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# **On the Problem of Sustainable Economic Development: A Theoretical Solution to this Prisoner's Dilemma**

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The Linnean Society of London

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# *On the Problem of Sustainable Economic Development I: The Funk-Zweikampf Solution to this Prisoner's Dilemma*

*Introducing a Unified Theory of Value for the Biological and Social Sciences  
in an Open Letter to the  
Åland International Institute of Comparative Island Studies<sup>1</sup>*

**... will hold. There are situations in economics or international politics in which, effectively, a group of interests are involved in a non-cooperative game without being aware of it; the non-awareness helping to make the situation truly non-cooperative.**

(John Nash, NON-COOPERATIVE GAMES, 1950)

*For my Mother, my Father, my Son, & my Wife!*

1 May 2008

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Matt Funk, *Naturalist*

Funk Island,<sup>2</sup> Vinland<sup>3</sup>

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1 AICIS... is an Åland based, international and *independent*, research institute which explores the economic and institutional aspects of insular entities - mainly from a comparative point of view. It operates, on a network basis, in close cooperation with other island institutes and academic institutions, as well as with a variety of economic and policy milieus, all over the world. AICIS.... is an independent foundation, set up by a number of leading Ålandic companies: Åland Mutual, Alandia Corporations, Bank of Åland, and Åland Investment Ltd. [italics mine AICIS 2008].

2 Funk Island..., 60 km east of Fogo Island off the northeast coast of Newfoundland, is home to more than one million common murres, numbers that make it the largest colony of common murre in the western North Atlantic....

As a seabird ecological reserve, Funk Island is now known for its ability to protect seabirds. This was not always the case. In previous centuries, Funk Island was one of the major nesting areas of the Great auk, and people came regularly to hunt the birds and take their eggs.... The Great auk—large, flightless birds—were eventually hunted to extinction.

*This loss shows how human activity can result in the extermination of a wildlife species.* Making Funk Island an ecological reserve has helped other seabird species recover from similar exploitation and near extirpation from the island....

At 5.2 km<sup>2</sup> (5 km<sup>2</sup> of which is the marine component), the reserve is the smallest seabird ecological reserve in Newfoundland and Labrador, but it's also one of the most important. To protect the nesting seabirds, only scientific research activities are allowed on the island [italics mine, Newfoundland & Labrador 2008].

3 We had come to believe that 'Vinland' had never existed as a precise geographical location in North America. The name itself—'Vinland the Good'—carries too many overtones of romance and fable: fables of the Hesperides, of the Fortunate Isles... 'Vinland the Good' smacks much more of a wistful and wishful concept than of a geographical reality. *To the Norse explorers, Vinland was always somewhere beyond the next horizon—tantalizingly near, but always just out of reach* [italics mine, Magnússon 2003, pp 125-126].

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## TOUCHSTONE<sup>1</sup>

Nothing is easier than to admit in words the truth of the universal *Struggle for Life*,<sup>2</sup> or more difficult—at least I have found it so—than constantly to bear this conclusion in mind. Yet unless it be thoroughly engrained in the mind, I am convinced that the whole economy of nature, with every fact on distribution, rarity, abundance, extinction, and variation, will be dimly seen or quite misunderstood. We behold the face of nature bright with gladness, we often see superabundance of food; we do not see, or we forget, that the birds which are idly singing round us mostly live on insects or seeds, and are thus constantly destroying life; or we forget how largely these songsters, or their eggs, or their nestlings, are destroyed by birds and beasts of prey; we do not always bear in mind, that though food may be now superabundant, it is not so at all seasons of each recurring year.

—Charles Darwin, *On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life*, 1859

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- 1 Every man carries about him a touchstone... to distinguish... truth from appearances [Locke 1706, as cited in Popper 1963, p 3].
  - 2 Our objective here is not to come up with a ponderous definition of war, but rather to capture its essence: *Zweikampf*, *The Struggle for Life*. War is actually nothing but a series of struggles. It may be most helpful to think of the countless struggles that make up war as a single unit, to imagine two wrestlers locked in a hold, each *struggling* to impose his will, to attack, to defend against counter-attack, to render his opponent incapable of further resistance, and, both generally and ultimately, to *Struggle for Life* [General Carl von Clausewitz, *Vom Kriege*, 1832. The author would like to thank Simone Stahel-Webster for her assistance with this English translation; naturally, any errors or omissions may be attributed singularly to the author.].

