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To “curate”, in the modern vernacular, is to select and design a collection from a larger set. In a world where people have access to too much of nearly everything—things, experiences, information, and people—curating has emerged as a core skill to succeed in life.

In a way, we are all curating whether we realize it or not. When we furnish a house, we select specific artifacts from a vast number of potential options, and arrange them in a way that enables particular form and function. When we speak or write, we select words from an ever-burgeoning lexicon and order them in a way that produces a particular narrative. When we spend time during the day, we pick our activities from a virtually limitless set of possible choices according to a design of our choosing, and call it a day. The company we keep is the small subset of people with whom we have chosen to interact out of the 6 billion other humans with whom we share this planet.

How we select and design our experiences are choices based on our priorities, intentions, taste, experience, skill, and access. Our process is cultivated through both school and real world experiences. In some cases, such as with words we speak every day, we are curating constantly. In other cases, such as when selecting the layout of our office desks, curating happens passively, if at all. When it comes to building a catalogue of Facebook friends, we end up with a mix of those whom we select and those who select us.

Selecting and designing are separately important skills. For instance, when building a company, it is partly the people you hire and partly

how you organize them that determines the success of the team.

If you are particularly adept at curating in a particular domain, there is a chance someone will pay you for that privilege. If you are good at selecting words and putting them together in a certain order, you might be called a writer or a poet or maybe a comedian. If you are good at selecting stocks and putting them in certain proportions relative to each other in a way that maximizes potential return per potential risk, you might be called a portfolio manager.

Whether for ourselves (personal) or for others (professional), we can all aim to improve our abilities to curate. These days, there is too much of too many things, so being selective can improve overall outcomes. The low cost of technology and transportation connects us to more options than were ever available to our predecessors. As a result, folks are drifting towards having too many relationships of lower quality—too many acquaintances in their personal lives and work schedules cluttered with an endless series of dubious meetings. Not being selective with relationships is akin to buying an index fund of stocks. You are taking in everything under the sun without much discrimination, so your outcome is likely to be average. Fewer, higher-quality relationships can improve your personal life; fewer, higher-value meetings can improve your professional performances; fewer, higher-grade investments can enhance your wealth.

Was caffeine the fuel that enlightened the European Age of Reason (17th–18th centuries) after the alcohol-fueled haze of the Dark Ages? Christopher Columbus' 1502 encounter with a Mayan trading canoe in the New World led to the introduction of cocoa into Europe on a large scale. Tea arrived through Portugal, and coffee through Italy, in mass scales later in the century. The coffee bean, tea leaf, cocoa bean, and kola nut are naturally bitter, but the lure of their psychoactive properties encouraged their recombination with fat (often milk) and sugar to render more palatable foods and drinks such as coffee and chocolate. To trace the introduction of psycho-stimulants such as coffee, tea, cocoa, and sugar into Europeans is to trace the history of colonialism and imperialism. I don't remember this being mentioned in history class.

Without the six pots of coffee a day that filled his mental tank, would the world today still remember Voltaire (1694–1778), a key figure of the French Enlightenment who anchored the greater European Enlightenment?

Further reflection on the subject may be warranted, perhaps with a Diet Coke in hand.

Ethylene:
the Most Important Molecule
You've Never Heard Of?

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Ethylene is a gaseous hydrocarbon with the molecular structure C_2H_4 . It is commonly produced when hydrocarbons are exposed to oxidative stress, such as that found during lightening, volcanic eruptions, forest fires, and photochemical reactions on the ocean surface. Plants coopted ethylene biosynthesis during evolution to manage their response to oxidative stress from biotic and abiotic sources. Further exaptations of ethylene include modulation of plant life history events such as development, transformation, senescence and death.

Due to a number of factors described below, humans may be subject to increasing ethylene exposure. The potential health consequences of ethylene exposure are not part of the public consciousness and warrant further exploration.

Ethylene In Nature

- Ethylene is produced when hydrocarbons are exposed to oxidative stress. Examples include photochemical reactions in various environments such as the atmosphere, ocean surface, and volcanoes. It is also produced in seawater by photochemical reactions of the dissolved organic carbon and is present in the growth environment of sponges.
- Ethylene is produced from fire and present in smoke during the oxidation of a hydrocarbon source. Ethylene is explosive at

relatively low concentrations, suggesting that it may be a cause and effect of fire in a feed-forward manner. That is, ethylene is both a product and a substrate of hydrocarbon combustion.

