

## Resolving America's "Predicament"

**"Once the population and economy have overshoot the physical limits of the Earth, there are only two ways back: Involuntary collapse caused by escalating shortages and crises, or controlled reduction of throughput by deliberate social choice."**<sup>1</sup> – Meadows, et al

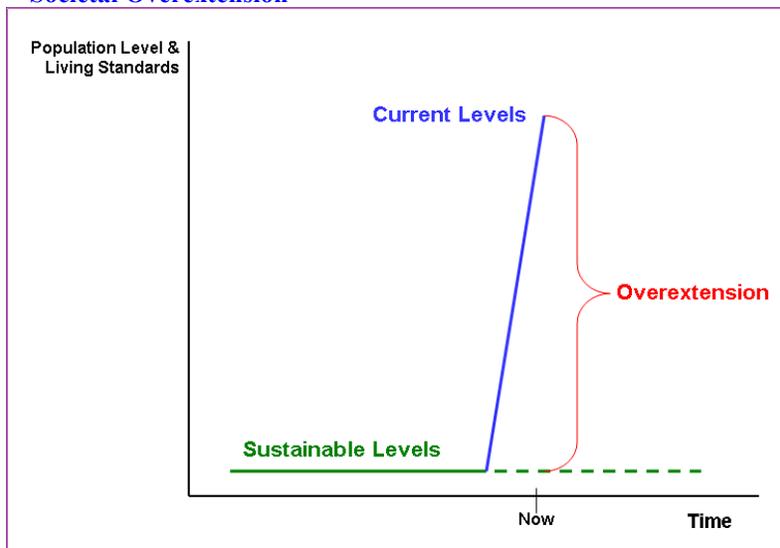
America is irreparably overextended—we are living hopelessly beyond our means ecologically and economically—a condition that is not sustainable. As a result, our American way of life—300+ million people enjoying historically unprecedented living standards—must end, soon, either voluntarily or involuntarily.

- **America's Predicament: Societal Overextension**
- **America's Choice: Voluntary or Involuntary Transition to Sustainability**
- **America's Destiny: Societal Collapse**

### America's "Predicament": Societal Overextension

#### Societal Overextension

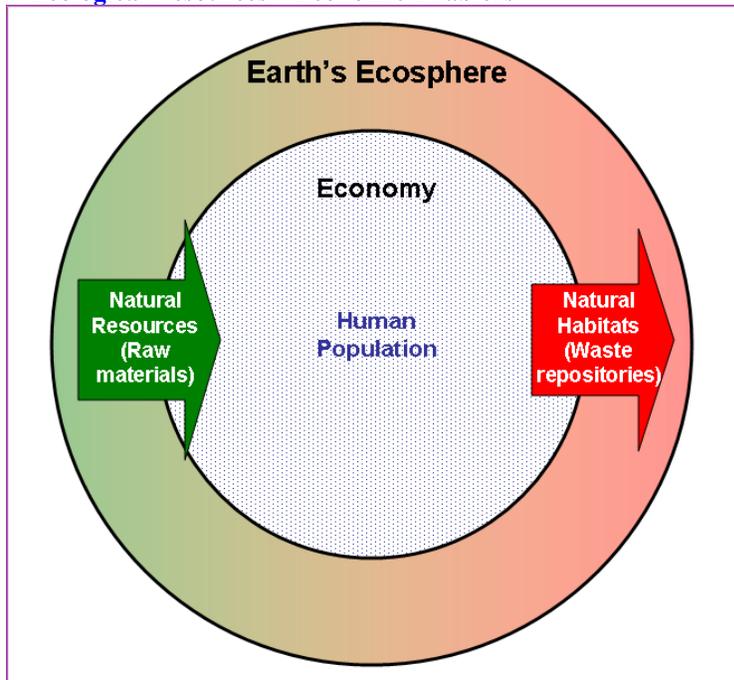
#### Societal Overextension



"Societal overextension" is a condition in which a society is living beyond its means ecologically and economically. The significant consequence associated with societal overextension is that the society's population level and material living standards exceed sustainable levels.

Societal overextension (overextension) occurs when a society's lifestyle paradigm, its "way of life", is enabled by the persistent overexploitation of ecological resources and economic resources.

## Ecological Resources—Economic Enablers



In industrialized societies, ecological resources are the raw materials (natural resources) and waste repositories (natural habitats) that enable people to produce, provision, and utilize goods and services.

Ecological resource overexploitation occurs when a society:

- Persistently utilizes renewable natural resources that are critical to its existence, such as water, croplands, pasturelands, fisheries, and forests, at levels greater than those at which Nature<sup>2</sup> can replenish them;
- Persistently utilizes nonrenewable natural resources that are critical to its existence, such as oil, natural gas, coal, minerals, and metals, which Nature does not replenish; and/or
- Persistently degrades atmospheric, aquatic, and terrestrial natural habitats that are critical to its existence, at levels greater than those at which Nature can regenerate them.

Economic resources provide the “purchasing power” that enables people to procure goods and services. Economic resource overexploitation occurs when a society:

- Persistently depletes its previously accumulated economic asset (wealth) reserves;
- Persistently incurs intergenerational debt, which it has neither the capacity nor the intention to repay; and/or
- Persistently defers indefinitely investments critical to its future wellbeing.

An overextended society and its lifestyle paradigm are unsustainable, and will inevitably collapse.<sup>3</sup>

### American Societal Overextension

Our American way of life is enabled by a culture of persistent resource overexploitation<sup>4</sup> in which we live ever-increasingly beyond our means, ecologically and economically. Our American way of life is based upon our distorted, cornucopian worldview<sup>5</sup>—perpetual economic growth and prosperity enabled by unlimited ecological resources; and our dysfunctional, detritovoric resource utilization behavior<sup>6</sup>—our persistent net depletion of the resources upon which our very existence depends.

Our “predicament”—irreparable societal overextension—is the unintended but inevitable consequence associated with our distorted worldview and our detritovoric resource utilization behavior.

### Our Cornucopian Worldview

Most Americans believe that we can and will achieve perpetual economic growth and prosperity through our ever-increasing utilization of the earth’s unlimited natural resources.

