtues ascribed to this herb. IX There are also some things which may be usefully added to the natural history, and which will make it fitter and more convenient for the work of the interpreter, which follows. Thirdly, if in any statement there be anything doubtful or questionable, I would by no means have it suppressed or passed in silence, but plainly and perspicuously set down by way of note or admonition. Fourthly, it would not be amiss to intersperse observations occasionally, as Pliny has done; as in the history of earth and sea, that the figure of the earth as far as it is yet known compared with the seas is narrow and pointed toward the south, wide and broad toward the north, the figure of the sea contrary; that the great oceans intersect the earth in channels running north and south, not east and west, except perhaps in the extreme polar regions.

TOWARD A NATURAL HISTORY OF THE PRESENT pdf

3: A brief history of the relationship between humans and wildlife - www.enganchecubano.com

Excerpt from An Essay Towards a Natural History of the Earth, and Terrestrial Bodyes, Especially Minerals: As Also of the Sea, Rivers, and Springs; With an Account of the Universal Deluge, and of the Effects That It Had Upon the Earth.

This article has been cited by other articles in PMC. Abstract Darwin is the father of evolutionary theory because he identified evolutionary patterns and, with Natural Selection, he ascertained the exquisitely ecological ultimate processes that lead to evolution. The proximate processes of evolution he proposed, however, predated the discovery of genetics, the backbone of modern evolutionary theory. The later discovery of the laws of inheritance by Mendel and the rediscovery of Mendel in the early 20th century led to two reforms of Darwinism: Neo-Darwinism and the Modern Synthesis and subsequent refinements. The Origin contains a high proportion of currently accepted ecological principles. Darwin labelled himself a naturalist. His discipline natural history was a blend of ecology and evolution in which he investigated both the patterns and the processes that determine the organization of life. Introduction With The Origin of Species [1], universally considered the founding book of the theory of evolution, Darwin recognized a pattern already identified by other scientists. The Origin contains a myriad of apparently collateral sentences and observations that in many cases contain the seeds of many ecological principles that later were formalized by various authors who were often given the merit of their proposal. These ideas might have been developed with no influence from Darwin, as happened when Darwin and Wallace independently discovered Natural Selection [3] and when many other scientists, in many fields of science, independently reached the same conclusions. However, in some cases, the proponents of these ideas might have read The Origin of Species as an evolution book, the ecology in it remaining buried in the back of their minds, as the seed is buried in the soil. Analyzing the text, I will argue that the Origin is a book of both ecology and evolution and that it blends the two disciplines, being the founding book of the Theory of Natural History, as Darwin defined his discipline. Materials and methods In his famous film Rashomon, Akira Kurosawa showed that an event here, a book can be seen and described in many ways, according to the point of view of the witnesses. I ordered them so as to form a conceptual quilt that shows the beginning of modern ecology in an evolutionary framework. Citations from The Origin of Species were extracted from searchable versions available on the internet. Paginations vary in different files of the same text; hence, the exact pages of the original printed version s are not reported: Reznick [4] wrote a useful guide to a modern reading of the Origin. Results After a general analysis of the first edition of the Origin, the rest of the results lists the main ecological ideas sketched in the book. The order is usually that of appearance in the book but, for ease of comparison, the treatments of plot experiments, coming from different chapters, are merged. Furthermore, Darwin proposed Natural Selection as the ultimate process of evolution, i. Nature selects suitable characters from the array of traits that are expressed by a species variability , and only the features that pass the examination of the great scrutinizer survive. Darwin also recognized that advantages in the obtainment of resources must be followed by reproductive success, hence sexual selection with the exception of uniparental species. Darwin also provided proximate explanations about the origin of natural variability, but the work of Mendel was unknown to him: Darwin reformed When Weismann proposed the theory of the germ plasm, postulating the separation of the germ from the somatic line, Lamarckian explanations of the proximate mechanisms of evolution were rejected: The germ line is devoted to passing information from one generation to the next and is separated from the somatic line. The germ line does not acquire new features that the soma might gain during the life of an individual. The pattern evolution remained valid, but the proximate processes leading to it were modified. These views of development, though, were narrowed by the reductionistic approaches of Wilhelm Roux, who proposed developmental mechanics Entwicklungsmechanik , and by Hans Driesch. They went to the cellular roots of development and did not consider Darwinian evolution to be a causal agent. Thus, at the beginning of the last century, biology became reductionistic, started to divorce from natural history, and budded off many branches from genetics and embryology to ecology that went through almost autonomous developments. Elton [7] posed the basis of modern ecology in a seminal book Animal Ecology that started with these sentences: It