Ethylene In Plant Life

- Ethylene serves as a simple gaseous hormone of plants, integrating external signals with internal processes and adjusting the plant's phenotype to its environment.
- Triggers of ethylene biosynthesis in plants include biotic and abiotic stresses such as infection, wounding, dehydration, hypoxia, abscission, burning, or freezing. Oxidative stress is a potent trigger of ethylene production.
- In fruits, ethylene promotes its own further biosynthesis in a chain reaction. Such feed-forward synthesis is somewhat similar to fire's production of ethylene, which induces further fire. In both cases, the formation of ethylene is oxygen-dependent and anaerobic conditions inhibit ethylene formation.
- Effects of ethylene include modulation of many developmental and aging aspects of the plant biology, including seed germination, root hair development, root nodulation, flower senescence, fruit ripening, abscission, senescence, and apoptosis.
- Zegzouti et al showed that ethylene controls the expression of many genes, suggesting plants co-opt ethylene for broader adaptive use.
- Wounded trees emit ethylene gas, which attracts insects that sense the gas as an indication of exposed tissue they can invade. It is as if such insects smell the fear or stress of plants.
- Ethylene gas is responsible for the "one bad apple spoils the whole

bushel” phenomenon, suggesting that it signals stress within a group, not unlike the alarm call of animals.

- Ethylene released from the fire and smoke of forest fires induces an ethylene-mediated stress response in surrounding trees. These responses include flowering, senescence, ripening and abscission of fruits. It is as if a burning tree is sending alarm calls to the surrounding forest, and the neighboring plants respond by activating mechanisms that can increase the probability of seed dispersion before potential annihilation.

Ethylene In Human History

- The effect of ethylene has been harnessed for food cultivation since antiquity. In the Bible, Amos was described as a “gasher” of figs. Gashing was known to promote stress-mediated ripening of figs.
- In 1779, Priestley referred to Ingenhousz as the first to generate ethylene.
- In 1924, Denny found that smoke from kerosene combustion in lanterns used to de-green citrus fruits contained ethylene as the active ingredient. This demonstrated that ethylene is a fruit-ripening agent that acts in very small amounts. These observations are in agreement with many similar historic reports such as those from China where incense was burnt in closed chambers to ripen pears.
- 107 million metric tons of ethylene were synthesized in 2005, making it the most produced organic compound in the world. Ethylene is used for thousands of applications, including oxidation for surfactants and detergents, halogenation in the PVC process, alkylation for packaging, oxo-reactions in making n-propyl alcohol, as an anesthetic agent, fruit ripening, and as a welding gas.

Ethylene can be produced from natural gas and crude oil, which are the core of the hydrocarbon economy and the source of plastics.

- Ethylene is present in auto-emission.
- Ethylene is approved for spraying bananas, but used for a multitude of other produce. In grocery stores, a fruit is sprayed with synthetic ethylene to “finish” the product—triggering the fruit stress response—so that it takes on a color and taste that appeal to the consumer.
- Ethylene in the US is currently regulated by the Environmental Protection Agency (EPA) and classified as a pesticide. Ironically, as discussed above, many insects are drawn to plant wounds by sensing ethylene.
- The US Center for Disease Control (CDC) lists ethylene as a potential human carcinogen. If ethylene were regulated by the US FDA, it might have been considered for the GRAS (Generally Recognized as Safe) designation. However, since the EPA regulates ethylene, it cannot receive that designation. Hence, there is only environmental regulation of one of the most synthesized chemicals on the planet that is widely consumed by humans, and has little to no FDA oversight.

Ethylene Effects On Humans

- It is believed that ethylene is not produced in species outside the plant kingdom and some microorganisms.
- One fundamental question is whether plant ethylene production has xenohormetic effect (cross-species hormonal effect) on animals that consume them. Ethylene modulates calcium regulation

and other functions in animal cells. Ethylene has a myriad of effects on insects including shortened lifespan.

- Adrenaline and glucocorticoids, which are commonly assumed to be exclusively the stress hormones of animals, appear to have function in plant life, too. Glucocorticoid receptors have been found in plants recently. Their function is now thought to be conserved across animals and plants. Furthermore, adrenaline biosynthesis has been observed in plants and its functions include response to stress and promotion of ethylene biosynthesis. It is intuitively appealing to speculate that stress pathways may be more conserved across the biome than we realize.
- Ethylene has been detected in human exhaled air. It is found in gut microflora, and can lead to production of ethylene oxide, which is known to be a genotoxic human carcinogen.
- Ethylene has been detected emanating from human skin.
- Ethylene was introduced as a gaseous anesthesia in 1923 by Luckhardt and Carter. After many decades of experience, ethylene use declined as better agents emerged. From a risk perspective, ethylene use as an anesthetic has been linked to cardiac arrest, blood pressure fluctuations, water retention, nausea, hyperglycemia, and loss of appetite. Explosions have been reported.
- Nutritional effects of consumption on human health care are not clear.
- In the debate between corn and grass-feeding of livestock, the former is considered less healthy for the cows and the humans that consumed them. Is it possible that corn-fed cows are consuming highly processed corn with high concentrations of ethylene, whereas grass contains less ethylene?