We fail to realize, however, that we live within an enclosed planetary ecosystem, in which resource supplies are finite; except for sunlight and an occasional meteor, no additional resources enter earth’s ecosphere. Unlimited natural resource supplies are, therefore, physically impossible. And, since unlimited natural resource supplies are physically impossible, perpetual economic growth and prosperity, which are contingent upon unlimited natural resources, are physically impossible as well.

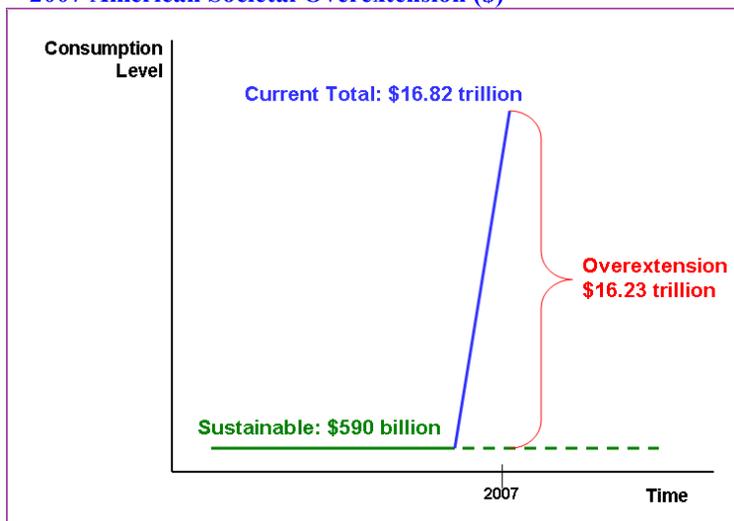
### Our Detritovoric Resource Utilization Behavior

While our prodigious use of ecological and economic resources has enabled spectacular increases in our production level, consumption level, population level, and material living standards over the past 200 years<sup>7</sup>—to levels far exceeding those attainable had we lived sustainably within our means—the inescapable consequence associated with this resource utilization behavior is the systematic elimination of the very resources upon which our way of life depends. Such behavior has obvious limits.

### American Overextension Quantified

The extent to which we are currently living unsustainably beyond our means is appalling.

#### 2007 American Societal Overextension (\$)



In 2007, approximately 96.5% of our total consumption level of \$16.82 trillion, or **\$16.23 trillion**, was unsustainable.<sup>8</sup>

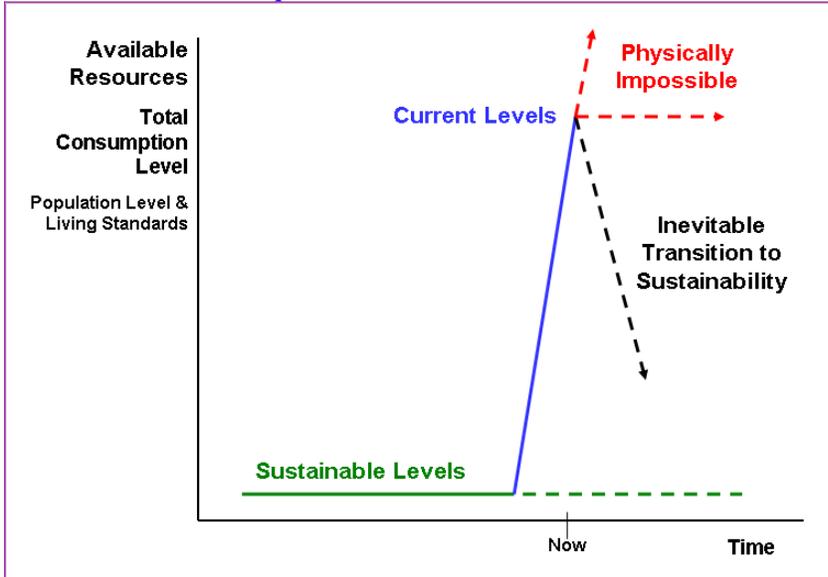
Conversely, only 3.5% of our 2007 total consumption level, or **\$590 billion**, was sustainable.<sup>8</sup>

### Consequences of American Overextension

During the course of our inevitable transition from our unsustainable American way of life to a sustainable lifestyle paradigm, we will experience continuously declining resource supplies, continuously declining total consumption levels, and devastating lifestyle disruptions—significant population level and material living standard reductions.

## Our American Way of Life is Unsustainable

### The Inevitable Consequence of Societal Overextension



Our American way of life is absolutely dependent upon ecological resources and economic resources, the supplies of which will be utterly inadequate going forward to support our existing population level and living standards, let alone continued increases in either or both.<sup>9</sup> As a result, our American way of life—300+ million people enjoying historically unprecedented material living standards—is not sustainable; it must come to an end.

We will transition to a sustainable lifestyle paradigm; sustainability is not optional.

### Our Transition to Sustainability is Imminent

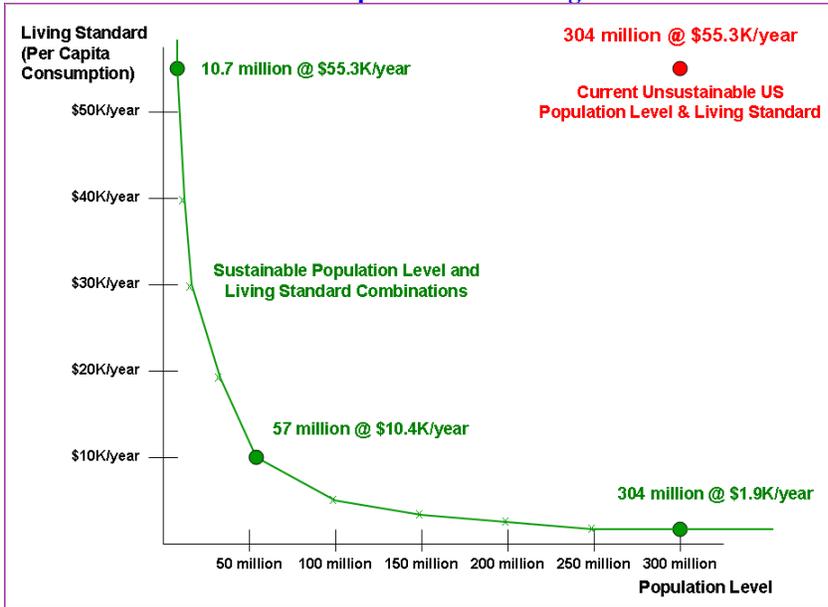
Absent immediate fundamental changes to both our distorted worldview and our dysfunctional resource utilization behavior, American society will collapse—not in 1000 years, or 500 years, or even 50 years; but possibly within 5 years, probably within 15 years, and almost certainly within 25 years. America, as we know it, will cease to exist well before the year 2050.<sup>10</sup>

### Our Societal Collapse will be Devastating

As the historically abundant and cheap ecological resources and economic resources upon which our American way of life depends become increasingly scarce and expensive, a scenario that is already in process, the total level of goods and services available for our consumption will decline dramatically, as must some combination of our population level and material living standards.