simply means scientific natural history. Darwin defined himself as a naturalist. Knowing animals and plants i. In the Thirties and Forties, the importance of Darwinian thinking was reassessed by a group of biologists who wrote a series of seminal books that together formed the Modern Evolutionary Synthesis [6], assembling two main approaches: These approaches considered species and populations to be discrete entities but disregarded the interactions among species in ecological time. A Darwinian paradox The scientific community concentrated on the proximate causes of evolution that Darwin missed, developing new disciplines such as molecular genetics, fostered by the invention of powerful instruments to analyze genetic materials. The ecologists and the embryologists had the possibility of contributing further to the identification of the ultimate causes of evolution but made scant attempts at reconciling their disciplines with evolutionary thinking: Each approach is pursued by well-trained and competent scientists who, eager to know their topics perfectly, do not have time to look outside their specific field of expertise. This resulted in increasingly refined analyses of proximate and mechanistic causes of evolution in all their facets, from molecules to ecosystems, but the pieces of the puzzle are still mostly disconnected. Only recently, with the proposal of evo-devo, or embryology energized with molecular developmental biology, have we started to consider the solution of major evolutionary problems, such as the origin of eyes [10]. Evo-devo, however, considers the genetic causes of the evolution of both organs and individuals to be ontogenetic products, disregarding the bearing of the environment on evolution. In very recent years, owing to this bad name, some eminent scholars, such as Ricklefs [11] and Tewksbury et al. Ricklefs [11], p. Physics is the most mathematized approach to the study of nature, and philosophers of science often use it as a paradigm of what science is or should be. This sparked so-called physics envy in other disciplines [14]: This envy was enhanced by labeling mathematized sciences as hard and predictive, whereas low-mathematization sciences were labeled as soft and descriptive. Nowadays, we know, with both quantum physics and the indetermination principle, that even these laws are not universal; in spite of this, they can be used operationally since they are accurate enough to allow, for instance, the sending of rockets to Mars. Darwin realized that the life sciences are more complex than physics and that they are historical. He thus introduced history in the system, showing that the present is the product of history. And the product of evolution, in this case, is not a species but instead a species assemblage: With the handful-of-feathers metaphor, Darwin illustrates the difference between ahistorical and nomothetic disciplines tackling simple problems vs historical and idiographic ones tackling difficult problems [15]. Attracted by the Malthusian reasoning about population sizes in relation to the resources sustaining them, Darwin used mathematics to search for some evidence about the limits of population growth: The way he describes the exercise it caused him pain shows that he did not at all like to use his brain for searching evidence in numbers written on paper. He thus liquidates the issue with: These sentences, and the handful of feathers metaphor, reveal that Darwin considered the hard-to-be sciences to be the sciences of simplicity, tackling easy problems, whereas the soft-to-be sciences are the difficult ones. This position was not embraced by Darwin followers, who in general became strongly affected by physics envy [14] and considered natural history to be a non-scientific discipline. Some physicists, however, feel the urge of merging the so-called Newtonian worldview with the Darwinian one [16], even though this reconciliation is hindered by the historical nature of ecology and evolution: The theory of ecology Theoretical ecology is usually conceived as a highly mathematized discipline, in which relationships among the different actors are accounted for in models that might even lead to predictions. Physics envy led ecologists to search for laws that might allow one to predict the future in a deterministic way. How many species are there on Earth? A model is relevant if it considers the relevant variables, and species are the most relevant variables when nature is considered. Ecological theory was developed with computers, with mathematical models and simulations, or in experimental settings [19], sometimes in bottles like those of [20] , sometimes in micro- and mesocosms, or in the field, but only where conditions are conducive to manipulation e. The number of variables especially species was kept to a minimum since the calculations and the manipulations are difficult when the interactors and the interactions are many as happens in the real world. It is suggestive that Loreau [21], in a review aimed at founding a new synthetic theory of ecology, points out that the two main experiments aimed at linking biodiversity with ecosystem functioning dealt with 16 and 32 species, respectively. From various estimates, biodiversity is made

