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NOOCLASTIC THREATS:
Beyond intraspecific war
an introduction

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EXECUTIVE SUMMARY

NOOCLASTIC THREATS: Beyond intraspecific war.
an introduction

War is the most intense, ample, disrupting and costly form of violent conflict.

The main meaning of the term "war" is "intraspecific war" as in humans-against-humans.

Nevertheless, when the stakes are really high, in terms of human lives or social disruption potential, professional military intervention is requested. Militaries can be used as "tools" in circumstances that go beyond the "classical" intraspecific war scenario: a nation state (or a military coalition) fighting against another nation state (or another military coalition).

Currently militaries are not trained and prepared to operate against "Risks to civilization, humans and planet Earth" that do not entail the existence of a "traditional" enemy.

Some people, indeed scholars and futurists, already studied these risks, and evaluated the possibilities and the means of helping present and / or future humanity. In these studies militaries are usually considered as "weapon keepers", not as starring contributors.

What is military point of view ? Shall there be a future need (and: shall there be the possibility) for successful military intervention ? Against what threat(s) ?

According to the old and honored military maxim "divide et impera" (divide and rule) the collection of research papers is based on a taxonomic scheme, a classification that allowed some young Italian Ministry of Defence's officers (Lieutenants and Captains) to contribute their "research tiles" to a mosaic-view research (see: Chapter 10 scheme), aimed at gathering some preplanning intelligence on these interesting issues.

This paper provides an introduction to "existential risks", military point of view on "threats" and a frame to multiple research "tiles" that are of strategic relevance.
Intraspecific war, and beyond.

War is the most intense, ample, disrupting and costly form of violent conflict. During wars extremely aggressive behaviour is exhibited among organized groups. At least one group acts as if trying to dominate the other(s) or to alter domination hierarchies.

War is considered a typical human-against-human behaviour, but other primate species (and, of course, ants) are known to wage intra-specific "wars" in which members of the same species vie for the same limited resource, or for domination.

Intra-specific competition is nominally different from inter-specific competition, in which different species show aggressive behaviour and fight. Both forms of conflict can aim to the physical, violent, destruction of the enemy's ability to dominate. In these cases of extreme and socially organized competition the term "war" seems appropriate too.

The main meaning of the term "war" is "intraspecific war" as in humans-against-humans, (or ants-against-ants) and as such, since we are obviously more interested in our fellow humans' behaviour than - say - ants', the term "war" has assumed the connotation of a tipically human affair.

"Polemology" is the term indicating the study of human warfare and connected social and political issues, from a military point of view.

1 http://en.wikipedia.org/wiki/War
2 http://en.wikipedia.org/wiki/Violence
3 http://en.wikipedia.org/wiki/Conflict
4 http://en.wikipedia.org/wiki/Intraspecific_competition
5 http://en.wikipedia.org/wiki/Interspecific_competition
Interspecific destructive competition, as in humans-against-microbes, can be a social, organized, intense, ample, costly form of conflict too. In these cases the term "war", (meaning " inter-specific war ") seems completely appropriate, as in: "war against smallpox"\(^6\).

In layman's terms, sometimes, a concerted effort or campaign against something considered harmful, or an active antagonism is also considered as a war. From a military point of view this is a "stretching-the-meaning" attitude, since:

- in the so called "war against acid rain" case:
  The lack of an enemy capable of intentional action, implies the absence of two important adversarial cornerstones of war: strategy\(^7\) and tactics\(^8\). What remains is logistics\(^9\).

- in the so called "price war " case:
  Nobody is using real weapons\(^10\), and no real battles\(^11\) are fought.

Nevertheless, when the stakes are really high, in terms of human lives or social disruption potential, professional military intervention is requested to mitigate the consequences of meteorological disasters, or to enforce quarantines, or to provide humanitarian assistance and disaster relief, excluding the possibility of an enemy capable of intentional action (an earthquake, or a flood) and usually a priori excluding the use of weapons beyond law enforcement\(^12\) activities.

These are cases of MOOTW ( = Military Operations Other Than War\(^13\) ).

Militaries can be used as tools in circumstances that go beyond the "classical" intraspecific war scenario: a nation state\(^14\) (or a military coalition\(^15\)) fighting against another nation state (or another military coalition) to settle human-origined disputes.