As the following “population level/living standard trade-off curve”<sup>11</sup> demonstrates, even under the most optimistic circumstances whereby we transition voluntarily to a sustainable lifestyle paradigm, our estimated population level and living standard combinations<sup>12</sup> attainable “at sustainability” will be significantly lower than those that we currently enjoy.

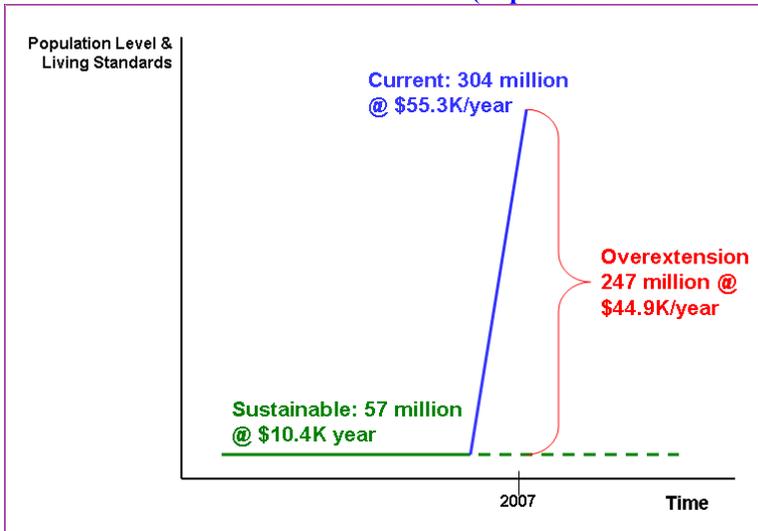
### Estimated Sustainable US Population and Living Standard Combinations



Should we choose to maintain our current 2007 population level of 304 million people, our sustainable average living standard would be approximately 3.5% of its current level—essentially that of Cambodia and Kyrgyzstan today.<sup>13</sup>

If we choose instead to maintain our average 2007 material living standard, America could support a sustainable population of only 10.7 million people.

### 2007 American Societal Overextension (Population and Material Living Standards)

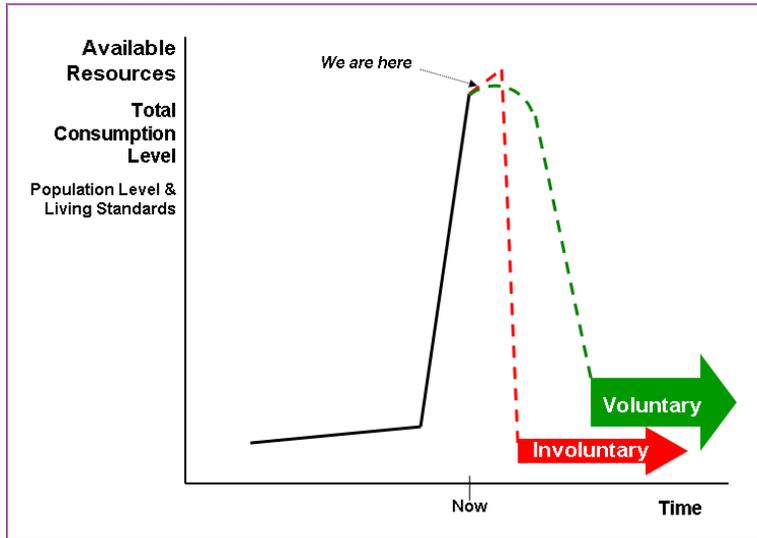


By choosing to reduce our population level and material living standards equally, by approximately 81% each, we could attain a sustainable population of 57 million people with average material living standards, average per capita consumption levels, comparable to those of Iran and Panama today.<sup>13</sup>

While it may not be too late to avert societal collapse, thereby mitigating the horrific lifestyle disruptions associated with an apocalyptic transition to sustainability, it is, unfortunately, too late to totally avoid a painful transition—there can be no soft landing.

## America's Choice: Voluntary or Involuntary Transition to Sustainability

### American's Choice



Our choice is not whether we “want to be” sustainable; our choice involves the process by which we “will become” sustainable. We can transition to a sustainable lifestyle paradigm voluntarily, thereby mitigating our consequent population level and living standard reductions. Or, we can refrain from taking preemptive action and allow Nature to orchestrate our transition through societal collapse, thereby causing us to experience devastating reductions in our population level and living standards.

There are no other alternatives—we “will be” sustainable, either voluntarily or involuntarily; and we will be sustainable soon.

### American Cultural Revolution (ACR)

The only sane resolution to our predicament is an American Cultural Revolution (ACR), during which we will transition quickly, within 25 years, and beginning immediately, from our unsustainable American way of life to a sustainable lifestyle paradigm—a lifestyle paradigm in which we will live within our means ecologically and economically, forever.

### ACR Definition and Benefits

Through an ACR, we will transition voluntarily from our unsustainable American way of life to a sustainable and self-sufficient lifestyle paradigm. An ACR will enable us to optimize both our transition process and the lifestyle attributes—population level and material living standards—associated with our sustainable lifestyle paradigm.