## ABSTRACT

This paper offers a solution to *The Problem of Sustainable Economic Development*, and a universal theory of value.<sup>1</sup> We introduce axioms which serve as the first of two independent derivations of our solution, and note our axioms falsify the central thesis of *ecological economics*. We introduce our methods, the genesis and evolution of our theory, field notes from Mustique, Iceland, and Prince Edward Island, and set the stage for a more thorough discourse, of which this paper represents the first of three segments. We demonstrate that *value* ( $V$ ) is a derivative function of *relative insularity* ( $I_R$ ):  $V = f'(I_R)$ , then model economic development by dividing the world into geo-political islands:  $P_1$ : *Relatively Insular States* (RIS), and  $P_2$ : *Global Economic Military Superpowers* (GEMS). Our axioms deduce two dominant development strategies:  $S_1$ : *Maximum Economic Development*, and  $S_2$ : *Maximum Ecological Preservation*. We clarify this by applying our *Theory of Value* within geo-political contexts which reveal divergent, optimizing strategies for GEMS and RIS economic development. We discover pure GEMS (i.e. low  $I_R$ ) and pure RIS (i.e. high  $I_R$ ) strategies are antithetical, yet also discover these naturally opposing strategies represent the most tenable, rational solution-set possible. In light of the inherent and inescapable human and planetary uncertainties our axiom reveal, we discover the optimal RIS strategy =  $S_2$  and GEMS =  $S_1$ . We note our solution represents the Prisoner's Dilemma. We also note, that, *ceteris paribus*, based upon revealed 20<sup>th</sup> and 21<sup>st</sup> century preferences, RIS strategy has been sub-optimal/irrational ( $S_1$ ). Strategic Equilibrium/ESS<sup>2</sup> is attained when players pursue respective rational, opposing development strategies. Equilibrium, however, offers windfalls: surplus value is created (RIS-driven ecological preservation, and GEMS-driven *Global Security* and *Planetary Protection*). In essence, this non-cooperative, strategic equilibrium paves the way for rational, mutually beneficial, cooperative behaviour, and yields surplus ecological and planetary insularities, and thus surplus economic and biologic value: RIS cooperate, form coalitions, and struggle for greater *ecological insularity* (ecological preservation). At the same time, GEMS fight for economic development and *planetary insularity* (planetary preservation, i.e. financing national and global defence, extraterrestrial exploration, and searching for solutions to mission-critical, extra-planetary threats to human existence). Surplus value is maximized through strategic transparency: *If* all players recognize the value of respective, opposing, and antithetical, rational strategies, *then* all players negotiate more rationally, efficiently, and peacefully. We refer to our solution based upon two opposing, rational strategies as *The Funk-Zweikampf Solution*.<sup>3</sup> Moreover, we demonstrate our solution is as powerful at local and individual levels as it is at the national level, including its use as a tool for strategic decision-making under uncertainty and variable insularity. Furthermore, our *Theory of Value* illuminates an entrenched, systemic, strategic RIS error which reflects the false application of widely misunderstood economic principles, and fundamental constitutional defects<sup>4</sup> which promote *The Tragedy of the Commons*.<sup>5</sup> We detail the role of relative insularity, the principles of rational pure RIS development strategy, and cite Åland, Iceland, and Japan as ideal island models for RIS/GEMS mixed-strategies. Our theory also suggests that it is no coincidence that the island which best exhibits optimal pure RIS economic development strategy ( $S_2$ ) is not a *democratic nation*, but rather the uniquely independent, autonomous, privately-controlled island of Mustique. All RIS, however, may optimize with our counter-intuitive solution through individual, regional, and state coalitions. Furthermore, our *Theory of Value* promotes self-organization, constitutional amendment, self-sufficiency, independence, and thus places stones along the illusive path to a tenable solution to *The Problem of Sustainable Development*.

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1 See ABBREVIATIONS & DEFINITIONS: *Theory of Value*.

2 See ABBREVIATIONS & DEFINITIONS: *Equilibrium, Strategic Equilibrium, & Evolutionary Stable Strategy*

3 See ABBREVIATIONS & DEFINITIONS: *Funk-Zweikampf Solution*

4 Is there a greater tragedy imaginable than that, in our endeavour consciously to shape our future in accordance with high ideals, we should in fact unwittingly produce the very opposite of what we have been striving? (Hayek 1944, p4).

5 Lloyd 1833, Hardin 1968.

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1 May 2008

Dear Ålanders:

I love islands. But I do not love all islands equally, I do not love all islands unconditionally, and there are in fact countless islands which I don't even like, much less love.

I love the islands of the Stockholm archipelago, Amager, Zealand, the Faroe Islands, Île aux Coudres, St. Pierre & Miquelon, Newfoundland, Fogo, Anticosti Island, Mackinack Island, the islands of Wisconsin's Northern Highland District,<sup>1</sup> Chiloe, Lanai, St. John, St. Lucia, Necker, and Puerto Rico—but I am not so fond of Key West.

Yes, I love some islands, don't care for others, and many of the islands I do love are not typically considered islands,<sup>2</sup> such as the island-like Canadian province of Quebec, the U.S. state of Alaska, Patagonia, Gibraltar, the land-locked nations of Switzerland, Lichtenstein, Austria, and Andorra, the city of Vancouver, the pedestrian village of Zermatt, the Gaspé and Kamchatka peninsulas,<sup>3</sup> Great Slave Lake,<sup>4</sup> the Engadin and Coachella valleys, a mile-long stretch of undeveloped shoreline along Lake Gogebic, Yellowstone National Park, Katmai National Park, the Naknek River, Norway, the Himalayas, the Pacific basin,<sup>5</sup> and the Alpine Convention Region.<sup>1</sup>

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1 See Brock & Carpenter 2007.

2 See ABBREVIATIONS & DEFINITIONS: *Island*

3 Nobody knew until 1991 that the Kamchatka region possesses the highest concentration of brown bears in the world. One of the reasons it stayed a secret: A nearby Russian deep-water submarine base prevented entry anywhere near the area....

Some fisheries biologists believe that the Kamchatka Peninsula represents the birthplace of 70 percent of the world's salmon population (Kelly 2008, p 33).

4 Great Slave Lake is massive, the 10<sup>th</sup> largest lake in the world, and forms part of the headwaters of the Mackenzie River. It lies smack in the middle of Canada's boreal forest, a 1.4 billion-acre swath of woods and waters that mantles northern America like a green crown, from Newfoundland all the way to the Yukon. "*The boreal,*" as it is known, is one of the planet's last healthy and whole landscapes. It holds a quarter of the planet's intact forests and freshwater resources [italics mine, Nickens 2008, p 83].

5 Many thousands of islands, totally more than one million square miles of land area, are strewn over the third of the earth's surface that comprises the Pacific basin. In no other ocean has it been easier for a bit of land to be entirely surrounded by water to become an island....

Any consideration of Pacific islands must begin with the immensity of the water area that surrounds them, the largest single earth feature, whose area is greater than all the land above sea level on the face of the globe (Thomas 1963, p 7).