\(^6\) http://en.wikipedia.org/wiki/Smallpox
\(^7\) http://en.wikipedia.org/wiki/Strategy
\(^8\) http://en.wikipedia.org/wiki/Military_tactics
\(^9\) http://en.wikipedia.org/wiki/Logistics
\(^10\) http://en.wikipedia.org/wiki/Weapon
\(^11\) http://en.wikipedia.org/wiki/Battle
\(^12\) http://en.wikipedia.org/wiki/Outline_of_law_enforcement
\(^13\) http://en.wikipedia.org/wiki/Operations_Other_Than_War
\(^14\) http://en.wikipedia.org/wiki/Nation_state
\(^15\) http://en.wikipedia.org/wiki/Coalition#Military
Nooclastic Threats

Militaries\textsuperscript{16} routinely drill to be able to stand crises\textsuperscript{17}, and train themselves to operate in dire contingencies.

Referring to potential future damages which must be limited by suitable preemptive actions, the key words in engineering terminology are: risk\textsuperscript{18}, hazard\textsuperscript{19} and probability\textsuperscript{20}.

In military preparation more emphasis is put on vulnerability\textsuperscript{21} and threat:

\begin{quote}
\textbf{Threat identification and assessment} \\

The Joint Operation Planning and Execution System function that provides: timely warning of potential threats to US interests; intelligence collection requirements; the effects of environmental, physical, and health hazards, and cultural factors on friendly and enemy operations; and determines the enemy military posture and possible intentions.
\end{quote}

\hspace{1cm} Joint Publication 1-02 Department of Defense
\hspace{1cm} Dictionary of Military and Associated Terms
\hspace{1cm} 12 April 2001 (As amended Through 31 July 2010)
\hspace{1cm} http://www.dtic.mil/doctrine/new_pubs/jp1_02.pdf

where enemy posture is to be evaluated in terms of: intent, capacity, opportunity....

\textsuperscript{16} http://en.wikipedia.org/wiki/Militaries
\textsuperscript{17} http://en.wikipedia.org/wiki/Crisis
\textsuperscript{18} http://en.wikipedia.org/wiki/Risk\#Definitions_of_risk
\textsuperscript{19} http://en.wikipedia.org/wiki/Hazard
\textsuperscript{20} http://en.wikipedia.org/wiki/Probability
\textsuperscript{21} http://en.wikipedia.org/wiki/Vulnerability

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The biggest threats which militaries are "traditionally" prepared to confront with are intraspecific wars (see Chapter 1). Are there threats bigger than these biggest threats?

The short answer is: Yes.

They are called "Existential Risks" (see Chapter 3), or "doomsday events"\(^{22}\), or in more sober terms "Risks to civilization, humans and planet Earth"\(^{23}\).

Not all of them entail the existence of an enemy capable of intentional destructive action, but all of them could be so "wide" and have so far reaching consequences as to carry a terminal risk for humanity as a whole, being destructive to the noosphere\(^{24}\).

The term noo-clastic (from the word "noosphere" and the suffix "clastic", Ancient Greek: κλαστός (klastos) meaning “broken”, "destroyed") has been coined to specify these threats, as considered from a military point of view.

Currently militaries are not trained and prepared to operate against nooclastic threats.

Should they prepare? Shall there be a future need (and: shall there be the possibility) for successful military intervention against nooclastic threats? These are central questions.

According to the old and honored military maxim "divide et impera" (divide and rule\(^{25}\)) this research effort is based on a taxonomic\(^{26}\) scheme, a classification that allowed some young Italian Ministry of Defence's officers (Lieutenants and Captains) to contribute to this mosaic-view research, while killing two other birds with the same stone:

- performing Ce.Mi.S.S.: fostering role\(^{27}\) towards young Italian military researchers;

- having a finger on the pulse of those who will be high-ranking officers and perhaps strategic analysts when (and if) nooclastic threats will be a clear and present danger.

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\(^{27}\) [http://www.difesa.it/smd/casd/istituti+militari/cemiss](http://www.difesa.it/smd/casd/istituti+militari/cemiss) (in Italian language)
Risks to civilization, humans and planet Earth have been fascinating pop-culture themes since the ages of millenarianism$^{28}$ and till current times.

Serious scientific publications recently devoted special issues to the topic.

Image: Cover page of Scientific American's Special Issue: "the end"
http://www.scientificamerican.com/article.cfm?id=the-end
(Last Visit: 2010 Oct 19)

$^{28}$ http://en.wikipedia.org/wiki/Millenarianism
Others decided the time came to update a previous list of 20 "World's end" scenarios, adding 10 new ways to doom and gloom (now up to 30, and still counting):

According to several Authors, differing lists and classifications are available.

