

## Consumerism, Climate Change and Voluntary Renunciation

*Dr. Mohammad Israr Khan\*<sup>1</sup>*

### **Abstract**

*Majority of the scientific community has come to believe that the climate of earth is showing abnormal variations in critical determinants like temperature, precipitation and polar ice and sea levels etc. Mountainous consumption levels of world population, especially the commodity fetish of the rich societies and peoples, are, in large part, responsible for ecological and climatic deterioration. Mainstream economic behavior remains obsessive of commodity based utility and profit maximization. Growth imperative of global economies, thereby, adds momentum to resource depletion and pollution accumulation. Affluent entities, individuals and states, seem to have created for them a narcissist consumer self, added by an accentuated alienation of the self from historical symbiosis between man and nature along social and spiritual confluence. Voluntary renunciation of non-basic consumption forms, therefore, seems to have become inevitable in order to restrict the damage already done to earth's atmosphere.*

*The article attempts to discuss the climatic causation of consumerism and the need to have a consciousness of ecological prudence. The role of voluntary simplicity and want-lessness is discussed in this regard. The concept of renunciation is evolved in the perspective of Asiatic spiritualism as the substance of the discussion which aims at concern with 'our common future'.*

---

<sup>1</sup> Dr. Mohammad Israr Khan Faculty member, Department of Applied and Regional Economics Mahatma Jyotiba Phule Rohilkhand University, Bareilly. Email: drmisrarkhan@gmail.com.

“The American way of life is not up for negotiation.” George Bush<sup>ii</sup>.

## INTRODUCTION

Atmospheric change in the environment of the solar planetary is a part of evolutionary process. Natural climate of the earth planet also follows the laws of evolutionary thermodynamics at a macro level across innumerable factors. Atmospheric environment of earth is a self-controlling, self-adjusting and self-equilibrating mechanism over the celestial time scale in both the linear and cyclical directions. Cooling of earth and creation of livable conditions is a part of linear climate adjustments. While the atmospheric cycles like seasonal cycles and water cycles are part of cyclical equilibrating mechanism.

Presence of biotic life adds another component to climate causations in addition to inanimate factors. Though, the biotic life, in turn, is also a component of self-adjusting mechanism.

However the advent of *Homo sapiens* on the earth is something both in and out of this self-equilibrating routine. On a celestial or macro level man is a part of the environment and identity of its material substance is subsumed in planetary matter. In such a form man can not be a causative factor for atmospheric deviations. Yet, on the other hand, man has a consciousness not subsumed in matter alone; and the power to act upon the causative factors. Viewed this way human actions become an important factor in the climatic ecology of the earth. By the time man acquired technical and controlling powers the outer surface of the earth, running hundreds of miles vertically, is experiencing the effects of human presence in the form of substantial changes in the balance of soil deposits, water flows, subsoil confinements, floral and faunal composition etc.

Man has really left its inerascable imprints on the earth. No doubt man has a sense of beauty and of the opposites of beauty according to its consciousness. Man thereby causes changes in the structures of the earth; well in addition to the requirements of its survival essentials. Egyptian pyramids, Ajanta, Ellora and Elphantine caves, Taj Mahal, travels to Moon and Mars, cross ways, airways, metros, sky high buildings etc. etc. are big footprints of human existence on earth. Man has long ago had acquired one more critical appetite that is to be victorious over the nature. This killing battle of man with nature is the issue of our debate and discussion over climate change and economic development.

## CLIMATE CHANGE AND ECONOMIC DEVELOPMENT

The concept of climate change refers to the observed phenomena of unexpected, sudden and drastic but frequent variations in critical climatic variables like temperature, precipitation, atmospheric pressure, seasonal cycle and so, over the time and across the globe, with serious repercussions for biotic ecology and human environment. However, there are sides to the narration of climate change. A large part of scientific community holds that something abnormal is going on, and accumulating there over the horizon. The other part says that there is no critical environmental danger there because the magnitude and composition of climatic variables are not at significantly abnormal deviations from the natural long run coefficients. On the whole there is a feeling of change in atmospheric and climate conditions as measured by the parameters of temperature, rainfall and rain cycle, elemental composition of polar ecology and radiation balance etc. The second issue of importance is how much of the perceived change is part and parcel of self-equilibrating natural phenomena and how much of it is due to causations out of auto-adjusting atmospheric attributes.