Some of my favourite islands happen to be islands within islands, such as Lyford Cay, The Ocean Reef Club, the National Park on the north shore of Prince Edward Island—and the three cottages tucked within the borders of this national park on Hummingbird Lane—and thus, essentially, three islands within an island on an island!

But at the pinnacle, above all others, there is a very special class of islands which I love the most: Iceland, Greenland, Catalina Island, Vancouver Island, Skorpjos, a few small islands in Lake Zurich, many Micronesian islands, Unalaska, Kodiak Island, Baffin Island, Victoria Island, the Queen Elisabeth Islands, the equally noble Elisabeth Islands, Mago, Molokai, Niihau, the big island of Hawaii, the diminutive Entry Island, Tasmania, the Cook Islands, Niue, Forsythe Island, the south island of New Zealand, the entire island nation of Japan, the British Isles, the Azores,<sup>2</sup> San Marino, the Moonsund archipelago, Mustique, Lofoten, Gotland,<sup>3</sup> the Koster islands, Fårö, Ljusterö, Ekerö, Orust, and each and every one of the six thousand five hundred independent<sup>4</sup> Åland Islands.<sup>5</sup>

- 
- 1 AWARE that the Alps are one of the largest continuous unspoilt natural areas in Europe, which, with their outstanding unique and diverse natural habitat, culture and history, constitute an economic, cultural, recreational and living environment in the heart of Europe, shared by numerous peoples and countries, RECOGNIZING that the Alps constitute the living and economic environment for the indigenous population and are also vitally important for extra-Alpine regions, being the site of important transport routes, for example, RECOGNIZING the fact that the Alps constitute an essential habitat and last refuge for many endangered species of plants and animals AWARE of the substantial differences existing between national legal systems, natural conditions, population distribution, agriculture and forestry, the state and development of the economy, the volume of traffic and the nature and intensity of tourism, AWARE that the evergrowing pressures caused by man are increasingly threatening the Alpine region and its ecological functions, and that the damage is either irreparable or rectifiable only with great effort, at considerable cost and, as a rule, over a long period of time, CONVINCED of the need for economic interests to be reconciled with ecological requirements (Alpine Conference Ministers, 1989).
  - 2 "Not a beach destination or otherwise susceptible to mass tourism; indeed, its capricious climate probably impedes the flow of tourists. The islands' green volcanic mountains and picturesque black-and-white towns look set to remain unspoiled."  
"Wonderful place. Built environment in good shape. Locals are very sophisticated as most have lived overseas."  
"Remote and temperate, the Azores remain lightly touristed.... The ecosystem—from the beautiful hydrangea-covered hills of Flores to the rock-bottomed bays of Terceira—is in great shape" (Tourtellot 2008).
  - 3 Throughout the Viking Age, one historic island can claim to have been the true centre of the Viking world – the Baltic island of Gotland, off the east coast of Sweden. Although it is now a province of Sweden, it has always prided itself on its independence of view and action (Magnússon 1980, p 91).
  - 4 (a) Åland... is an unsuspecting place, a small province of neighbouring Finland. Home to 26,000 Swedish-speaking islanders, the island functions uniquely as an autonomous, self-governing, demilitarized region....  
'I don't define myself as Finnish or Swedish,' smiles Susanne Eriksson.... 'I am an Ålander' (Steen 2008, p1).  
(b) Åland functions... similar to an independent state with its own legislation and administration. Its health statistics are good. The average life expectancy is 2–3 years higher than in the rest of Finland. For women it is the highest in the Nordic countries... In 2003, the [per capita GDP] was €34 193 (£22 556, US\$44 423), the highest in the Nordic countries (Eriksson et. al. 2007, p 684).
  - 5 The Åland Islands (60°00' to 60°30'N, 19°30' to 20°30'E)... [are] situated on the SW coast of Finland in the northern Baltic Sea.... 6500 islands... forming a pattern of zonation ranging from inner sheltered bays to open sea areas. Average water depth is 20 to 25 m, with a shoreline of over 8000 km, emphasising [sic.] the importance of littoral, nearshore shallow areas for the functioning of the ecosystem.... The sea is non-tidal but influenced by strong seasonality in hydrography (Perus & Bonsdorff 2004, p 46).

And so I thank you for the opportunity to present this paper and my forthcoming seminar at your second annual conference, *Islands of Competence – Branding Identities in a Globalized World*. It will be a great privilege and honour to visit Åland and the Baltic Sea, which, do date, I have only been able to admire from afar.

Why do I love Åland?

Why do I love some islands and dislike others?

This is the story I would like to share with you.

It is the story of a small, wind-swept, desert island tucked in the far windward corner of the lesser Antilles, a story which began on a small, troubled island in the cold waters of the North Atlantic, sailed the Gulf Stream north to an island named Ísland, a story which, in turn, began long ago, on a small rural island in the vast green sea of the great American cornbelt.

In his 2001 *Sveriges Riksbank Prize* Lecture, Joseph Stiglitz recollected that

when I began the study of economics some forty one years ago, I was struck by the incongruity between the models that I was taught and the world that I had seen growing up, in Gary, Indiana, a city whose rise and fall paralleled the rise and fall of the industrial economy. Founded in 1906 by U.S. Steel, and named after its Chairman of the Board, by the end of the century it had declined to but a shadow of its former self. But even in its heyday, it was marred by poverty, periodic unemployment, and massive racial discrimination. Yet the theories that we were taught paid little attention to poverty, said that all markets cleared—including the labour market, so unemployment must be nothing more than a phantasm, and that the profit motive ensured that there could not be economic discrimination. If the central theorems that argued that the economy was Pareto efficient—that, in some sense, we were living in the best of all possible worlds—were true, *it seemed to me that we should be striving to create a different world.*<sup>1</sup>

In his *Sveriges Riksbank Prize* autobiography, Stiglitz elaborated on this theme, adding that

growing up in Gary Indiana gave me, I think, a distinct advantage over many of my classmates who had grown up in affluent suburbs. They could read articles that argued that in competitive equilibrium, there could not be discrimination, so long as there are some non-discriminatory individuals or firms, since it would pay any such firm to hire the lower wage discriminated-against individuals, and take them seriously. I *knew* that discrimination existed, even though there were many individuals who were not prejudiced. To me, the *theorem* simply proved that one or more of the assumptions that went into the theory was wrong; my task, as a theorist, was to figure out which assumptions were the critical ones.<sup>2</sup>

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1 Italics mine, p 473.