Risks can be classified by a wide range of factors: probability (calculated or guessed at); causative agent (human, natural, ...); consequences; forecast date; scope (personal, regional, global); intensity (endurable or terminal)
For the purposes of this research paper the last two will be developed, according to the structure laid out by Swedish philosopher Nick Bostrom in his paper:

**Existential Risks**

Analyzing Human Extinction Scenarios and Related Hazards

(available online: [http://www.nickbostrom.com/existential/risks.html](http://www.nickbostrom.com/existential/risks.html))

We can distinguish six qualitatively distinct types of risks based on their scope and intensity (figure 1). The third dimension, probability, can be superimposed on the two dimensions plotted in the figure. Other things equal, a risk is more serious if it has a substantial probability and if our actions can make that probability significantly greater or smaller.

![Figure 1. Six risk categories](http://en.wikipedia.org/wiki/Nick_Bostrom)

“Personal”, “local”, or “global” refer to the size of the population that is directly affected; a global risk is one that affects the whole of humankind (and our successors). “Endurable” vs. “terminal” indicates how intensely the target population would be affected. An endurable risk may cause great destruction, but one can either recover from the damage or find ways of coping with the fallout. In contrast, a terminal risk is one where the targets are either annihilated or irreversibly crippled in ways that radically reduce their potential to live the sort of life they aspire to. In the case of personal risks, for instance, a terminal outcome could for example be death, permanent severe brain injury, or a lifetime prison sentence. An example of a local terminal risk would be genocide leading to the annihilation of a people (this happened to several Indian nations). Permanent enslavement is another example.

### 1.2 Existential risks

In this paper we shall discuss risks of the sixth category, the one marked with an X. This is the category of global, terminal risks. I shall call these *existential risks.*
The following classification of nooclastic threats (see Chapter 2) is adopted in this research paper, following the lead of Nick Bostrom's Existential Risks classification (see Chapter 3).

Four super-categories are considered:

1. **Bangs** Sudden disasters. Intelligent life goes extinct.
2. **Crunches** Human life continues, though in some crippled form.
3. **Shrieks** What we may consider possible and desirable is forever lost.
4. **Whimpers** Almost complete disappearance of what we value.

Each of these super-categories contains a list of sub-categories (possible threats), including a catch-all subcategory named "something unforeseen" which refers to, unanticipated, new ways of destroying the noosphere.\(^{30}\)

Each of the subcategories is a specific and sometimes specialistic theme to be analyzed.

In this introductive paper a short glimpse is given to each subcategory, in order to provide a setting to more detailed individual research papers that compose the "mosaic-view" research report on nooclastic threats.

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<td>Repressive totalitarian global regime</td>
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<td><strong>Whimpers</strong></td>
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<tr>
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<tr>
<td>2</td>
<td>Killed by an extraterrestrial civilization</td>
</tr>
<tr>
<td>3</td>
<td>Something unforeseen</td>
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A Bang is a sudden global disaster.

The likely outcome of such an event could be the extinction of intelligent life.

**Bangs**

1. Deliberate misuse of nanotechnology
2. Nuclear Holocaust
3. We're living in a simulation and it gets shut down
4. Badly programmed superintelligence
5. Genetically engineered biological agent
6. Accidental misuse of nanotechnology (Gray goo)
7. Something unforeseen
8. Physics disasters
9. Naturally occurring disease
10. Asteroid or comet impact
11. Runaway global warming
Bang 1: Deliberate misuse of nanotechnology.

Nanotechnology, dealing with matter constructs of molecular size, may allow the creation of new materials, and new devices of unprecedented capabilities.

A seminal text on the nanotechnological revolution is "Engines of Creation", written in 1986 by K. Eric Drexler (available online and then updated in 2007).

In a mature form, molecular nanotechnology will enable the construction of bacterium-scale self-replicating robots that can feed on dirt or other organic matter.

Potential dangers were envisioned in "Engines of Creation" by author K. E. Drexler, Chapter 11: "Engines of destruction".

What effects on military and government capability and planning, considering the implications of arms races and unbalanced development, has been recently studied (among others) by CRN - Center for Responsible Nanotechnology.

The possible strategic implications of a deliberate misuse of nanotechnology have been studied by a "junior" Italian Air Force Officer: Capt. Matteo Tani, whose contribution to this mosaic-view research on nooclastic threats is a research paper sub-titled: "Deliberate Misuse of Nanotechnology", and asking a crucial question: "Who against who/what?".

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31 http://en.wikipedia.org/wiki/Nanotechnology
33 "Engines of Creation -The Coming Era of Nanotechnology" by K. Eric Drexler available online: http://e-drexler.com/d/06/00/EOC/EOC_Table_of_Contents.html
34 Engines of Creation 2.0: The Coming Era of Nanotechnology - Updated and Expanded http://www.wowio.com/users/product.asp?BookId=503
35 http://e-drexler.com/d/06/00/EOC/EOC_Chapter_11.html
36 http://www.crnano.org/study20.htm last visit 2010 Nov 02
37 http://www.crnano.org/about_us.htm last visit 2010 Nov 02
38 http://en.wikipedia.org/wiki/Italian_Air_Force
Bang 2: Nuclear Holocaust.