An ACR requires that we change fundamentally both our existing worldview and our existing resource utilization behavior; it requires that we use remaining resources to facilitate our transition process, rather than wasting them on futile attempts to perpetuate our unsustainable American way of life; and it requires that all Americans participate—an ACR is an all-or-nothing undertaking.<sup>14</sup>

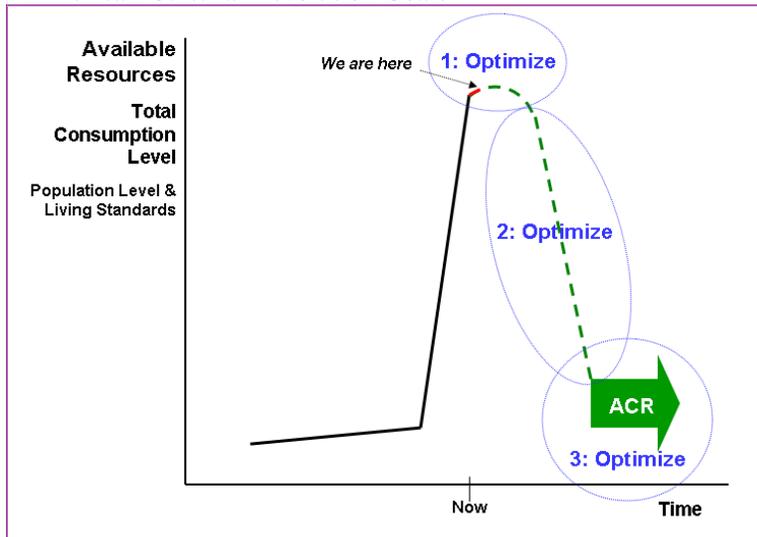
An ACR offers three benefits over societal collapse—control, cooperation, and compassion—which will enable us to minimize lifestyle disruptions during our transition process and to maximize our sustainable population level and material living standards at sustainability.

### ACR Goals and Objectives

Our primary ACR goal is to optimize both the resources available to us and our capacity to effectively utilize those resources throughout our transition process, thereby enabling us to continuously optimize and maximize our total production/consumption levels, thereby enabling us to continuously maximize our attainable population level and living standards.

## ACR Goals

### **American Cultural Revolution Goals**



The ACR transition process consists of three distinct phases, each of which has a corresponding primary goal.

1. **Optimize the “Peak”**: reverse generations of culturally-instilled, physically-impossible-to-achieve expectations regarding ever-increasing total production/consumption levels, population levels, and material living standards, during our change in direction from “more and more” to “less and less”.
2. **Optimize the “Decline”**: adopt fundamental and universal changes in our living arrangements, our vocational endeavors, and our daily existence during our period of continuous “less and less”.
3. **Optimize “Sustainability”**: achieve the highest possible average material living standard for the greatest number of people, within the context of a sustainable lifestyle paradigm.

## ACR Objectives

Each ACR objective must contribute toward achieving one or more ACR goals; it must contribute toward fundamentally modifying our current worldview and resource utilization behavior; and it must minimize the lifestyle disruptions associated with our transition process.

ACR objectives will provide the framework for our “Roadmap to Sustainability by 2033”, by defining 1) our societal preference for the trade-off between attainable material living standards and attainable population levels going forward, 2) the expected mix and levels of natural resources available to us during our transition period and at sustainability, and 3) the optimum mix and maximum levels of goods and services that we can produce, and therefore consume, through the utilization of available resources.

- **Population/Living Standard Trade-off Objective**: determine our desired average material living standards—annual per capita consumption levels—during our transition period and at sustainability. This metric, in combination with our total production level during any time period, will determine our maximum attainable population level during that period.
- **Resource Availability Objective**: identify all available natural resources that could comprise our “transition resource mix”, including nonrenewables, and all available resources that could comprise our “sustainable resource mix”; and forecast maximum annual availability per resource.
- **Resource Optimization Objective**: identify all knowledge and technology that will be available to us during our transition period and at sustainability, which will enable us to optimize our utilization of available natural resources.

- **Total Production/Consumption Level Optimization Objective:** determine the optimum mix and maximum levels of goods and services that we can produce annually, and therefore consume, during our transition period and at sustainability, given available natural resources, knowledge, and technology.
- **Production Scheduling Objective:** forecast the mix and levels of goods and services expected to be produced and provisioned annually during our transition period and at sustainability.
- **Population/Living Standard Adjustment Objective:** forecast our annual attainable population level and average material living standard (average per capita consumption level), given our Population/Living Standard Trade-off Objective and our forecasted annual production/consumption mix and level.
- **ACR Objective Review and Revision:** continuously reassess “resource realities” throughout the ACR implementation period and modify annual ACR objectives accordingly—always retaining 2033 as the year in which sustainability is achieved.<sup>15</sup>

### ACR Initiatives

ACR initiatives are the specific actions that will contribute toward the attainment of ACR objectives. While the definition of specific ACR initiatives is beyond the scope of this paper, critical areas in which ACR initiatives must be defined include the following:

**Sustainable Infrastructure Development:** we must use remaining accessible supplies of nonrenewable natural resources to replace existing systems and infrastructure with systems and infrastructure that can be supported entirely by renewable resources at sustainability. Critical systems and infrastructure include:

- Water treatment and distribution
- Energy production and distribution
- Manufacturing
- Law enforcement
- Communication
- Governance
- Food production, distribution, and preparation
- Housing
- Waste management
- Transportation
- Healthcare
- Education

**Production Mix Optimization:** we must produce goods and services that will maximize our attainable population levels and living standards going forward; primary focal sectors include:

- Farming/Agriculture
- Energy Generation
- Hunting/Fishing/Gaming
- Mineral/Metal Recycling
- Timber/Forests

**Population Reduction:** we must reduce our population level<sup>16</sup>, as required, during our transition period, in order to achieve sustainable population levels consistent with our material living standard preferences and the total levels of goods and services available for consumption. Population reduction methods that do not involve open conflict include:

#### Fertility Rate Decrease

- Birth control
- Sterilization
- Abortion
- Infanticide

#### Mortality Rate Increase

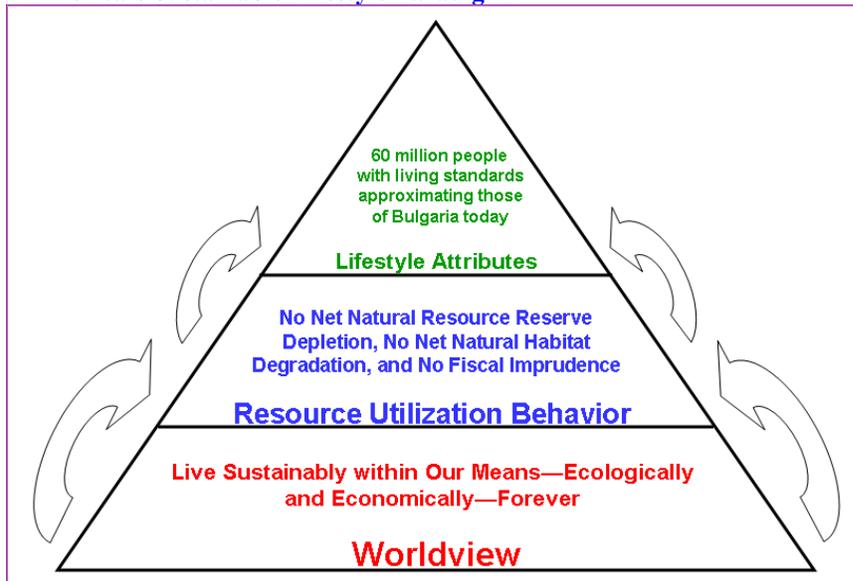
- Suicide
- Assisted suicide
- Euthanasia
- Elimination of “life support” systems and medications

#### Immigration Elimination

- Terminate further immigration
- Deport illegal immigrants

## Sustainable Lifestyle Paradigm Imperatives

### America's Sustainable Lifestyle Paradigm



We must refrain from further attempts to make ecological and economic reality conform to our cornucopian worldview and detritovoric resource utilization behavior, and adopt a worldview and resource utilization behavior that conform to ecological and economic reality.<sup>17</sup>

Our new worldview must reflect the reality that our total production/consumption level and our resulting population level and material living standards must be constrained by sustainable supplies of ecological and economic resources—forever.

Our new resource mix must consist entirely of domestic renewable natural resources, domestic recycled nonrenewable natural resources, and domestic natural habitats; and our new resource utilization levels must involve no net depletion of natural resource reserves, no net degradation of natural habitats, and no fiscal imprudence—ever.

### Societal Collapse

An American Cultural Revolution is the voluntary resolution to our predicament; all other courses of action<sup>18</sup>, including “feel-good” efforts to “move toward sustainability”, will result in an involuntary resolution—societal collapse. Unlike an ACR, which employs a controlled and methodical transition to a sustainable lifestyle paradigm, societal collapse involves an unstructured and chaotic transition orchestrated by Nature; the associated lifestyle disruptions will be catastrophic.

### Signs of Impending Societal Collapse

Stability is essential to the perpetuation of highly-complex industrialized societies such as that of the US. Social, political, and economic “order” are prerequisites to an operating environment within which countless human and non-human elements can interact effectively and efficiently.

Ever-increasing scarcity associated with supplies of the critical resources that enable the orderly operation of a society’s social, political, and economic systems will lead to societal instability, social unrest, and, ultimately, to societal collapse. Such a scenario has been unfolding in America over the past several decades:

- **Resource Shift:** supplies of critical enabling ecological and economic resources such as fossil fuels, minerals, metals, and credit are becoming increasingly scarce and expensive; the real costs and prices of goods and services are rising as a result; and real economic growth and average material living standards are stagnating—our “perpetual growth and prosperity” status quo has been disrupted.

- **Attitude Shift:** ever-increasing uncertainty regarding our future wellbeing has altered our prevailing attitudes from confident, optimistic, and “future oriented” to uncertain, pessimistic, and “instant gratification oriented”; we are becoming increasingly impatient, anxious, and distrustful.
- **Behavioral Shift:** our focus has shifted from savings, investment, and production to debt, deferred investments, and consumption; our willingness to work for a better future has been displaced by an almost manic desire to maximize current consumption; our willingness to collaborate and cooperate, both domestically and internationally, is giving way to belligerent behavior and conflict.
- **Lifestyle Paradigm Shift:** several critical resources are at, near, or past their production “peaks”<sup>19</sup> and will decline continuously in availability—resource scarcity will be displaced by resource shortages, which will be displaced by resource disruptions; our social, political, and economic “leaders” will come under increasing pressure to “fix” increasingly severe ecological and economic problems that they cannot fix; an array of ecological and economic limits and tipping points, which are stressing our social, political, and economic systems to their breaking points, are imminent; meanwhile we continue to waste precious remaining resources on futile attempts to perpetuate our unsustainable American way of life.

As the world’s most complex industrialized society, we are also the most vulnerable to collapse.

### Anatomy of a Societal Collapse

Each of the following “critical systems” is comprised of a highly complex mosaic of interrelated, yet independently operating, entities and infrastructure:

- Water retention, treatment, and distribution
- Food production and distribution
- Energy resource exploration, extraction, processing, and distribution
- Electricity generation and distribution
- Waste management
- Healthcare
- Telecommunications

These and other critical systems must function continuously and efficiently at the local, regional, and national levels as a prerequisite to the perpetuation of our American way of life.

Essential to the continuous and efficient operation of each of these critical systems are constant and enormous inflows of ecological and economic resources; the coordinated efforts of millions of highly specialized and skilled people in developing, producing, provisioning, managing, and operating innumerable costly and complex physical assets; and a stable operating environment.

In times of abundant and cheap ecological and economic resources, these criteria are easily met; in times of increasingly scarce and expensive resources, these criteria become increasingly difficult to meet; in times of resource shortages and disruptions, these criteria become impossible to meet.

Continuously diminishing ecological and economic resource supplies will cause irreparable breakdowns to our critical systems, which will cause our American way of life and American society to collapse.<sup>20</sup>

**“When confronted with ever-declining resources, the preservation of social order requires more and more cooperation, but individuals are genetically programmed to reduce cooperation and seek advantage. This genetic legacy sets up a positive feedback loop: declining common resources cause individuals to reduce cooperation even more, which reduces common resources even faster, which leads to collapse even faster.”<sup>21</sup> - Hanson**

## America's Destiny: Societal Collapse

America's paradox: the only sane solution to our predicament is an impossible solution...

### American's Destiny



The real “inconvenient truth” is that we will not take preemptive action to mitigate the inescapable consequences associated with our predicament. We will not choose to modify voluntarily our distorted, cornucopian worldview and our dysfunctional, detritovoric resource utilization behavior through an American Cultural Revolution. In the absence of an almost inconceivable series of 11<sup>th</sup> hour miracles<sup>22</sup>, societal collapse is inevitable; the only remaining issues are its timing and circumstances.