2 Italics Stiglitz's 2001.

Although I grew up in a small farm-town in the vast sea of the great American cornbelt, 41 miles due south of Gary on U.S. Highway 41, my Indiana was not nearly as instructional as Stiglitz's Indiana. But I have come to believe that islands, especially small islands with big problems, may offer even more distinct advantages than those offered by in Gary, Indiana.<sup>1</sup> I have come to believe there are distinct advantages of being an “outsider”<sup>2</sup> as well.

As fellow islanders, I imagine you are all well aware that islands are lighthouses—beacons far brighter, far more representative, and far more descriptive than mathematical models.<sup>3</sup> Although our island-based approach to economics employs a few mathematical tools, more often than not our approach to mathematics is in the *opposite direction*<sup>4</sup> commonly utilized in “continental” economic analysis.

Darwin's powerful and effective *island-based analysis* enabled us to break through *attendant myths*<sup>5</sup> and illusions and grasp global complexity and uncertainty that was beyond our reach. And “although it is often said that his *Origin*

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- 1 Islands are synecdoches: their understanding facilitates a ‘coming to grips’ with a more complex whole. They also act as advance indicators or extreme reproductions of what is future elsewhere. Crucial, new insights into evolutionary theory, and the realization of so much species differentiation on islands in modern zoogeography, are primarily due to the unwitting and haphazard stumbling of what, at first sight, may have appeared to be inconsequential, island-based, island-specific fieldwork. This includes such investigations as the study of Darwin's finches on the Galapagos Islands (Darwin 1859...) or Alfred Wallace's study of birds-of-paradise on the Aru Islands (Wallace, 1880)... The forays of Bronislaw Malinowski amongst the Trobriand (or Kiriwina) Islanders of Papua New Guinea (1922), Margaret Mead to Samoa and the Admiralty Islands (1928; 1934) and Raymond Firth to Tikopia (1936) led to the birth of ethnography (Baldacchino 2007b, p 9).
  - 2 *It is often outsiders who see a problem first.* This may be because an inventor is rightly keen to have his invention applied, and may therefore overlook its possibly undesirable consequences. Thus, certain chemical inventions proved very successful against mosquitoes and other insects, but with the undesirable result that songbirds died of starvation. The American naturalist Rachel Carson reported all this in her excellent book *Silent Spring* (Popper 1999, p 101).
  - 3 (a) Mathematicians may flatter themselves that they possess new ideas which mere human language is as yet unable to express. Let them make the effort to express these ideas in appropriate words without the aid of symbols, and if they succeed, they will not only lay us laymen under a lasting obligation, but, we venture to say, they will find themselves very much enlightened during the process, and will even be doubtful whether the ideas as expressed in symbols had ever quite found their way out of the equations into their minds (Maxwell 1873, p 400).  
(b) Civilization advances by extending the number of important operations which we can perform without thinking about them. This is of profound significance in the social field. We make constant use of formulas, symbols, and rules whose meaning we do not understand and through the use of which we avail ourselves of the assistance of knowledge which individually we do not possess. We have developed these practices and institutions by building upon habits and institutions which have proved successful in their own sphere and which have in turn become the foundation of the civilization we have built up (Hayek 1945, pp 519-530).
  - 4 Mathematics is a study which, when we start from its most familiar portions, may be pursued in either of two opposite directions. The more familiar direction is constructive, towards gradually increasing complexity : from integers to fractions, real numbers, complex numbers ; from addition and multiplication to differentiation and integration, and on to higher mathematics. The other direction, which is less familiar, proceeds, by analysing, to greater and greater abstractness and logical simplicity ; instead of asking what can be defined and deduced from what is assumed to begin with, we ask instead what more general ideas and principles can be found, in terms of which what was our starting-point can be defined or deduced (Russell 1919, pp1-2).
  - 5 See ABBREVIATIONS & DEFINITIONS: *Myths*

convinced people of evolution because it provided an easily-understood mechanism (natural selection) for evolution, the deluge of articles and books published in 1909, 50 years after the origin, show clearly that *it was principally the facts of geographical distribution that had convinced the majority.*<sup>1</sup>

In other words, Darwin was able to *describe a very large complex, semi-closed system* (earth) by modelling it with *much smaller, simplified, semi-closed systems* (islands).<sup>2</sup> Island processes are amplified through compression<sup>3</sup> and thus, relative to continents, exhibit explosive rates of evolution.<sup>4</sup> Thus, islands enable us to yield insights which often elude practitioners of the continental approach.

~~Island Bioeconomics~~ *Problem Solving*, our solid *physique générale* foundation for economic analysis, supports a useful field instrument: a tripod made up of (1) Evolutionary Game Theory,<sup>5</sup> (2) a theory of value based upon relative insularity,<sup>6</sup> and (3) Sir Karl Popper's solution to *The Problem of Induction*.

Although time will presently not enable us to scratch the surface of most of the beloved islands noted above, we will cover specific aspects relating to several, and, moreover three fundamental qualities which relate to them all: (1) The inhabitants of these islands have demonstrated exceptional preferences for relative insularity, (2) they have maintained these preferences through fierce independence and relative autonomy, and (3) these islands are thus relatively *valuable*.