Nuclear Holocaust\textsuperscript{39} was a nightmare scenario, well known to everyone living during the years of so-called cold war\textsuperscript{40}. Is this still a threat?

"We cannot disinvent nuclear weapons" affirmed Sir Joseph Rotblat\textsuperscript{41}.

Are there new ways and/or new enemies that could use nuclear materials with destructive intentionality?

This has been studied by an Italian Carabinieri\textsuperscript{42} Officer: Capt. Alfonso Montagnese, whose contribution to this mosaic-view research on nooclastic threats is a research paper subtitled: "Nuclear Holocaust" pointing out the (successful) instruments used to prevent and counter the threat, and future possible role of the armed forces, with specific references to future activities of threat prevention and contrast.

\textsuperscript{39} http://en.wikipedia.org/wiki/Nuclear_holocaust
\textsuperscript{40} http://en.wikipedia.org/wiki/Cold_war
\textsuperscript{41} http://en.wikipedia.org/wiki/Joseph_Rotblat
\textsuperscript{42} http://en.wikipedia.org/wiki/Carabinieri
Bang 3: We are living in a simulation, and it gets shut down.

Reality is something that exists.

Or - does it not ?.

What about Virtual Reality ?

What about the evil demon hypotesys that compelled one of the most powerful thinkers of anytime, René Descartes, to determine that the only indubitable knowledge is that he is thinking (and,therefore, in some sense, exists) ?

This problematic "fragile" status of reality is known at least since 6th Century before CE, when Chinese philosopher Zhuangzi dreamt of being a butterfly and, after having woken up, he didn't know if he was Zhuangzi who had dreamt to be a butterfly, or a butterfly dreaming he was Zhuangzi.

Poetic it seemed, but not dangerous.

Nowadays we know that a simulated reality can be interrupted (or abused) by an act of the simulator, or by "others".

How could simulated entities (we?) protect their (our?) lives ?

This specific nooclastic threat has been studied by an Italian Air Force Officer: Capt. Diego Bolchini, whose contribution to this mosaic-view research on nooclastic threats is a research paper subtitled "The simulation Argument", seriously considering this difficult (hellish?) scenario.

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43 http://en.wikipedia.org/wiki/Reality
44 http://en.wikipedia.org/wiki/Virtual_reality
45 http://en.wikipedia.org/wiki/Cartesian_demon
46 http://en.wikipedia.org/wiki/Ren%C3%A9_Descartes
47 http://en.wikipedia.org/wiki/Chuang_Tzu
48 http://en.wikipedia.org/wiki/Italian_Air_Force
Bang 4:   Badly programmed superintelligence.

Superintelligence is an hypothetical Strong Artificial Intelligence that can outperform humans in intellectual tasks.

Should one of these Strong A.I.s be better than humans at programming computers, we (not "she" and not "it" ) could write a better version of ourselves, and then.... an intelligence chain-reaction would follow.

Humans could lose the primacy, and possibly the control of what happens in "their" (our) world.

Success in Strong AI could have arbitrarily large positive consequences, but failure in programming we as a human-friendly entity could also have arbitrarily large negative consequences.

Can we envision ways of building a friendly AI?

The Analysis and Design of Benevolent Goal Architectures is the subtitle of the seminal study: "Creating Friendly AI 1.0" by Eliezer S. Yudkowsky aiming at studying this threat and searching for technical solutions.

Should we consider superintelligence as an absolute threat, or could it be our best "countermeasure" against other nooclastic threats?

This latter, defensive use, seems also possible: " Artificial Intelligence as a Positive and Negative Factor in Global Risk "

51 [http://singinst.org/upload/CFAL.html](http://singinst.org/upload/CFAL.html) last visit 2010 Oct 02
Bang 5: Genetically engineered biological agent.

Genetically modified organisms\(^{54}\) and other forms of synthetic life\(^{55}\) could be engineered as bioweapons\(^{56}\).

Biological warfare\(^{57}\) has been practiced in antiquity, Middle ages, and recently.

American biologist J. Craig Venter\(^{58}\) demonstrated in 2010 the possibility of assembling a synthetic genome\(^{59}\).

Possible impacts of such technologies have been studied, even from "defense" perspective ("Bio Inspired Innovation and National Security\(^{60}\) - Center for Technology and National Security Policy - National Defense University\(^{61}\)).
Bang 6: Accidental misuse of Nanotechnology ("Gray Goo").