### America's Collapse is Inevitable

It is not the case that nothing can be done to avert societal collapse; it is the case that nothing will be done...

We will refuse to even consider “subjecting ourselves” to an American Cultural Revolution because the goals, objectives, and initiatives associated with such an undertaking will be deemed too repugnant to contemplate.<sup>23</sup> Instead, we will maintain business as usual—we will attempt to perpetuate our American way of life at all costs, and we will persist in blaming our ever-worsening predicament on “them”, our political and economic “leaders”.

We will continue to insist that “they” fix “it”—our predicament—when, in fact, it is **WE** ourselves who are responsible for “it”<sup>24</sup>, and for the fact that “it” cannot be “fixed”—because we will not allow it to be fixed.<sup>25</sup> Fixing our predicament would require that we voluntarily abandon our unsustainable American way of life and live sustainably within our means forever—a “sacrifice” that we consider to be “totally unacceptable”; after all **“the American way of life is not negotiable”**.<sup>26</sup> - **George H. W. Bush**

We will, therefore, adhere blindly and steadfastly to the notion that we are entitled to our unsustainable American way of life, right up until the instant that Nature fixes our predicament for us, horrifically.

### America's Collapse will be Apocalyptic

While the specific timing and circumstances associated with our societal collapse are uncertain; it is certain that collapse is imminent; it will be deep; it will be rapid; and it will be horrific...

- Given the vast number of ecological and economic limits and tipping points that we are rapidly approaching<sup>27</sup>, our collapse could possibly occur within 5 years, will probably occur within 15 years, and will almost certainly occur within 25 years.

- The variances between our current population level and living standards and sustainable population level and living standard combinations are enormous; the reduction in some combination of our current population level and our material living standards will be enormous as well.
- Because we are busily exhausting remaining “surplus” resources in desperate and futile attempts to perpetuate our American way of life, we will retain insufficient resources going forward to moderate our descent; our collapse will be a freefall.
- Nature will orchestrate our transition to sustainability through famine, disease, and pestilence. Nature is indiscriminate, uncompromising, remorseless, and typically excessive. American hopes, dreams, beliefs, and expectations are totally irrelevant to Nature.

Most Americans believe that we are “exceptional”<sup>28</sup>—we perceive ourselves to be superior to other nations and to other living species. We are certainly exceptional, but not in the sense that we perceive ourselves to be. We are exceptionally detritovoric in our resource utilization behavior—we are systematically eliminating the ecological and economic resources upon which both our way of life and our very existence depend, with exceptional rapidity. As a result, we are likely to become the shortest reigning dominant species in the history of our planet.

**“The overshoot and collapse of industrial civilization was assured once humanity became dependent on the rapid exploitation of nonrenewable resources on a finite planet.”<sup>29</sup> - Duncan**

## Endnotes

(1) From “GeoDestinies” by Walter Youngquist, National Book Company, Portland, OR, 1997, pg. 486; originally from Meadows, D. H., et al., “Beyond the Limits - Confronting Global Collapse - Envisioning a Sustainable Future”; Chelsea Green Publishers, Post Mills, Vermont, 1992, pg. 300.

(2) The term “Nature”, as used in this paper, refers to the inestimable number of physical, chemical, and biological processes and phenomena that define the physical world in which we live; neither consciousness nor a physical manifestation is attributed to “Nature”.

(3) For details regarding the relationship between resource overexploitation and societal collapse, see Jared Diamond’s “Collapse-How Societies Choose to Fail or Succeed”, Penguin Books, 2005; Joseph Tainter’s “The Collapse of Complex Societies”, Cambridge University Press, 1988; and Richard Duncan’s “The Olduvai Theory-Sliding Toward a Post-Industrial Stone Age”, 1996 <http://www.dieoff.org/page125.htm>.

(4) We have become extremely adept at increasing our “current” consumption level by living off the past, by living off the future, and by short-changing the future. We live off the past by depleting nonrenewable energy resource reserves and non-energy resource reserves, and by depleting our accumulated economic asset (wealth) reserves. We live off the future by incurring ever-increasing amounts of intergenerational debt, by persistently depleting renewable natural resource reserves, and by persistently degrading natural habitats. We short-change the future by deferring investments in essential infrastructure, by underfunding social insurance and retirement programs, and by persistently eliminating life-enabling biodiversity. For specifics see Chris Clugston’s “Nature’s Wake Up Call”, pgs. 13-14, 2007.

(5) For a general explanation of the cornucopian worldview see Wikipedia <http://en.wikipedia.org/wiki/Cornucopian>; for a critical assessment of the cornucopian worldview see “The Cornucopian Fallacies” by Lindsey Grant - <http://dieoff.org/page45.htm>.

(6) On page 168 of “Overshoot”, William Catton offers a general explanation of detritus ecosystems, in which organisms, detritivores, consume the finite food supply available within their habitat, bloom in the process, then crash (die-off) once the food supply becomes exhausted. He then goes on to explain detritivoric behavior as it pertains to human beings, “It is therefore understandable that people welcomed ways of becoming colossal, not recognizing as a kind of detritus the transformed organic remains called “fossil fuels,” and not noticing that Homo colossus was in fact a detritivore, subject to the risk of crashing as a consequence of blooming.”; “Overshoot”, page 169; also - <http://dieoff.org/page15.htm>.

(7) Between the years 1800 and 2007, our population level increased by over 57 times—from 5.3 million to 304 million. During the same period, the size of our economy, as defined by annual US Gross Domestic Product (GDP), increased by over 1700 times—from \$8 billion to \$13.8 trillion (2007 dollars)! As a result, our average material living standard, as defined by annual per capita GDP, increased by a phenomenal 30 times—from \$1,500 to \$45,400 (2007 dollars)—despite our 57X growth in population! Statistics obtained from MeasuringWorth.com; <http://www.measuringworth.com/>.

(8) For details regarding the derivation of the figures in the diagram, see Chris Clugston's "Quantifying Overextension – "America's Predicament" <http://www.energybulletin.net/node/46892>.