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1 Italics mine, Baldacchino 2007, p 202.

2 Compared with continents... [islands] have a restricted area and definite boundaries, and in most cases their biological and geographical boundaries coincide. The number of species and of genera they contain is always much smaller than in the case of continents, and their peculiar species and groups are usually well defined and strictly limited in range... their relations with other lands are often direct and simple and even when they are more complex are far easier to comprehend than those of continents (Wallace 1880, pp 241-242).

3 It appears almost all ecological and evolutionary processes...are amplified on islands; generally speaking, the smaller the island, the more amplified these processes are. Small size and low diversity seem to be the main factors. With populations existing in miniature, they are prone to stochastic, or random, processes.... Such a mosaic of habitats in a tiny area promotes evolutionary radiation. Conversely, the small size of islands means that they are exquisitely vulnerable to biological invasion and disturbance as there are few distance barriers to dispersal, and few areas are immune to disturbance by inaccessibility. On the plus side, 'amplification by compression' makes islands particularly useful...on islands, process that may be subtle on continents tend to be more clearly exposed (Baldacchino 2007b, p 193).

4 Carlquist 1974, p 20.

5 See ABBREVIATIONS & DEFINITIONS: *Evolutionary Game Theory*

6 See ABBREVIATIONS & DEFINITIONS: *Funk-Zweikampf Solution*

As noted in my previous correspondence, the title of my seminar is *On the Problem of Connectivity: Branding Insularity*, and I am especially keen for this discussion for a myriad of reasons, including the fact that two of my four favourite boats happen to represent two strong global brands which have deep cultural, maritime, evolutionary, and, most importantly, *insular* connections to Åland: the Hallberg-Rassy 54<sup>1</sup> and another German Frers design, the Swan Club 42.<sup>2</sup> In fact, briefly considering these brands may help us navigate two challenging, deep-water currents which run the course of this paper.

The Hallberg-Rassy 54 review in the current issue of *Premier Cruising Boats of the World* captures the essence of this brand exquisitely:

Over the last few years something big has started to happen every August on the *remote isle* of Orust off the west coast of Sweden. Cruising sailors and yachtsmen from all over Europe and North America congregate for the weekend in a celebration of fine yachts and raise their glasses to the pleasures of owning and cruising some of the best yachts built anywhere in the world. It is a kind of *old fashioned* happening where you will see *more blue blazers in the crowd than tie-dyed T-shirts* because the sailors who come are there to look at, admire and possibly buy a Hallberg-Rassy. The happening takes place in the Hallberg-Rassy marina and boat building facility in the *small town* of Ellös, which is a good hour's drive north of Gothenburg. It all started years ago as a simple open house at which the boat builder entertained its customers, vendors and friends. But such is the HR *mystique*, and the worldwide attention that soon followed, that the simple open house became a boat show that then grew into the happening it is today.

In a smart, egalitarian gesture, HR invites its competitors to show their boats at the weekend event, making this one of the best boat shows in Scandinavia. Over that weekend in August roughly 24,000 sailors attend the event, which is almost equivalent to the number of people who attend the America's largest sailboat show in Annapolis, Maryland, each October.<sup>3</sup>

Although there are several branding elements at play here, the most significant – *leveraging insularity* – is an element I suppose you all know well, since I came to understand this principle through a lecture given by Bjarne Lindström, and thus began to see how Åland has leveraged insularity, by capitalizing upon your strategic maritime position between Sweden and Finland, two regions with significantly lower levels of relative insularity, yet more insulated from one another than to Åland.

Before moving on to the beautiful Swan, however, we should take a few moments to consider *cultural*

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1 See: [www.hallberg-rassy.com](http://www.hallberg-rassy.com)

2 See: [www.nautorgroup.com](http://www.nautorgroup.com)

3 All italics mine, 2008, pp 14-15.

*evolution*, as this problem is central the entire discourse. The second paper in this three-part series explores the benefit of an *evolutionary world view*, which, to some, may seem rather unnecessary, nearly 150 years after Darwin's *Origin*. Unfortunately, however, the emphasis seems necessary. In 2004, sixty percent<sup>1</sup> of Americans *still* did not believe in evolution, but the worst part of it is, that I suspect the *majority* of the forty percent of people who *do* believe in evolution may still be unable to adopt an evolutionary world,<sup>2</sup> as the strangle-hold religion and culture continues to impose upon *social norms* seems nearly inescapable. And of course many have a firm grasp on evolution when it comes to many of the species inhabiting the Earth, the great majority seem to be unable to recognize these mechanisms when it comes to humans. Indeed, the general failure to grasp the relevance of evolution, especially *cultural evolution* is a key concept in our discourse, and the Dragonfly offers a portal to this problem. Although Quorning's Dragonfly 35 isn't manufactured by a well-recognized, global brand, this award-winning, Danish, island made, Skíðblaðnir<sup>3</sup> shares the same Nordic pedigree as the Hallberg-Rassy and the Swan.