"Gray Goo" is the pop-culture name of a doomsday scenario caused by self-replicating nano-robots going astray and building endless copies of themselves using everything as "raw material", eating the whole environment.

The homeostatic resistance of biological ecologies to ecophagy and possible defenses have been studied. (Lifeboat Foundation's Special Report is available online: "Some limits to Global Ecophagy by Bivorous Nanoreplicators, with Public Policy Recommendations")

A broader view on Nanotechnology Misuse Challenges is provided on webpages of the Foresight Institute.

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63 http://en.wikipedia.org/wiki/Homeostatic
64 http://en.wikipedia.org/wiki/Ecophagy
65 http://lifeboat.com/ex/main last visit 2010 Nov 02
66 http://lifeboat.com/ex/global.ecophagy last visit 2010 Nov 02
67 http://www.foresight.org/updates/update26/Update26.3.html last visit 2010 Nov 02
68 http://www.foresight.org/ last visit 2010 Nov 02
Epistemology is "the branch of philosophy concerned with the nature and scope (limitations) of knowledge" ⁶⁹.

It allows knowledge about our ignorance ("known un-knowns"), and also ignorance of our ignorance: "unknown unknowns" ⁷⁰.

"... there are known knowns; there are things we know we know. We also know there are known unknowns; that is to say we know there are some things we do not know. But there are also unknown unknowns -- the ones we don't know we don't know. And if one looks throughout the history of our country and other free countries, it is the latter category that tend to be the difficult ones." ⁷¹

United States Secretary of Defense Donald H. Rumsfeld ⁷²
Bang 8: Physics disasters.

Experimental physics\textsuperscript{73} is a way to go beyond thought experiments and to confirm theories or,... to be surprised and observe how the world is differing from what we think it is.

Some of the hypotesized outcomes of physics experimentation might produce scary outcomes as: black holes\textsuperscript{74}, strangelets\textsuperscript{75} or a "vacuum metastability event"\textsuperscript{76},

Other methods to "Destroy Earth" have been described\textsuperscript{77}, and classified as scientifically laughable, or infeasible or too slow or "impossible at our current technological level".

\textsuperscript{73} http://en.wikipedia.org/wiki/Experimental\_physics
\textsuperscript{74} http://en.wikipedia.org/wiki/Black\_hole
\textsuperscript{75} http://en.wikipedia.org/wiki/Strangelet#Dangers
\textsuperscript{76} http://en.wikipedia.org/wiki/True\_vacuum
\textsuperscript{77} http://www.livescience.com/technology/destroy_earth_mp-1.html last visit 2010 Nov 02
Bang 9: Naturally occurring Disease.

A disease is a condition that affects the body causing dysfunction and/or death.

When a disease is infectious it can cause social problems at the population level (epidemiology) or at planetwide level (pandemics) as the Black Death did.

World Health Organization is the specialized agency of the United Nations acting on international public health (http://www.who.int/en/).

Military point of view is expressed by DARPA (Defense Advanced Research Project Agency) DSO (Defense Sciences Office) issuing a Strategic Thrust for accelerated manufacture of pharmaceuticals:

"the identity of many new biological threat agents are unlikely to be known in advance and therefore pre-emptive manufacturing and stockpiling of countermeasures cannot always be performed ... The Accelerated Manufacture of Pharmaceuticals (AMP) program seeks to produce bulk doses of vaccine quality recombinant protein and monoclonal therapies "on demand," and in large quantities against established and new biological threats. The goal of the program is to create an extremely rapid, flexible, and cost-effective production system"
Bang 10: Asteroid or Comet Impact.

"Millions of potential planet-killers lurk in the Kuiper belt, any one of which could be jostled from its orbit and sent plummeting toward the Earth at any time "

(Mike Treder - Is tomorrow the end?)

Since 1982 "the NASA Near-Earth Object Program Office was established at JPL to coordinate NASA-sponsored efforts to detect, track and characterize potentially hazardous asteroids and comets that could approach the Earth "

"The real issue on planetary defense is not <<weapons>>

it is "command and control" (c2):
- who identifies the threat?
- who believes that its real and why?
- who tells whom about the threat?
- who decides what to do?
- who builds and executes the operation?
- who pays?
- who coordinates with all the effected parties?
- who tests the mitigation method?
- who gets blamed when it goes wrong?"

(Planetary Defense: Near Earth Objects (NEOS) - available online: http://www.adrc.iastate.edu/fileadmin/www.adrc.iastate.edu/Presentations/Pete_Worden_pdf.pdf last visit 2010 Nov 02)

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87 http://en.wikipedia.org/wiki/Kuiper_belt
88 http://ieet.org/index.php/IEET/more/treder20090916/ last visit 2010 Nov 02
89 http://www.jpl.nasa.gov/asteroidwatch/overview.cfm last visit 2010 Nov 02
Bang 11: Runaway Global Warming\textsuperscript{90}.