(9) The physical supplies associated with peaking nonrenewable natural resources and persistently "mined" renewable natural resources are declining and will continue to decline in absolute terms. Increasing internal use by traditional natural resource exporters, increasing natural resource demand by developing countries, and increasing sequestration by foreign owners of increasingly valuable natural resources will also continuously reduce the supplies of natural resources available to the US. For specifics see Chris Clugston's "Nature's Wake Up Call", pgs. 13-14, 2007. As an example of impending resource inadequacy, approximately 90% of the 7 billion tons of natural resources—energy resources and non-energy mineral resources—that served as primary inputs to the American economy in 2007 were nonrenewable; supplies associated with these resources will peak or have peaked, and will decline continuously and remorselessly to exhaustion. Chris Clugston, "Quantifying Overextension—America's 'Predicament'" <http://www.energybulletin.net/node/46892>, pg. 5, 2008.

(10) Richard Duncan is one of many scholars who have argued compellingly that the collapse of industrial civilization is imminent—within the next 25-30 years; see "The Olduvai Theory-Sliding Toward a Post-Industrial Stone Age", 1996 <http://www.dieoff.org/page125.htm>.

(11) For details regarding the derivation of the "population level/living standard trade-off curve", see Chris Clugston's "Quantifying Overextension – America's 'Predicament'" <http://www.energybulletin.net/node/46892>.

(12) Our actual population level/living standard combinations attainable within a sustainable lifestyle paradigm cannot be known with certainty at this point, because the factors that will determine our attainable population level and living standards at sustainability—the specific mix and levels of domestically available ecological and economic resources, and our capacity to effectively utilize those resources—cannot be known with certainty at this point. Note too that the "sustainable" population level/living standard estimates presented in the paper assume an agrarian lifestyle paradigm, which is not truly sustainable over the long term. These estimates undoubtedly exceed by at least an order of magnitude the population level and material living standard combinations that will be attainable within a truly sustainable hunter-gatherer lifestyle paradigm.

(13) 2007 per capita GDP data from IMF, World Bank, and CIA Factbook (Wikipedia) [http://en.wikipedia.org/wiki/List\\_of\\_countries\\_by\\_GDP\\_\(PPP\)\\_per\\_capita](http://en.wikipedia.org/wiki/List_of_countries_by_GDP_(PPP)_per_capita).

(14) Attempts to implement an ACR involving less than 100% participation will fail, because those who support ACR goals and objectives by voluntarily reducing their consumption levels will essentially subsidize the continued profligacy of those who do not. ACR participants will ultimately become disillusioned and revert to their profligate resource utilization behavior, and the effort will dissolve.

(15) Extending the ACR implementation interval, while seemingly affording us additional time to transition to a sustainable lifestyle paradigm, also increases the probability of societal collapse in the meantime.

(16) Our ability to optimize our population levels and living standards during our transition period and at sustainability will be dependent upon our capacity to continuously optimize our utilization of available natural resources, which will enable us to continuously optimize the mix and maximize the level of goods and services available to us for consumption. Accordingly, our population at any given time must consist exclusively of producers—individuals possessing the knowledge, skills, and/or physical attributes that will enable us to optimize our utilization of available resources at that time and going forward.

(17) The roots of America's existing unsustainable worldview and resource utilization behavior are found in the Bible - Genesis 1:28 - "...subdue it [the earth]: and have dominion over the fish of the sea, and over the fowl of the air, and over every living thing that moveth upon the earth". The worldview and resource utilization behavior to which Americans must subscribe if we wish to transition to a sustainable lifestyle paradigm must be consistent with the following Native American proverb - "We do not inherit the Earth from our Ancestors; we borrow it from our Children".

(18) Maintaining business as usual, attempting to perpetuate our American way of life, will certainly lead to societal collapse. Efforts to “move toward sustainability” by slowing or reducing economic growth, reducing fiscal deficits or debt, stabilizing or reducing human population levels, curbing GHG emissions, conserving natural resources, subsidizing the fiscally imprudent, etc. are simply misdirected; they will, at best, defer societal collapse, not avert it. Such efforts are actually counterproductive because they create a false impression of meaningful action. So long as our resource utilization behavior remains detritovoric, we are destined for societal collapse.

(19) Supplies of fossil fuels—oil, natural gas, and coal—which currently provide 87% of our primary energy in the US, are at or near “peak” production, after which their supplies will decline continuously and remorselessly; see: “Peak Oil is Here”; The Oil Drum. <http://www.theoil Drum.com/node/3014#more>. “Annual Energy Outlook 2007”; Natural Gas Supply, Disposition, and Prices – Table 13 [http://www.eia.doe.gov/oiaf/aeo/pdf/aeotab\\_13.pdf](http://www.eia.doe.gov/oiaf/aeo/pdf/aeotab_13.pdf); “International Energy Outlook – Table A6 [http://www.eia.doe.gov/oiaf/ieo/excel/ieoreftab\\_6.xls](http://www.eia.doe.gov/oiaf/ieo/excel/ieoreftab_6.xls). “Exxon: Natural Gas Has Peaked in North America”, <http://www.reuters.com/article/Utilities/idUSN2163310420050621>; “Past Peak, Cause for Alarm” [http://www.pastpeak.com/archives/2005/06/exxon\\_natural\\_g.htm](http://www.pastpeak.com/archives/2005/06/exxon_natural_g.htm); Laherrere (2004). “Future of Natural Gas Supply” <http://www.peakoil.net/JL/BerlinMay20.pdf>. Vaux, G., “The Peak in US Coal Production”; FTW Publications, [http://www.fromthewilderness.com/free/ww3/052504\\_coal\\_peak.html](http://www.fromthewilderness.com/free/ww3/052504_coal_peak.html); EWG (2007). “Coal: Resources and Future Production”, page 8, The Energy Watch Group [http://www.energywatchgroup.org/fileadmin/global/pdf/EWG\\_Report\\_Coal\\_10-07-2007ms.pdf](http://www.energywatchgroup.org/fileadmin/global/pdf/EWG_Report_Coal_10-07-2007ms.pdf).