For comparison's sake, let's go back and take a look at what I suspect you may agree is a handsome<sup>4</sup> HR 54:

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- 1 Americans are certainly capable of belief, and with rocklike conviction if it originates in religious dogma. In evidence is the 60 percent that accept the prophecies of the *Book of Revelation* as truth, and yet in more evidence is the weight that faith-based positions hold in political life. Most of the religious Right opposed the teaching of evolution in public school, either by an outright ban on the subject or, at the least, by insisting that it be treated as 'only a theory' rather than a "fact" (Wilson 2006, pp 1479-1480).
  - 2 Many who accept the fact of evolution cannot, however, on religious grounds, accept the operation of blind chance and the absence of divine purpose implicit in natural selection (Wilson 2006, p 1480).
  - 3 In Norse mythology, the god Frey counted among his greatest treasures a magic ship called Skíðblaðnir which had been built by those consummate craftsmen of legend, the dwarves; according to Snorri Sturluson it always had a following wind, and it was so ingeniously constructed that it was large enough to carry the entire pantheon of the gods..., yet could be folded up and tucked into a pouch when not in use (Magnússon 1980, p 21).
  - 4 The new Frers-designed Hallberg-Rassy 54 is 54 feet, 11 inches LOA, so we could call it a 55-footer.... This design looks very much like the rest of the Frers-designed HR series, i.e. *conservative in proportions and relatively free of contour-driven styling tricks. In short, this design is free of eye candy and relies upon overall carefully controlled proportions* for its good looks. I would not call it a sexy looking boat but it is *handsome* [All italics mine, Perry 2007, p1].



Quorning's dashing Dragonfly 35, however, shares relatively few design traits with this boat, namely because the Dragonfly is not a keel-boat, it is a *trimaran*, and, I submit that the principles of cultural evolution dictate that, *by design*, it may prove extraordinarily difficult - *if not impossible* - to elevate Quorning (a manufacturer of strictly trimaran designs) to the enviable pantheon enjoyed by the Swan and Hallberg-Rassy brands for at least the *next several decades, if not several hundred years*. Why so long? Because evolution works *very* slowly. In short, the trimaran design is far from proving itself (as in hundreds of years) as an evolutionary stable strategy (hereafter ESS).<sup>1</sup> For those unfamiliar with trimarans, let's take a look. Although you may find many pictures of the lightning-quick Dragonfly on Quorning's website,<sup>2</sup> I'll offer a photograph of an even faster trimaran in hopes that it might entice you to turn the pages of my OPEN LETTER TO PARTHA DASGUPTA, which includes the story of a self-sufficient, fiercely independent sailor who helps us frame *The Problem of Sustainable Economic Development*.

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1 See ABBREVIATIONS & DEFINITIONS: *Evolutionary Stable Strategy*

2 See: [www.dragonfly.dk](http://www.dragonfly.dk)

Although three of my four favourite boats have evolved through the strong Norse boat-building tradition, I must confess my very favourite boat on Earth happens to be French: Francis Joyon's Nigel Irens & Bernard Caberet designed *Idec II*:



If trimarans represent two of my four favourite boats, one of which happens to be my very favourite boat on Earth, you may, once again, wonder why I suggest it might take as long as a *century* to build a strong brand around trimaran designs?

In 1908 "French philosopher Alain (E' mile -Auguste Chartier) proposed that boat design would be subject to natural selection,"<sup>1</sup> and although it turns out his logic and intuition was right on the mark, for the past 100 years' the validity of his theory has been consistently rejected. This past December, however, two great explorers in the biology department at Stanford confirmed Alain's theory in a PNAS publication<sup>2</sup> (an outstanding research source, I might add) by demonstrating that functional boat designs evolve much more slowly than decorative ones:

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1 Rogers and Paul R. Ehrlich 2007, p 3417.

2 Proceedings of the National Academy of Sciences of the United States of America [PNAS] is one of the world's most-cited multidisciplinary scientific serials. Since its establishment in 1914, it continues to publish cutting-edge research reports, commentaries, reviews, perspectives, colloquium papers, and actions of the Academy. Coverage in PNAS spans the biological, physical, and social sciences. PNAS is published weekly in print, and daily online in PNAS Early Edition. The PNAS impact factor is 9.64 for 2006 (PNAS 2008).



It has been claimed that a meaningful theory of cultural evolution is not possible because human beliefs and behaviors do not follow predictable patterns. However, theoretical models of cultural transmission and observations of the development of societies suggest that patterns in cultural evolution do occur. Here, we analyze whether two sets of related cultural traits, one tested against the environment and the other not, evolve at different rates in the same populations. Using functional and symbolic design features for Polynesian canoes, we show that natural selection apparently slows the evolution of functional structures, whereas symbolic designs differentiate more rapidly. This finding indicates that cultural change, like genetic evolution, can follow theoretically derived patterns.<sup>1</sup>

Although we will not presently head further off-shore, into the deep blue waters of cultural evolution, I might merely note a bit of irony: the trimaran design history – a genetic descendant of the ancient Polynesian outrigger design, is actually much *older* than keelboat history – but this historical curiosity is largely irrelevant, since, over the past five centuries, global keel-boat production has dominated, and thus - statistically speaking - almost all research & development (hereafter R&D) has refined this design far more than the older outrigger designs (including modern-day catamarans as well, for example). Thus *evolution* has put keel-boats to a far greater test than it has to trimarans. And this may be more important than one may suspect when weighing the importance of ESS. One of the most critical points in an excellent evolutionary game theory overview out of the Stockholm School of Economics, Jörgen W. Weibull's WHAT HAVE WE LEARNED FROM EVOLUTIONARY GAME THEORY SO FAR?<sup>2</sup> A sub-chapter entitled “*Why imitate,*” may represent of the most important tools evolutionary game theory may have to offer:

Schlag (1998) analyses the question what imitation rules an individual should choose, when she now and then has the opportunity to imitate another individual in the same player position but is otherwise constrained by severe restrictions on information and memory. He finds that if the individual wants a learning rule that leads to non decreasing expected payoffs over time in all stationary environments, then the individual should (a) *always imitate* (not experiment) when changing strategy, (b) never imitate an individual whose payoff realization was worse than her own, and (c) imitate individuals whose payoff realizations are better than her own with a probability that is proportional to this payoff difference.<sup>3</sup>

With Schlag's insight in mind, I'll attempt to synthesize the relevance of cultural evolution by framing this strategic evolutionary approach to boats, blue blazers, glass bottles, Coca-Cola, and Tupperware.