Climate change\textsuperscript{91}, caused either by human activity ("anthropogenic"\textsuperscript{92}) or resulting from natural causes\textsuperscript{93} might be so outside of human control and so harmful that it can be classified as a disaster\textsuperscript{94}.

Current focus of attention is on runaway global warming, but some 40 years ago it was on global freezing\textsuperscript{95} ...

A shocking and horribly spooky event that, in Michael Anissimov's opinion, ruined the planet for millions of years, was the Azolla event\textsuperscript{96}. It demonstrates a real-life example of the power of self-replication with exponential growth potential, and runaway, non anthropic, climate change.

Nuclear winter\textsuperscript{97} is a predicted (secondary) climatic effect of nuclear war.

\textsuperscript{90} http://en.wikipedia.org/wiki/Global_warming
\textsuperscript{91} http://en.wikipedia.org/wiki/Climate_change
\textsuperscript{92} http://en.wikipedia.org/wiki/Anthropogenic
\textsuperscript{93} http://en.wikipedia.org/wiki/Act_of_God
\textsuperscript{94} http://en.wikipedia.org/wiki/Disaster
\textsuperscript{95} http://en.wikipedia.org/wiki/Global_freezing
\textsuperscript{96} http://en.wikipedia.org/wiki/Azolla_Event
\textsuperscript{97} http://en.wikipedia.org/wiki/Nuclear_winter
A Crunch is a global disaster. It is slower than a Bang.

The likely outcome could be that human life continues, but in some crippled form.

**Crunches**

1. Resource depletion or ecological destruction
2. Misguided world government stops technological progress
3. "Dysgenic" pressures
4. Technological arrest
5. Something unforeseen
Crunch 1: Resource depletion (or Ecological destruction).

Resource depletion\(^98\) can be conceived as the superlative of scarcity\(^99\) in a world of limited resources.

The production rate of a needed resource over time is approximated by the Hubbert Curve\(^100\), whose shape can be influenced by various factors.

What is important is to have a slow, controlled, decline (after the peak) so that there will be time enough to develop replacement sources, avoiding drastic impacts.

Ecological destruction can be conceived as the worst case scenario of environmental degradation\(^101\).

Environmental degradation is one of the "Ten Threats" officially cautioned by the High Level Threat Panel of the United Nations (Fifty-ninth session Follow-up to the outcome of the Millennium Summit - 2 Dec 2004\(^102\), in the document titled "A more secure world: our shared responsibility -Report of the High-level Panel on Threats, Challenges and Change").

\(^{100}\) http://en.wikipedia.org/wiki/Hubbert_curve
\(^{101}\) http://en.wikipedia.org/wiki/Environmental_degradation
\(^{102}\) http://www.un.org/secureworld/report.pdf last visit 2010 Nov 03

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Crunch 2: Misguided world government decides to stop technological progress.

Technology\textsuperscript{103}, since the invention of the wheel, is appreciated because it positively affects human life.

We are furthermore convinced that, in historical terms, there is a trend towards a betterment: progress\textsuperscript{104}.

There is room in logical space to resist the argument that unlimited technological progress has to be good, always, to everybody.

The literary form of dystopia\textsuperscript{105} (or anti utopia) has taken charge of that position.

Crunch 3: "Dysgenic" pressures.

"Dysgenics (also known as cacogenics) is the study of factors producing the accumulation and perpetuation of defective or disadvantageous genes and traits in offspring of a particular population or species."

\url{http://en.wikipedia.org/wiki/Dysgenic}
(last visit 2010 Nov 03)

\textsuperscript{103} \url{http://en.wikipedia.org/wiki/Technology}
\textsuperscript{104} \url{http://en.wikipedia.org/wiki/Progress}
\textsuperscript{105} \url{http://en.wikipedia.org/wiki/Dystopia}
Crunch 4: Technological arrest.

Some limits (the speed of light?) might be insurmountable.

Other technological achievements might require coordinated efforts beyond current human capabilities or resources, forcing a temporary delay or causing the missing of an unrepeatable opportunity.

On the reverse side of technological arrest it has to be cited the most extreme form of technology development\(^{106}\) leading not only to a quantitatively fast progress, but also to a qualitatively differing phenomenon of runaway accelerating change, and an intelligence explosion, implying a future event of technological singularity\(^{107}\).