The Brundtland Commission's (1987)<sup>iii</sup> deliberations are a great love of labor to suggest that the sustainability of both the climatic conditions and human existence is at a substantial turnabout. The post-enlightenment and post-industrialization economic expansion and ecological exploitation have come to a stage where auto-introspection has become a must. In the absence of reorientation of economic discourse the winnable scores over nature might fall upside down. Man can ignore nature for too long only at a risk of intergenerational deterioration. Climate change has come to such serious levels that the issues of "the decline in productivity and the acceleration of social dislocation and destitution" (Bhattacharya, 2001: 4) have become imminent.

Economic development has much to take from, and give to, and much bearing on, the nature and composition of planetary atmosphere and ecology. Once the societies transform themselves into *economies* and the simple and earthen use values of human necessities turn into *consumer luxuries* and *producer obsessions* of the *economic man* the scenario of nature's theatricals is bound to vary. Which way?

Out of a whole continuum, running very large, of human actions called economic activities, some have reached a level of critical concern. These are, to quote a few:

- ♦ Energy exploitation;
- ♦ Hydrocarbon extraction, burning and consequential thermal and carbonic emissions;

- ♦ Mineral exhumation;
- ♦ Chemical processing and production;
- ♦ Agricultural soil exploitation;
- ♦ Biotic and abiotic disarticulation;
- ♦ Economic externalities; and
- ♦ Wastage.

Apart from the natural sciences community the economic fraternity, too, is unanimous to hold the thesis of causative deterioration of developmental environment. The developed world holds that it needs more economic expansion to maintain growth momentum. In the absence of growth or in case of zero growth recession sets in. Hence, like the tonic effects of the devil of inflation, vitality of incremental leviathan growth is necessary to keep the wheels of economy moving without breakage. The developing world on the other side requires higher growth rates to feel the soothing touch of economic development and to remove the poverty of masses. Those who have attained higher levels of affluence allege that absence of richness in poor societies is the cause of environmental degradation and economic progress will be a critical factor in nullifying the pollution and other dangers posed by the third world poverty. Is there any end to economic positivism of the affluent logic?

When we are searching for interdependence in climate change and environmental degradation our explicit or implicit hypothesis is that there is a causative association between contemporary economic materialism and earth climate, flowing from the former to the latter. The flow of causation springs up from the over exploitation of the nature and of all that that goes with nature. The fact that nature's capacity is a given one was realized by the classicists long ago. David Ricardo<sup>iv</sup> while articulating his theory of rent and capitalist distribution had explicitly assumed the scanty and miserable expanse of nature's bounties. T R Malthus<sup>v</sup>, too, had endeavored to warn the future generations to keep their numbers within feasibility zones because of nature's limited capacities to provide providence to unmanageable human congregations. Till the time, the essence of the argument of natural constraints is always implicit in economic analysis as an aid to strike a most optimizing balance between unlimited needs and limited resources.

It seems that economic science has been read backwards at a linear geometrical angle. Instead of adjusting its needs to nature's capacities the world of *economic men* has, since enlightenment, been incessantly expanding the scale of exploitation of nature's limited capacities at a faster and non-replenishment levels to gratify its unending expanse not only of necessities but of luxuries and whims as well. So the time has come to take the right

perspective while balancing the needs and resources. Instead of manipulating the resources infinitely what the global community, particularly the affluent ones, is logically bound to do is to adjust its needs framework downwards adapting itself to the nature's realm of providence. Let the nature take a rest to replenish its bowl so that it overflows the fruits of life to future generations of mankind.

## CONSUMERISM

Consumerism is an extension and outcome of the conceptualization of *economic man* and its *self-interest* manifested by *utilitarian* matrix of *pain* and *pleasure* residing in material *commodities*. Utilitarianism is assumed to be both a public and a personal behavioral guide (Bentham, 1789). It can be defined as an excessive and obsessive preoccupation of consumption and accumulation of consumables. It is perhaps the most critical factor in natural resource depletion, environmental degradation and climate change. The world of global markets is said to follow the sovereign commandments and dictates of the consumer king. It is the market mechanism which channelizes the signals received from the prospective allured customers regarding 'What to produce? Why to produce? For whom to produce? How to produce? How much to produce? How long to produce? And so?' to the profit maximizing producers. The market has a personality of its own. It has a fascination and fetish as well. It writes and underwrites the self-serving maxims of the utility which resides in commodities, consumables and storable as well. The more you have the more you are happy and vice versa is the utilitarian axiom. Conspicuous consumerism and corporatized market as well have less to do with usefulness and more to do with creation of commodity fetish and buying appetite. Consumerist persona is a product of utilitarian reduction of the '*man*' a whole into the '*economic man*' a compartment.