- Humans metabolize ethylene to ethylene oxide, and ethylene oxide has been shown to have potential untoward health consequences.
- In the presence of heavy cigarette smoke, a flower in the room will wilt. High concentrations of ethylene present in cigarette smoke are thought to be responsible for this phenomenon. Smoking has long been known to increase the risk of stress-mediated human diseases such as hypertension and diabetes. Is it possible that ethylene from cigarette smoke is a contributor to human diseases through the stress pathway?

Implications

What are ethylene's implications for human health? This is a critical question because so many aspects of modern plant food production, delivery, and preparation methods likely increase its ethylene content. Off-the-vine ripening, injuries during transport, ethylene spraying, disease, and cultivation in inappropriate environments or seasons can induce stress response in plant flesh. Fermentation is an inducer of ethylene. Cutting a fruit or vegetable, which wounds the flesh and exposes it to oxidative stress, activates ethylene-mediated stress response including browning and sweetening. Food processing inflicts substantial wounds to plant flesh, triggering massive stress response. Storage steps such as drying, salting, and freezing can slow oxidation, but also increase oxidative processes. Preparation techniques including heating, cooking, burning all add oxidative stress to plant-derived foods and trigger ethylene-mediated stress response in the remaining flesh. It is likely, then, that modern plant-derived foods consumed by humans are subject to extreme stress and contain high levels of ethylene and other mediators of stress response. Despite these considerations, the degree to which humans may be consuming ethylene through consumption of "stressed food" remains uninvestigated.

Increasing evidence suggests that environmental stress experienced by a species can be sensed by another species that consumes the former, such that the latter can mount a preemptive, adaptive response to the stress. In the modern food system, however, the stress humans engender in the food supply chain may be coming back full circle to cause maladaptive stress response in humans who consume the stressed foods in a perverse version of “you are what you eat”. The stress that humans induce in plants during cultivation, production, transport and preparation may elicit stress response in food, including the production of stress response molecules such as ethylene, saturated fats, and simple sugars.

Do these signaling molecules modulate stress responses in those who consume them? Does consumption of such stress-signaling molecules increase the risk of stress-mediated chronic diseases observed in humans including hypertension, diabetes, depression, heart disease, and obesity? We believe these questions warrant further exploration.

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Introduction

This year marks the 50th anniversary of “American Girl in Italy,” Ruth Orkin’s iconic photograph of men ogling Ninalee Craig as she walked down a street. Despite the cultural stigma now attached to its practice, the rubbernecking of young beautiful women is an everyday phenomenon. From an evolutionary perspective, prehistoric males who did not instinctively tune to visual cues of potential mates with beneficial traits and fecundity would face adverse natural selection pressure. Presumably, males living today have inherited the tendency to rubberneck nubile females because such proximate behaviors translated to improved ultimate fitness during natural selection.

In similar fashion, people driving by a car accident turn their heads to look. In nature, an organism that does not tune to signals of carnage is ignoring potential useful cues of threat in their vicinity and could be subject to elimination. Our tendency to rubberneck trauma, thus, is an adaptation inherited through evolution through the survivorship bias of those who attended to cues of stress that can improve our Darwinian fitness.

Traits shaped and culled during prior eras of evolution can be rendered maladaptive through contextual dislocation. As environments change, inherited traits may no longer serve to maximize evolutionary

fitness and may even prove counterproductive. Unlike genetic traits that are passed only between kin, memes are knowledge traits that can confer fitness benefits. They can be communicated directly between individuals, but media can also be an effective tool for disseminating and acquiring memes. This paper considers rubbernecking as an evolutionary adaptation and its function in a modern environment of rapid meme transmission.

Sex and Violence Sell

Given the adaptive value of rubbernecking cues of threat to survival and reproductive opportunity in our prehistoric past, it is perhaps not surprising that “sex and violence sell” in modern media. Today’s technology enables delivery of real and manufactured (non-fictional and fictional) cues of threats to survival and reproductive opportunity from great distances to a viewer.

Put another way, viewers seek and tune to such cues irrespective of the degree of association between such proximate cues to ultimate fitness. This is because advancements in media innovation have outpaced biologic evolution. Human intrinsic behavioral traits have not evolved fast enough to account for rapid modern advancement in media innovation. In other words, our intrinsic rubbernecking trait was shaped by evolutionary forces of the prehistoric era and did not factor in the context in which such cues would be developed, managed, and distributed through the modern media mechanism.