Supplies of many critical non-energy minerals have already peaked, and others will peak in the near future; see L. David Roper; “Where Have all the Metals Gone?”, 1976 (“approximately three-fourths of the metals have apparently already peaked in production rate in the United States and one-fourth of the world metals have peaked.”, page 4) <http://www.roperld.com/minerals/metalgone.pdf>. We currently import at least 50% of 42 essential industrial minerals and metals, including gallium, potash, palladium, tin, cobalt, titanium, chromium, and zinc; 19 of these minerals and metals including bauxite (aluminum), manganese, rare earths, tantalum, and vanadium are imported 100%; USGS, “2007 Net Import Reliance for Selected Nonfuel Mineral Materials”, 2008 <http://minerals.usgs.gov/minerals/pubs/mcs/2008/mcs2008.pdf>.

We have been able to increase our “current” consumption level of goods and services through ever-increasing borrowing at all levels; in 2007 alone, our new borrowing totaled \$4.4 trillion—over 35% of our national income! While such a trend is obviously unsustainable, the critical issue is “how much debt is too much”? As a point of reference, total US debt immediately prior to the “1929 crash” stood at 260% of our Gross Domestic Product (GDP); our total debt at the end of 2007 was 324% of GDP—and is ever-increasing [http://www.gold-eagle.com/editorials\\_04/matlack072304.html](http://www.gold-eagle.com/editorials_04/matlack072304.html) “Gold: Back to the Future?”; Downs and Matlack; 2004; and <http://www.federalreserve.gov/releases/z1/Current/annuals/a2005-2007.pdf> “Flow of Funds Accounts of the United States” (Tables L.1 F.1, F.6, and F.7); US Federal Reserve.

(20) Supply shortages or disruptions associated with all or even the most critical resources, or breakdowns in all or most of our critical systems need not occur in order to cause severe lifestyle disruptions or societal collapse. As Liebig’s Law of the Minimum observes, “growth is controlled not by the total of resources available, but by the scarcest resource (limiting factor)”. Wikipedia [http://en.wikipedia.org/wiki/Liebig's\\_law\\_of\\_the\\_minimum](http://en.wikipedia.org/wiki/Liebig's_law_of_the_minimum).

(21) From Jay Hanson “Thermo/Genie Collision - On Human Nature, Energy, and Collapse, 2007 [http://www.thesocialcontract.com/artman2/publish/tsc1703/tsc\\_17\\_3\\_hanson.shtml](http://www.thesocialcontract.com/artman2/publish/tsc1703/tsc_17_3_hanson.shtml).

(22) Our cornucopian worldview holds that new ecological resources and economic resources—energy resources, non-energy resources, natural habitats, and purchasing power sources—will always emerge in sufficient quantities to seamlessly offset dwindling supplies of existing resources, thereby enabling us to perpetuate our American way of life indefinitely. Given the large number of depleting resources upon which our current lifestyle paradigm depends, the enormous quantities of these resources necessary to perpetuate our way of life, and the lack of known substitutes that can scale sustainably to required levels, such a presumption is groundless. Reliance on 11<sup>th</sup> hour miracles as “Plan A” is a recipe for disaster.

(23) An ACR requires centralized planning, administration, and enforcement—there can be no public debate, waffling, or backsliding at each phase of implementation. Too, successful implementation requires unquestioned compliance with ACR goals, objectives, and initiatives by all Americans—even if it means death. It is impossible to obtain sustained and unqualified support for such a program in America, even though all alternatives will certainly produce more deaths and lower living standards.

(24) All Americans past and present, but primarily those of us living since the inception of our industrial revolution, are responsible for our predicament. We are directly responsible through our individual overexploitation of the ecological resources and economic resources upon which our American way of life depends. More importantly, we are indirectly responsible as the ever-so-willing beneficiaries of resource overexploitation perpetrated on our behalf by our political and economic “leaders”, even as we revile them in the process.

(25) Our political and economic “leaders” are doing exactly what we have elected them to do; they are attempting to perpetuate our American way of life at any cost. They will do whatever they can on our behalf, as we do individually, to achieve that objective. The unspoken social contract between the American public and our political and economic leaders: “We won’t ask questions about how you do it—any type of duplicity, hypocrisy, hidden agenda, manipulation, or international aggression is acceptable—just don’t jeopardize our ‘right’ to our American way of life. If you can’t, won’t, or claim to be unable to ‘guarantee’ that ‘right’, you are out...”

(26) President George H. W. Bush, at the 1992 Earth Summit in Rio de Janeiro.

(27) For an overview of the major impending limits to our dysfunctional ecological and economic resource utilization behavior, see Chris Clugston’s “Our American Way of Life is Unsustainable—Evidence”; 2008 <http://www.energybulletin.net/node/46276>.

(28) Deborah Madsen offers an excellent overview of the Puritan’s view of American exceptionalism in “American Exceptionalism”, pgs 2-3

[http://books.google.com/books?hl=en&id=hOW1KB026LcC&dq=american+exceptionalism&printsec=frontcover&source=web&ots=i4rxAwjo5L&sig=aFA-SPBjbBcJS0moYd67XeH0ZYc&sa=X&oi=book\\_result&resnum=2&ct=result#PPA3\\_M1](http://books.google.com/books?hl=en&id=hOW1KB026LcC&dq=american+exceptionalism&printsec=frontcover&source=web&ots=i4rxAwjo5L&sig=aFA-SPBjbBcJS0moYd67XeH0ZYc&sa=X&oi=book_result&resnum=2&ct=result#PPA3_M1); see also the Wikipedia overview of American exceptionalism - [http://en.wikipedia.org/wiki/American\\_exceptionalism](http://en.wikipedia.org/wiki/American_exceptionalism).

(29) From Richard Duncan, “The Olduvai Theory”, 2006 <http://www.thesocialcontract.com/pdf/sixteen-two/xvi-2-93.pdf>.

Author Bio (Chris Clugston): For the past three years I have conducted extensive independent research into the area of sustainability, the goals of which are to quantify from a combined ecological and economic perspective the extent to which America is currently overextended—living unsustainably beyond our means—and to understand the causes, implications, and possible solutions associated with our predicament.

Prior to that I spent thirty years working with information technology sector companies in marketing, sales, finance, M&A, and general management—the last twenty as a corporate chief executive and management consultant. I received an AB/Political Science, Magna Cum Laude and Phi Beta Kappa from Penn State University, and an MBA/Finance with High Distinction from Temple University in Philadelphia, PA.