The cycle of utilitarian consumerism is twofold. On the one hand, it emerges from and vanishes into a Benthamite consumption function which is based upon:

- ♦ The ever enlarging matrix of sensual pain and pleasure;
- ♦ The concept of utility residing in material consumption alone; and
- ♦ The exclusion of all non-material forms of utility and satisfaction.

On the other, it calls for and actualizes an exchange-value (profit) based production function:

- ♦ Which is obsessively profit oriented;
- ♦ Which distributes commodities exclusively on the basis of purchasing power; and
- ♦ Which is non-sustainable.

There might be many social and psychological dimensions of discourses over consumerism. However we shall stick to the following economic repercussions of consumerism which have significant bearing on environmental degradation and climate change:

- ♦ Conspicuous consumption cycle and externalities;
- ♦ Consumer and consumption wastage;
- ♦ Commodity inventions and need enlargement.
- ♦ Creation of status symbols and life styles;
- ♦ Production disarticulation; and
- ♦ Persistence of poverty.

Consumerism has been described variously by the people belonging to different fields. It is like *narcissist* consumer self which is false and void; it arises out of distortion of authentic human needs and desires (Kanner and Gomes, 1995). Consumerism creates an addiction of ever increasing wealth like that created by drugs (Wachtel, 1989). It also creates an illusion of 'prosperity and prestige' centered around the exchange value as a commodity's capacity to confer prestige (Lasch, 1979: 72). Consumerism has been considered as an economic imperative for employment and growth in the affluent first world (McKibben, 1989; Suzuki, 1997; Cohen, 2003).

### **CONSUMERIST EXTERNALITIES**

Consumerism has obviously perceived causative association with atmospheric and climatic compositional variation. At a time when the Earth planet is most populated in terms of human demography, the provision of basic needs itself takes on critical enough burden on nature. The phenomena of ever increasing product innovation and need enlargement required by conspicuously evolving life styles and status symbols takes heavy tolls on ecological and economic sustainability. Resource depletion and environmental degradation are directly linked to consumerism (Brower and Leon, 1999; Brown, 2001; Gardener and Stern, 2002).

Excessive consumption and accumulation obsession and the resultant production implications are heavily responsible for chlorofluorocarbons, and greenhouse emissions. See, for example, energy and light saving low cost old housing structures are being fast replaced by highly energy dependent box types and closed air conditioned dwellings. The households overflow in terms of refrigerating, cooling, warming and electronic configurations and modern state of art gadgets and home appliances. Transport assumes personalized form of travel vehicles with temperature control devices. Frequently usable carry bags vanish substituted by synthetic polythene and plastic envelopes and other non-degradable packaging

materials. Environment unfriendly transformations and production processes go on accumulating infinitely. The cumulative imbalance in atmospheric composition is said to be auto-adjusted by nature in the form of sudden, unexpected explosions of cold waves, heat waves, ice storms, rain storms, oceanic rage storms, platonic adjustments etc. here and there, now and then.

Consumerism and climate interplay matrix can be simplified and represented in a schematic way, as given in diagram 1, ahead.

**DIAGRAM 1: FROM CONSUMERISM TO CLIMATE CATASTROPHE**

<b>Voluntary Renunciation</b> ⇨ <b>Minimization of A =&gt; Z</b>	⇨ <b>D</b> <b>Wastage, Pollution and Emissions</b>	⇨ <b>E</b> <b>Environment's Auto-Absorption and Adjustment Capacity</b>
<b>A</b> <b>Consumerism</b> ⇨ [Conspicuous Consumption and Life Style] ⇨ ⇨ ⇨	⇨ <b>B</b> <b>Production</b> ⇨ ⇨	⇨ <b>C</b> <b>Resource Use</b>
	⇨ <b>E- D</b>	⇨ <b>F</b> <b>Resource Depletion - Replenishment = Replenishment Gap</b>
	⇨ <b>F</b>	⇨ <b>Changes In Environment, Ecology and Atmosphere</b>
	⇨ <b>Climate Change</b> ⇨ <b>Disasters</b> ⇨ <b>Ecological Non-Sustainability</b>	⇨ <b>Deadweight Loss =&gt; Resource Non-Sustainability</b>
⇨ <b>G</b> <b>Inequity in Resource Distribution</b>	⇨ <b>H</b> ⇨ <b>Poverty, penury</b> ⇨ <b>Consumerism</b> ⇨ <b>Environmental Damage</b>	