of more than 10 million species! Obviously, these millions of species do not occur all in one place, but it is nonetheless suggestive that low-diversity communities are taken as a paradigm for the relationship between biodiversity and ecosystem functioning. Boero and Fresi [22], for instance, reported 90 species of hydroids on a vertical rocky cliff in the Mediterranean Sea, the whole biota of that single spot probably comprising several hundred species of macroscopic organisms. Similar numbers are reported by Terlizzi et al. Evidently, our planet is inhabited by many more species than hard theoretical ecology can handle. This must be taken into account if we want to understand what is happening out there and not only what is happening in a computer or in limited experiments. The entangled bank A theory is based on the concepts that form its pillars. Community, or biocenosis, is surely a key ecological concept. In The Origin of Species, however, Darwin describes rather clearly a biological community, using the tangled bank as a metaphor: But how false a view is this! The entangled bank is not a product of chance; it is a well-defined entity deriving from the interactions among all the actors that play a role in it. Communities interact with the physical factors, so as to form ecosystems. In fact, later in the book, Darwin introduces the physical factors, envisaging what was later called an ecosystem: In certain parts of the Origin, Darwin disregarded physical conditions and stressed biotic interactions, namely competition and predation, whereas in other parts he recognised the importance of both biotic and abiotic drivers. Darwin as a naturalist or natural historian? The sentence above, furthermore, depicts a food web, with the subtle trophic interactions that link species. Darwin labeled himself a naturalist, as indicated by the title of the book describing his voyage with the Beagle. Natural history is the discipline of naturalists who indeed might have been less equivocally identified as natural historians. Historians, in fact, study human history, whereas naturalists study the history of nature. It is crucial, at this point, to appreciate the difference between historical and ahistorical sciences, as explained by Mayr [25]. With chaos theory, mathematicians formalised this difference, providing evidence for the inherent unpredictability of complex systems. In this framework, in fact, a complex system should be very sensitive to slight changes in the initial conditions that determine its future behaviour. Chaos theory provides a very useful concept that buffers the hopeless task in of predicting the future: Chaos theory was instrumental in justifying failures in predicting the weather over the medium to long term: The attractor might be equalled to the definite laws of physics; it is a constraint that forces the system to behave in a certain way. Once laws are detected and formalised into a formula, it is possible, knowing the initial conditions, to predict the outcome of the behaviour of the system. These diversions from the expected outcome of the interactions among the components of the systems are often called contingencies and their effects cannot be predicted. In the absence of contingencies, the attractors have total influence over the behaviour of a system which then behaves in a completely predictable fashion. Without contingencies, the future is similar to the past and events occur over and over again or change according to a definite path that can be inferred by the application of the laws. This is obviously a system devoid of history. History, in fact, is the deviation from the norm, is the contingency that pushes the system into a different orbit, sparking new conditions that will lead to unexpected outcomes. We can predict the orbits of the planets, and the behaviour of electrons and molecules, because these systems occur at scales that are either too large or too small for our scale of perception. The laws continue to act, but since they are too many and have only limited application, contingencies can be more powerful than the laws.

TOWARD A NATURAL HISTORY OF THE PRESENT pdf

4: CiteSeerX â€” _____ _ _____ Towards A Critical Natural History

An essay towards a natural history of the earth, and terrestrial bodies, especially minerals: as also of the sea, rivers, and springs. With an account of the universal deluge: and of the effects that it had upon the earth.

Frederick Jackson Turner â€” In the United States the American Society for Environmental History was founded in while the first institute devoted specifically to environmental history in Europe was established in , based at the University of St. In , the Dutch foundation for the history of environment and hygiene Net Werk was founded and publishes four newsletters per year. In the UK the White Horse Press in Cambridge has, since , published the journal Environment and History which aims to bring scholars in the humanities and biological sciences closer together in constructing long and well-founded perspectives on present day environmental problems and a similar publication Tijdschrift voor Ecologische Geschiedenis Journal for Environmental History is a combined Flemish-Dutch initiative mainly dealing with topics in the Netherlands and Belgium although it also has an interest in European environmental history. Each issue contains abstracts in English, French and German. In the Journal was converted into a yearbook for environmental history. In Canada the Network in Canadian History and Environment facilitates the growth of environmental history through numerous workshops and a significant digital infrastructure including their website and podcast. In April a meeting was held in Germany to overcome these problems and to co-ordinate environmental history in Europe. This meeting resulted in the creation of the European Society for Environmental History in Around scholars attended the meeting and papers were presented on topics covering the whole spectrum of environmental history. The conference showed that environmental history is a viable and lively field in Europe and since then ESEH has expanded to over members and continues to grow and attracted international conferences in and Construction was plagued by problems, including disease particularly malaria and yellow fever and landslides. By the time the canal was completed, a total of 27, French and American workmen are estimated to have died. Environmental history prides itself in bridging the gap between the arts and natural sciences although to date the scales weigh on the side of science. A definitive list of related subjects would be lengthy indeed and singling out those for special mention a difficult task. However, those frequently quoted include, historical geography , the history and philosophy of science , history of technology and climate science. On the biological side there is, above all, ecology and historical ecology , but also forestry and especially forest history , archaeology and anthropology. When the subject engages in environmental advocacy it has much in common with environmentalism. With increasing globalization and the impact of global trade on resource distribution, concern over never-ending economic growth and the many human inequities environmental history is now gaining allies in the fields of ecological and environmental economics. This has been seen as the reason for a perceived lack of support from traditional historians. These include discussion concerning: For Paul Warde the sheer scale, scope and diffuseness of the environmental history endeavour calls for an analytical toolkit "a range of common issues and questions to push forward collectively" and a "core problem". He sees a lack of "human agency" in its texts and suggest it be written more to act: Sustainability Many of the themes of environmental history inevitably examine the circumstances that produced the environmental problems of the present day, a litany of themes that challenge global sustainability including: Richard Grove has pointed out that "States will act to prevent environmental degradation only when their economic interests are threatened". Advocacy It is not clear whether environmental history should promote a moral or political agenda. The strong emotions raised by environmentalism, conservation and sustainability can interfere with historical objectivity: Engagement with the political process certainly has its academic perils [53] although accuracy and commitment to the historical method is not necessarily threatened by environmental involvement: Imbalances of power in resources, industry, and politics have resulted in the burden of industrial pollution being shifted to less powerful populations in both the geographic and social spheres. Communities with less economic and sociopolitical power often lack the resources to get involved in environmental advocacy. Environmental history increasingly highlights the ways in which the middle-class environmental movement has fallen short and left behind entire