American futurist and inventor Ray Kurzweil\(^{108}\) in his book "The Singularity Is Near: When Humans Transcend Biology"\(^{109}\) suggests that this intelligence explosion could be one of the most effective defenses against other existential risks, while others underline that such a technological singularity would be an essential unpredictability factor, constituting a forecasting\(^{110}\) horizon, which shall leave humans prey to "something unforeseen".

Crunch 5: Something Unforeseen.

(see: Something Unforeseen in Chapter 4)

\(^{106}\) http://en.wikipedia.org/wiki/Technological_development
\(^{107}\) http://en.wikipedia.org/wiki/Technological_singularity
\(^{108}\) http://en.wikipedia.org/wiki/Raymond_Kurzweil
\(^{109}\) http://en.wikipedia.org/wiki/The_Singularity_is_Near
\(^{110}\) http://en.wikipedia.org/wiki/Future#Forecasting
A Shrieck is a "slow" global disaster.

The feared outcome is that what we may consider possible and desirable is forever lost.

**Shriecks**

1. **Take-over by a transcending upload**
2. **Flawed superintelligence**
3. **Repressive totalitarian global regime**
4. **Something unforeseen**

An [existential risk](http://en.wikipedia.org/wiki/Value_system) can be envisioned that, according to some theories of [value](http://en.wikipedia.org/wiki/Value_system), may be considered a state of being that is even worse than non-existence or death.

Such state of being, of more-than-terminal intensity, has been labelled "hellish". (Global Catastrophic Risks, by Nick Bostrom & Milan Cirkovic, Oxford Univ. Press) Chapter 1 is available online: [http://www.global-catastrophic-risks.com/docs/global-catastrophic-risks.pdf](http://www.global-catastrophic-risks.com/docs/global-catastrophic-risks.pdf) last visit 2010 Nov 08 )
Shriek 1: Take-over by a transcending upload.

Scanning and mapping an entire brain, and uploading its state on a computational device is an hypothetical technology that is aimed at simulating a single mind (or entire populations), in a futuristic scenario that has both advocates and critics.

Theoretical benefits of uploaded minds (speedup, immortality / backup, multiple / parallel existences, ...) might be so huge as to consent transcendence beyond human limits.

Superhuman intelligences may have goals inconsistent with human survival and prosperity, de facto constituting a threat.

Shriek 2: Flawed Superintelligence.

Threat to traditional (biological) human beings lies in the "species dominance" issue ( "The Artilect war: a Bitter controversy concerning whether humanity should build Godlike Massively Intelligent Machines" by Hugo de Garis ).

\[\text{112} \text{http://en.wikipedia.org/wiki/Mind_uploading} \]
\[\text{113} \text{http://en.wikipedia.org/wiki/Mind_uploading#Theoretical_benefits} \]
\[\text{114} \text{http://en.wikipedia.org/wiki/Homo_sapiens} \]
\[\text{115} \text{http://www.amazon.com/Artilect-War-Controversy-Concerning-Intelligent/dp/0882801546} \]
Shriek 3: Repressive totalitarian global regime.

Totalitarianism[^116] is a well known threat. Repression[^117] and/or persecution[^118] are to be feared.

Some concerns arise from the possibility that some new technologies could act as involuntary "enablers" or "promotors" of such feared global regimes.

This specific nooclastic threat has been studied by an Italian Air Force[^119] Officer: Ten. Federica MICELLI, whose contribution to this mosaic-view research on nooclastic threats is the paper subtitled "Repressive Totalitarian Global Regime".

Shriek 4: Something Unforeseen.

(see: Something Unforeseen in Chapter 4)

A Whimper is a "very slow" global disaster.

The feared outcome is the almost complete disappearance of the things we value.

**Whimpers**

1. **Our potential or even our core values are eroded by evolutionary development**
2. **Killed by an extraterrestrial civilization**
3. **Something unforeseen**

**William Nelson Joy**[^120], co-founder of Sun Microsystems, is the American computer scientist that famously wrote "**Why the future doesn't need us**[^121,^122]", an article that in April 2000 argued that humanity might become one of the **endangered species**[^123].

Of course we value our "being alive", and this is the reason why we study nooclastic threats: humans will not accept without questioning that "human world" might be bound to disappear: here we are and **"Hic manebimus optime"**[^124]! (expressing human intent to keep human position even in adverse circumstances).

[^121]: [http://www.wired.com/wired/archive/8.04/joy_pr.html](http://www.wired.com/wired/archive/8.04/joy_pr.html) last visit 2010 Nov 09
Whimper 1: Our potential or even our core values are eroded by evolutionary development.

The future of human evolution\(^{125}\)

"...is sometimes thought of as exhibiting an inexorable trend towards higher, more complex, and normatively worthwhile forms of life" (Nick Bostrom - 2004).