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1 Ibid, p 3418.

2 2002.

3 2002, p 9.

Recall that Perry's review of the Hallberg-Rassy 54 noted she was *conservative in proportions and relatively free of contour-driven styling* tricks, which meant, essentially, that the boat was very, very similar to every other Hallberg-Rassy design throughout their *long history* (Indeed, the most consistent criticism in Hallberg-Rassy reviews is that they look *old fashion*, which, in terms of ESS, we may discover, represents a compliment rather than criticism). Why might a brand which deployed this ultra-conservative product development path appeal to *blue-blazored, old-fashioned sailors*? Why might *blue-blazored, old-fashioned* sailors make more money than *tye-dyed* sailors? Why might this approach lead to the *natural* development of *dominant* brands?

Consider the following Coca-Cola case study in light of evolutionary game theory: The original 1886 recipe remained unchanged until the infamous corporate debacle of the 1985, the disastrous introduction of New Coke, a beverage nobody wanted to buy. The Coca-Cola Co. quickly reverted to *imitation*, putting their original recipe back on the market, and watched their sales numbers rebound.

Is it possible that the Coca-Cola case and the evolution of Hallberg-Rassy naval architecture represent the ESS Weibull brought to our attention? As far as the Hallberg-Rassy brand is concerned, hundreds of these *safe, stable*, blue-water cruisers have made thousands of successful trans-Atlantic voyages without *one* sending its Captain and crew to Davey Jone's locker. *Most of the time*, trimarans offer *safe, stable* trans-Atlantic passage as well, but *sometimes*, when pushed too hard, they bury their omas in waves, pitch-polling end-over-end, dismasting, and scattering her crew in the chill waters of the Atlantic.

In my seminar I will suggest that the lone path to branding success is total policy alignment, be that within a corporation or a relatively insular state.

Although I will dedicate some of my seminar to this topic, here's one small way in which policy disharmony is slowly but surely contributing to the bankruptcy of a fairly strong brand. On 3 May 1984, the Prince Edward Island (hereafter PEI) provincial government outlawed canned beverages, stating that re-fillible glass bottles were more environmentally friendly (which, of course, they are), and this indeed helped build PEI's "Green Island" brand.

Tourist loved it. On the sunny second day of September, 2007, your author sat outside on the deck of the Stanhope Golf Clubhouse, overlooking Covehead Bay, visiting with his father and his wife, drinking Coca-Cola's from glass bottles as we watched my brother Luke and sister Katya hit golfballs on the range. At one point my father smiled and said, "I love drinking a Coke from a bottle."

Why do you think he likes drinking Coke from a bottle? Merely for nostalgia's sake? A trip down memory lane to Midwestern America in the 1950's?

On the psychological surface, perhaps, but may I suggest there were genetic mechanisms at work beneath the psychological frosting. I believe my father's comment – a comment once often uttered by PEI tourists – offers a brief glimpse of evolution at work. Drinking from glass bottles is an ESS with a relatively long track record, and that makes it a powerful branding tool for both Coca-Cola and PEI. Please imagine, if you will, a sweet grandmother, well into her eighties, putting left-overs away after a big family meal. She spoons mashed potatoes into a heavy glass bowl, covers it with aluminum foil, then struggles to lift it from the counter. Her daughter rushes to assist with the heavy bowl, exclaiming, "God, Mom, I wish you'd let me buy you some Tupperware!"

But Grandma doesn't want Tupperware, never has wanted Tupperware, and never will. She, like so many other grandmothers, *likes things just the way they are, just the way they always have been*. They like to do things in the same way, *because the same way has always worked in the past*. Grandma's strategically sound ESS has helped her survive for more than eighty years. And, perhaps some day when her daughter discovers that the plastics in Tupperware and the linings in cans (including cans of Coca-Cola) are known carcinogenics, perhaps she'll know why her mother was always right. And the greatest part of it is this: Grandma didn't even need to know or have reason to believe that Tupperware could cause cancer. Again, intuitively – through the gift of evolution – *she subconsciously held a three-stage learning rule that lead to non-decreasing expected payoffs over time in all stationary environments*:

- (a) *always imitate* (not experiment) when changing strategy, (b) never imitate an individual whose payoff realization was worse than her own, and (c) imitate individuals whose payoff realizations are better than her

own with a probability that is proportional to this payoff difference.<sup>1</sup>

The reason the stereo-type of *old fashioned* elders is so strong is largely due to survival bias: More *old fashioned* people survive to grow old!

But the problem with PEI's can-ban was that it was *not* aligned with policy and it was not enacted with environmental health and branding consideration, for it was in fact a lie. A local businessman by the name of Seaman had a bottling plant and a beverage brand, since he seems somewhat aware that he was a member of species believed to be extinct for many years: a dodo,<sup>2</sup> a living, breathing dodo produced in a dodo factory; although dodos were not previously believed to have developed the capacity of self-awareness, this one knew that he would not survive once the billion dollar bridge was built (of which, more to follow), and more fit competitors (Coca-Cola, Pepsi, Walmart, etc.), which have been far more rigorously tested and adapted to merciless global markets, are able to drive their transport trucks ashore. So Seaman asked for a hand-out. And since "always cooperate" is a game theoretical strategy employed by dependent people, the PEI legislature concocted a passable lie, and enacted the can ban.

And it all worked out just fine for Seaman and fine for PEI until Pepsi bought out Seaman ( and Seaman escaped the constitutionally constructed evolutionary filter, sailing to Nova Scotia with a chest full of dodo dollars). But since dodos do not possess evolutionary worldviews, and are unable to derive dominant ESS, they couldn't see the evolutionary stable value of the can-ban. So, last month, *after 34 years*, they simply lifted the ban!