The evolutionary dislocation (modern media) renders maladaptive the prehistoric tendency to rubberneck when faced with cues of carnage and reproductive opportunity. For instance, viewers seek—and the media industry delivers—high concentrations of cues of horror, stress, violence, death, child abduction, and trauma. Whether

in the form of fictional horror movies or YouTube videos of violent acts or everyday newspaper headlines, media connects the attentional instincts of viewers with producers of content that are interested in drawing that attention, for monetary gains or gains in status or otherwise. If cueing to such scenes and stories of carnage alters the behavior of the viewer—say, they become more fearful or depressed—then rubbernecking has become maladaptive since such scenes of carnage did not occur in the vicinity of the viewer, or were entirely fictional accounts, and thus should not have induced the behavioral changes that they did.

Similarly, in the prehistoric context, when a male visualized a nude female in a reproductive position, it was because the male was about to engage in an activity that could enhance his fitness. This prehistoric trait, however, did not anticipate the possibility that such cues might simply be pixels on a computer, and not an actual mating opportunity. Spending energy and resources on porn is nothing more than satisfaction of a proximate urge that no longer leads to improved fitness, and could be said to be counterproductive. The industry is more than willing to deliver such cues and extract value from the viewer in the process. The rubbernecking of sexy visual cues, as with violence, is a modern evolutionary dysfunction.

Broader Implications For Media

Human communication behaviors were shaped during the prehistoric era when humans lived among kin networks comprised of closely related individuals. The evolution of human communication did not anticipate the modern era where largely unrelated individuals interact. It is intuitively appealing to speculate on the evolutionary dislocations evident in viewer interactions with modern media content.

- The major fitness altering variables in nature are trauma, sex, food and status changes. The last is particularly important for social species where changes in status can lead to changes in reproductive success. Humans are wired to pay attention to cues that depict changes in status. The change of status can be real. For example, while watching a National Football League game, viewers tune to cues of status change during the game. Attention paid to a game is typically proportional to the number of lead changes. A significant comeback victory near the end, which is a major shift in status, tends to be perceived as a dramatic victory. Humans are highly tuned to watch close sporting contests involving many (close game) or unexpected (dramatic comeback) status changes.
- Humans pay attention to changes in status of elements in their environment such as top 40 albums or top 100 colleges. Humans pay attention to BCS ranking changes every week during college football season. Humans pay attention to Internet news stories about their favorite celebrities experiencing status changes upwards and downwards.
- Such status changes can be fictional, in the form of story narratives that have ups and downs, whether in movies or Shakespearean plays. Stories with nuanced well-crafted status changes tend to be appreciated as good stories and tend to hold the audience's attention.
- Humans are wired to pay more attention to high status individuals than low status ones. One of the determinants of high status in nature is a person's size. Big screen televisions and movie screens enlarge human actors, thus increasing their relative status and drawing heightened attention from the audience. Similar effect is achieved by camera angles and visual effects that make a person appear taller (known as Dutch angle).

- In the tribal context, if a high status individual was offering advice in the form of a meme, it was probably your close relative that had your best interests in mind because promoting your interests enhanced inclusive fitness through kin altruism. Today, when Shaquille O’Neal suggests you drink Sprite, it is not because he has your fitness interests in mind. Indeed, Mr. O’Neal is motivated almost entirely by self-interest, and would dispense such advice to an audience even if it reduced the fitness of the viewer. Despite this one-sided accrual of benefit from the exchange, the model of endorsement-oriented advertising persists: viewers are more than willing to follow such advice even if there is no material benefit to doing so. Simply put, the evolutionary emergence of the prehistoric trait of assimilating advice from high status individuals did not anticipate the modern era when that individual was not a kinsman with altruistic intentions.
- The positioning of news anchors seated at edges of tables could be said to mimic the family dinner table at which the father of a household would communicate events of the day to his family.
- In nature, any movement in the field of view connotes a potential fitness-altering variable. Movement connotes the presence of energy and perhaps signals potential food. Movement can also connote the presence of a threat or a predator. Humans are wired to pay attention to movement. Media content is increasingly exploiting this wiring by delivering scenes at shorter intervals, scenes with fast movement such as car chases, and scenes with many moving parts.

Media forms connections among individuals. In today’s environment, media connects individuals of low-relatedness whereas human attention mechanisms evolved at a time when communication among conspecifics largely occurred among those with shared genetic alignment. There is always some degree of give-and-take of value in

communications, but the misalignment of interest among producers and consumers of content are evident in modern media due to Darwinian dislocation of our rubbernecking traits.

For creators of content, awareness of underlying rubbernecking tendencies of a potential audience can better inform how best to produce and deliver content. For audience members of content, self-awareness of those same tendencies can inform their processing of media content.



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