Evolution\(^{126}\) might, instead, lead to the erosion of complexity or to the cultural disappearance of what we now consider a "core value".

Anthropogenic\(^{127}\) (man-made) threats could arise from some ill-conceived technological development, simply because "we" do not know for sure what will be best for our descendants, their culture, and their future environment.

"We", present time humans, might not be the best judges of what will be "valued" by far future generations. Nevertheless, since a core value\(^ {128}\) is a belief\(^ {129}\), we feel to have some right to act basing on what we, now, believe. Indeed ancestors might be wrong, as shown by some presently widely appreciated "disappearances" of once appreciated "values" such as: ancient deities\(^ {130}\); slavery; vendetta\(^ {131}\) (feud).


Whimper 2: Killed by an extraterrestrial civilization.

"Just imagine a high tech species descended from solitary stalking carnivores, like tigers, or loner infanticides, like bears, or pack carnivores, or paranoid herd herbivores, or mammoth harem-keepers like elephant seals. We come from tribes of long-lived, relatively patient....."132

(\textit{the other Kind of Aliens} by - David Brin)

* Thanks for the map! We're coming! *

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Whimper 3: Something Unforeseen.

(see: \textit{Something Unforeseen in Chapter 4})

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132 The Other Kind of Aliens - by David Brin \texttt{http://ieet.org/index.php/IEET/more/brin20100430} - last visit 2010 Nov 08
On the "safe side"

Ordinary technological development has, sometimes, caused harm to the people or to the environment. To prevent such harm the precautionary principle\(^{133}\) has been formulated and enacted. As a result emerging technologies\(^{134}\) are currently evaluated by experts in various disciplines, not only in order to maximize potential benefits but also to avoid feared risks, or minimize subsequent damages.

Is that enough? Disruptive technologies\(^{135}\) sometimes "happen", creating unexpected effects, that can only be studied "a posteriori\(^{136}\). Humanity has learnt some of the lessons that history gave, and many protections are now included in human genome, normative laws of conduct, our cultural infrastructures, and technologies.

Like other biological system of systems "we" are collectively a complex system that, now, shows great robustness to threats for which "we" were designed / selected / evolved. As a result surviving humanity is now more resilient, but we still have to fear threats that were not experienced during our history. Our vulnerability to unanticipated threats is extreme.

Learning from "experiment" has been a good idea: humanity survived past threats.

This cannot be done when considering Existential Risks: protective action against threats that are both global and terminal has to be strictly preemptive, and cannot be based on gaining experience from damage assessment, since there could be no possibility to "try again and do your best, next time".


This is the main reason why some people, indeed scholars and futurists, associated to study these risks, and evaluate the possibilities and the means of helping present and/or future humanity in remaining on the "safe side" of the path.

Among them (last visit: 2010 Nov 09):

The Singularity Institute for Artificial Intelligence, Inc.

http://singinst.org/

Center for Responsible Nanotechnology

http://www.crnano.org/

Lifeboat foundation

http://lifeboat.com/ex/main

The Foresight Institute

http://www.foresight.org/
Title: NOOCLASTIC THREATS: Beyond intraspecific war.  
(Ce.Mi.S.S. Research paper 2010 STEPI - T-1)

Frame and Tiles:

- an introduction (this paper) by Lt.Col. Volfango Monaci  
(STEPI - T-1 .0.0)

- Deliberate misuse of nanotechnology by Capt. Matteo Tani  
(STEPI - T-1 .1.1)

- Nuclear Holocaust by Capt. Alfonso Montagnese  
(STEPI - T-1 .1.2)

- The Simulation argument by Capt. Diego Bolchini  
(STEPI - T-1 .1.3)

- Repressive Totalitarian Global Regime by Ten. Federica Micelli  
(STEPI - T-1 .3.3)

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- Nick Bostrom's Homepage: http://www.nickbostrom.com/


- Journal of Evolution & Technology available online : http://jetpress.org/

- "Teilhard de Chardin and Transhumanism" by Eric Steinhart available online: http://jetpress.org/v20/steinhart.htm

- "Engines of Creation -The Coming Era of Nanotechnology" by K. Eric Drexler available online: http://e-drexler.com/d/06/00/EOC/EOC_Table_of_Contents.html

- Creating Friendly AI 1.0 - The Analysis and Design of Benevolent Goal Architectures by Eliezer S. Yudkowsky available online: http://singinst.org/upload/CFAI.html


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The content in the studies published thus reflects only the opinion of the researcher and not of the Italian Ministry of Defence.

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\textsuperscript{142} \url{http://it.wikipedia.org/wiki/Centro_Militare_di_Studi_Strategici}
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