When a comparison is made between basic needs and natural comforts on one hand, and the status and life style luxuries on the other, it becomes more than obvious that the latter are critically ecology unfriendly, insensitive and conducive of climatic variation and resultant large scale unprecedented hazards and disasters. Resource depletion, replenishment gaps and wastage or pollution levels in excess of nature's absorption capacity, are *dead weight deficit* indices in this regard.

**VOLUNTARY RENUNCIATION**

Non-sustainability of economic, ecological and climatic conditions becomes a big threat for future existence of mankind. It has become imperative that the present human generations take corrective steps. As for as consumerism is concerned as a causative variable there is strong need for reduction in consumption forms which are:

- ♦ In excess of essential requirements;

- ♦ In contravention of public health and morality;
- ♦ Based on obsession (lust), rather than the needs;
- ♦ Boastful of status symbol-ism and life style-ism;
- ♦ Harmful to ecology, environment and sustainability; and
- ♦ Leading to miserable exclusion of weaker people.

Reduction in *consumerist consumption* can be brought about either by a dictator commandment or by voluntary austerity, simplicity and renunciation enabled by enhanced consciousness and self-consciousness. Alternatively consumption levels will positively go down due to nature's resultant inability to meet the same. The latter logic resembles somehow with Malthus' line of reasoning with respect to temporal increments in human population and means of survival subsistence. He was a pessimist "against the perfectibility of the mass of mankind"(Malthus, 1798: 199). He was proved wrong on his account of population growth because of increased consciousness and cost of living and rearing. He was said to have erred in non-estimation of technical change and progress in increasing the supply of means of survival. But he is still right. His logic stands appropriately proved. Technical progress has come on a stage directly in confrontation with existential sustainability; and survival needs of more than 7,000,000,000 (seven billion) people are at stakes. Future is understood to be besieged by ecological and economic disasters. What is required is an emergent initiation of sustainable technologies and production processes associated by holistic consciousness on consumption, spending and life style fronts.

Voluntary renunciation(Etzioni, 1999) basically emerges from respect and regard for sustainable coexistence of man and nature. It has many dimensions right from austerity measures to renunciation of '*will*' to have '*will*', through a long series of voluntary downshifting, simplicity, renunciation of life style, *wantlessness* and initiation of *spiritual utilities*.

Austerity refers to conscious, considered and calculated engagement with income-expenditure and production-consumption behavior. It is the prudent conduct of household to avoid wastage and loss. However it is not any far away from the utilitarian ethos. Austerity is different from voluntary reduction of consumption, which is directly associated with physical decrease in consumption mass of consumables. Voluntary restraints most easily take place in the form of downshifting of consumption levels with weak preferences. Voluntary simplicity may also assume strong preference for simplicity motivating substantial decrease in personal consumption basket. One version of simplicity, called 'status inversion' (Brooks, 1997)directs the consumptions rather from artifacts to comforts aspect of consumables.



Strong simplifier preference is instanced in high income people opting for simple and natural way of living in the serenity of country sides, leaving their high profile profession and personal life.

Forms of austerity and simplicity might emerge out of many motivations. Economic and physical hardships may make levels of consumption inaccessible and infeasible. It may also be the result of acquired fatigue of consumerism. If so the psychological void and vacuum created by renunciation may become a frustrating compulsion for come back to square one that is the consumerist cycle and commodity fetish (Scitovsky, 1992). However, voluntary renunciation is an internal response assimilated via global consciousness of the self in existential universe. It is more a realization of the meaning of life, its experience, and its existence (Elgin, 1993). It is an absoluteness and abstractness. Voluntary simplicity and renunciation have much to do with income levels also. In the case of institutionalization of renunciation among the affluent class and high income groups a lot of economic welfare can be achieved for a society. Degrees of inequity, poverty, misery, production dislocation etc. can be minimized significantly through voluntary renunciation. Value of voluntary renunciation can be actualized relatively easily when utilitarian framework is reformulated beyond personal pain and pleasure to include respect of social, and of natural as well, sentiments and interdependence encircling humanity and ecological community as a whole. Such a frame of reference could be found in most of the Semitic and Asiatic modes of enlightened consciousness. Pre-Newtonian world is frequently abundant of literature, people and societies substantially subscribing to the wisdom of voluntary austerity, simplicity, altruism and renunciation.