communities. Interdisciplinary research now understands historic inequality as a lens through which to predict future social developments in the environmental sphere, particularly with regard to climate change. The United Nations Department of Economic and Social Affairs cautions that a warming planet will exacerbate environmental and other inequalities, particularly with regard to: Declensionist narratives[edit] Narratives of environmental history tend to be declensionist, that is, accounts of progressive decline under human activity. Presentism literary and historical analysis Under the accusation of "presentism" it is sometimes claimed that, with its genesis in the late 20th century environmentalism and conservation issues, environmental history is simply a reaction to contemporary problems, an "attempt to read late twentieth century developments and concerns back into past historical periods in which they were not operative, and certainly not conscious to human participants during those times". In environmental debate blame can always be apportioned, but it is more constructive for the future to understand the values and imperatives of the period under discussion so that causes are determined and the context explained. Environmental determinism and Cultural determinism Ploughing farmer in ancient Egypt. Mural in the burial chamber of artisan Sennedjem c. The claim that the path of history has been forged by environmental rather than cultural forces is referred to as environmental determinism while, at the other extreme, is what may be called cultural determinism. An example of cultural determinism would be the view that human influence is so pervasive that the idea of pristine nature has little validity - that there is no way of relating to nature without culture. Historical method Recording historical events Useful guidance on the process of doing environmental history has been given by Donald Worster, [63] Carolyn Merchant, [64] William Cronon [65] and Ian Simmons. The tools are those of both history and science with a requirement for fluency in the language of natural science and especially ecology. Shikar, Subsistence, Sustenance and the Sciences Kolkata: Readers Service, Chakrabarti, Ranjan ed. Manohar, Cronon, William ed , Uncommon Ground: Toward Reinventing Nature New York: The Environmental History of Settler Societies. Cambridge University Press, Hughes, J. Routledge, Hughes, J. The Long View", Globalizations, Vol. The Decline of Nature: The Global Environmental Movement. Forestry and Imperial Eco-Development, Oxford: The MIT Press, Williams, Michael , Deforesting the Earth: From Prehistory to Global Crisis. The Remaking of the Columbia River. A Study of Ecological Ideals. Donald Hughes has also provided a global conspectus of major contributions to the environmental history literature. David Lowenthal Cambridge, MA: Lesotho Adams, Jonathan S. Conservation without Illusion Berkeley: Journal of Historical Geography. Histories, Ecologies, and Societies," Environment and History, 10 , pp. Cases and Comparisons Athens: A South African History Cambridge: Sharing the Approach and the Experience New York: An Environmental History of Africa, Portsmouth: Heinemann, Showers, Kate B. Soil Erosion and Conservation in Lesotho pp Steyn, Phia, "The lingering environmental impact of repressive governance: A Journey to Antarctica. University of Iowa Press, North and South America[edit] Further information: Forests, Conservation, and Community in Mexico. Duke University Press A postcolonial environmental history of the Papaloapan Projects in Mexico. University of Florida With Broadax and Firebrand: The Destruction of the Brazilian Atlantic Forest. University of California Press, Dorsey, Kurkpatrick. The Dawn of Conservation Diplomacy: From Rainforest to Cane Field in Cuba: An Environmental History since Authority, Expertise, and Power in Mexican Forests. Massachusetts Institute of Technology Press, A Plague of Sheep: Environmental Consequences of the Conquest of Mexico. An Environmental History of Latin America. Stanford University Press Noss, Andrew and Imke Oetting. Raffles, Hugh, et al. Transformations of Rivers and Streams". Latin American Research Review. The Ecology of Oil: Environment, Labor, and the Mexican Revolution, Cambridge University Press Defending the Land of the Jaguar: A History of Conservation in Mexico. University of Texas Press, Wakild, Emily. University of Arizona Press

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John Tallmadge, "Toward a Natural History of Reading," ISLE (Winter), Â©ASLE 3 might see themselves and their works as furthering such a process.

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