If we can somehow be able to, sieve the chaff out of grain, and look into what is real and pure within the convents of Rabbis, Bhikshus and Sufi saints, their codes of conduct, and their teachings as practiced by them, our wisdom of economic world will improve a lot to internalize the imperative of being a traveler in the temporal flow of universal existence.

Asiatic mode of voluntary renunciation rests upon an excellent philosophy. Pain and pleasure are nothing but the out of proportion expressions of instincts, needs, wishes or desires. These are frustrations of a too much expectationist mindset. Once one gets rid of excessiveness, obsessiveness, and expectations she is out of the fear and lust framework. Renunciation of consumer obsessions transforms the meaning and matrix of material utilitarianism. Had it not been for Brahmanic jugglery Mahatma Buddha's lesson of absolute renunciation of peripheral artifacts of human life might have become a great principle of sustainable existence, including economic sustainability? This renunciationist philosophy was

summarily phrased up as *wantlessness* by late J. K. Mehta (1962). Wantlessness is neither the end of need fulfillment nor the demise of economic progress. Rather it is the feeling of *abundant satiety in the absence of abundance* of commodities. In the context of Western consumerism it translates into absence of and check on need enlargement and commodity fetish.

#### **BIBLIOGRAPHY AND REFERENCES:**

- Bentham, J. (1789). *An Introduction to the Principles of Morals and Legislation*. Excerpts as quoted in S. G. Medema & W. J. Samuels (2003). *The History of Economic Thought: A Reader*. New York: Routledge. pp. 183-85.
- Bhattacharya, R. N. (2001). *Environmental Economics: An Indian Perspective*. (ed). New Delhi: Oxford University press.
- Brooks, D. (1997, December 30, 1996- January 6, 1997). *The liberal Gentry*. p. 24.
- Brower, M. & Leon, W. (1999). *The Consumer's Guide to Effective Environmental Choices: Practical Advice from the Union of Concerned Scientists*. New York: ThreeRivers Press.
- Brown, L. R. (2001). *Eco-Economy: Building an Economy for the Earth*. New York: W W Norton & Company.
- Brundtland Commission, (1987). *Report of The World Commission on Environment and Development: Our Common Future*. UNDP.
- Cohen, L. (2003). *A Consumer's Republic: The Politics of Mass Consumption in Postwar America*. New York: Vintage Books.
- Elgin, D. (1993). *Voluntary Simplicity*. New York: William Morrow.
- Emerald, N. D. (2004, Nov.). *Consumerism, Nature, and The Human Spirit*. USA: Virginia Polytechnic Institute and State University. <http://scholar.lib.vt.edu/theses/available/etd-12272004-133514>.
- Etzioni, A. (1999). *Essays in Socio-Economics*. Berlin: Springer.
- Gardener, G. & Stern P. (2002). *Environmental Problems and Human Behavior*. Boston: Pearson Custom Publishing. as quoted in Emerald, N. D. (2004, Nov.). *Consumerism, Nature, and The Human Spirit*. USA: Virginia Polytechnic Institute and State University. <http://scholar.lib.vt.edu/theses/available/etd-12272004-133514>.
- Gardener, G., Assadourin, G. & Sarin R. (2004). *The State Of Consumption Today*, In L. Starke (ed) *State of the World 2004*. New York: W.W. Norton & Company. as quoted in Emerald, N. D. (2004, Nov.). *Consumerism, Nature, and The Human Spirit*. USA: Virginia Polytechnic Institute and State University. <http://scholar.lib.vt.edu/theses/available/etd-12272004-133514>.
- Kanner, A. D. & Gomes, M. E. (1995). *The All-Consuming Self; in T. Roszak, M. E. Gomes, & A. D. Kanner (eds), Ecopsychology: Restoring The Earth - Healing The Mind*. San Francisco: Sierra Club Books.
- Lasch, C. (1979). *The Culture of Narcissism: American Life in an Age of Diminishing Expectations*. New York: W. W. Norton & Company. as quoted in Emerald, N. D. (2004, Nov.). *Consumerism, Nature, and The Human Spirit*. USA: Virginia Polytechnic Institute and State University. pp.12. <http://scholar.lib.vt.edu/theses/available/etd-12272004-133514>.
- Malthus, T. R. (1798). *An Essay on The Principles of Population*. London: Johnson. Excerpts as quoted in S G. Medema & W. J. Samuels (2003). *The History of Economic Thought: A Reader*. New York. Routledge. pp. 196-207.

- McKibben, B. (1989). *The End of Nature*. New York: Anchor Books. as quoted in Emerald, N. D. (2004, Nov.). Consumerism, Nature, and The Human Spirit. USA: Virginia Polytechnic Institute and State University. <http://scholar.lib.vt.edu/theses/available/etd-12272004-133514>.
- Mehta, J. K. (1962). *A Philosophical Interpretation of Economics*. London: George Allen and Unwin.
- Ricardo, David (2006). *The Principles of Political Economy and Taxation*; [copy of third edition (1821) Everyman Library edition, published by J M Dent in 1911]. London. [www.elecbook.com](http://www.elecbook.com).
- Rostow, W. W. (1991). *The Stages of Growth: A Non-Communist Manifesto*. London: Cambridge University Press.
- Scitovsky, T. (1992). *The Joyless economy: The Psychology of Human Satisfaction*. New York: Oxford University Press.
- Suzuki, D. (1997). *The Sacred Balance: Rediscovering Our Role in Nature*. Vancouver: Greystone Books. as quoted in Emerald, N. D. (2004, Nov.). Consumerism, Nature, and The Human Spirit. USA: Virginia Polytechnic Institute and State University. <http://scholar.lib.vt.edu/theses/available/etd-12272004-133514>.
- Wachtel, P. L. (1989). *Thr Poverty of Affluence*. Philadelphia: New Society Publisher. as quoted in Emerald, N. D. (2004, Nov.). Consumerism, Nature, and The Human Spirit. USA: Virginia Polytechnic Institute and State University. <http://scholar.lib.vt.edu/theses/available/etd-12272004-133514>.

## ENDNOTES

i

<sup>ii</sup>As reported by Kanner (1995: p. 77-78) it was the response of American President George Bush to the volunteers and other environmentalists at Rio de Janeiro, Brazil at the occasion of the Earth Summit in 1992, when they requested him to do something to bring down US levels of per capita consumption as America leads the world in per capita material consumption. As quoted, pp.24, in Emerald, N. D. (2004, Nov.). Consumerism, Nature, and The Human Spirit. USA: Virginia Polytechnic Institute and State University. <http://scholar.lib.vt.edu/theses/available/etd-12272004-133514>.

<sup>iii</sup> The report of the World Commission on Environment and Development (1987) put forward a hope that “Humanity has the ability to make development sustainable to ensure that it meets the needs of the present without compromising the ability of future generations to meet their needs” (p. 16). It asserted that “the environment does not exist as a sphere separate from human actions, ambitions, and needs... But the “environment” is where we live; and “development” is what we do in attempting to improve our lot within that abode. The two are inseparable” (p. 7).

<sup>iv</sup> David Ricardo had propounded the idea of rent as an answer to the problem of distribution. There was a debate on the impact of free trade in food grains on British corn prices and landlords’ rent earnings. It is in this context that while emulating Smith’s *laissez faire* he also argued for a free trade in food grains so that wage rate of labor could be kept at low subsistence rate thereby widening scope for capitalist share of profits out of total profits which in case of high corn prices would have gone to the landlords because of nature’s *scantiness* in provision of competent land area and other resources!

<sup>v</sup> Malthus was very apprehensive of two things: one, of the perfectibility of humankind and two, of the fixed space on nature’s table for the human guests. His parable is a denial of welcome to *unwanted* guests (the unwarranted increase in population of the economically incompetent human beings) in the household of nature because the nature’s means have a very low pace of movement in arithmetic proportions while man has the power to multiply its number many fold in the same duration.