*Environment Minister* George Webster has said there are environmental advantages to cans over bottles. In 2007, he told CBC News that while glass bottles require cleaning and refilling, cans can be crushed, hauled to a recycler, melted down and recycled into another product.

*But most environmental groups say the suggestion that recycling cans takes less energy than refilling bottles is wrong. The provincial government itself has for more than 20 years argued the environmental advantages of the bottle.*

Later Saturday, Charlottetown police will escort a Pepsi truck to the street party, where Webster - who some have dubbed the "minister of pop" - will officially open the first can of soda sold legally on P.E.I. in a generation.

*"That the minister of environment is opening the can of pop, I think he should be ashamed of himself," Labchuk said.<sup>3</sup>*

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1 2002, p 9.

2 Refer to the tale of the Great Auk in footnote 2 on the Cover page (of which, more to follow).

3 CBC 2007.

One other policy/branding misfit I might mention is that PEI Environment Minister George Webster also happens to be large *potato farmer*. But since we're not finished with boats, I'll save this curious anecdote for later.

In the meantime, for more on imitation as an ESS, see Schlag's *Why imitate, and if so, how? A bounded rational approach to multi-armed bandits*.<sup>1</sup>

Now let's move on to a snapshot of the Swan brand:

The story of Nautor's Swan has its roots 300 years ago in a landscape where temperatures can fall to  $-30^{\circ}\text{C}$  in the depth of winter and the sea may be frozen five months of the year.

*The unforgiving landscape around the small town of Jakobstad in Finland is an unusual birthplace for a company whose products have come to embody luxury and quality in the sailing world...*

In 1966 this unique environment inspired Nautor's Swan's founder, Pekka Koskenkylä, to initiate serial production of fibreglass yachts, taking advantage of Jakobstad's long history of boat and ship building that started in the 17th century.<sup>2</sup>

Now this is where things may start to get a bit tricky, because I submit that *unforgiving* landscapes are *not* unusual *birthplaces* for *valuable* Swans and *valuable* brands; in fact, I submit this is the *only* way to create value, that value is in fact a *derivative function of relative insularity*. And the reason this is tricky is due to the fact that this analysis is based upon our hereto *unpublished* theory of value based upon relative insularity. Thus you may begin to understand that the length of this letter is merely a matter of form following function. Although my twenty-minute seminar will merely cover a very small fraction of the material presented herewith, I believe presenting branding strategies without the underlying theory would not offer much utility.

Thereby this paper offers a *relatively* brief description of a simple solution to a very complex problem. As Robert Aumann noted, "economics teaches us that things are not always as they appear,"<sup>3</sup> and although I will naturally leave it up to you to decide if this is the case with *The Problem of Sustainable Economic Development*, it is certainly the lesson that I have learned. When I completed this discourse in May it was over 400 over pages, and, alas, this full-length manuscript represents the best description for our simple solution to this very complex problem. Naturally,

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1 *Journal of Economic Theory* 78, 1998, 130-156.

2 Nautor 2008, p 1.

3 *Ibid*, p 351.

however, I realized this manuscript was too panoptical and consilient for this forum, and thus divided the discourse into three parts; this paper represents the first instalment of a trilogy, and I will be happy to provide the second and third papers upon request. Furthermore, acknowledging individual preferences and time constraints, I have placed as much of this discourse as possible into optional appendices and detailed footnotes; I have also orchestrated two additional, abridged reading strategies for those interested in grasping the essence of this first discourse in as few pages as possible. The good news for these readers is that this abridgement is nearly complete! If you're able and inclined to invest five more minutes, head directly to our theory of value and axiomatic<sup>1</sup> solution to *The Problem of Sustainable Economic Development*. This theory, I submit, not only offers a unique solution, but also maps the *range* of scientific knowledge relating to our problem, namely (1) the lower limit of what *must* be known, and (2) the upper limit of what *may* be known. This axiomatic treatment enables us to arrive at our solution by filtering out the wrong solutions. As Feynman stated in one of his famous lectures, “the laws of nature are approximate: . . . we first find the 'wrong' ones, and then we find the 'right' ones,”<sup>2</sup> and I propose our axioms guide us through this very process. Though these axioms are detailed in the second paper, the five-page abridgement of our solution is found in APPENDIX I: A UNIFIED THEORY OF VALUE FOR THE BIOLOGICAL AND SOCIAL SCIENCES.

Those with more time to read, however, may benefit from a more gradual introduction to this discourse.

As an institute dedicated to comparative island studies, I suspect many may value the remainder of this letter the most, since it retraces our methodological steps which lead to the development of our theory, and furthermore embodies its essence; I might only humbly suggest spending a moment re-considering the TOUCHSTONE, the critical inter-relationship between Darwin's *Struggle for Life* and Clauswitz's *Zweikampf*, as

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<sup>1</sup> *One states as axioms several properties that it would seem natural for the solution to have and then one discovers that the axioms actually determine the solution uniquely* (Italics mine, Nash 1953, p 129.

<sup>2</sup> 1963, p 2.

this relationship illuminates the philosophical foundation<sup>1</sup> of our unified theory. As Darwin emphasized, “When we reflect on this struggle, we may console ourselves with the full belief, that the war of nature is not incessant, that no fear is felt, that death is generally prompt, and that the vigorous, the healthy, and the happy survive and multiply.”<sup>2</sup> Anecdotal evidence seems to suggest that meditation upon this fundamental truth is this critical to understanding Clausewitz's analogue description of human behaviour. Indeed, Aumann grasped this truth completely and expressed it eloquently in his 2005 *Sveriges Riksbank Prize* in memory of Alfred Nobel:

Can war be rational?... The answer is yes, it can be. In one of the greatest speeches of all time – his second inaugural – Abraham Lincoln said: “Both parties deprecated war; but one would make war rather than let the nation survive; and the other would accept war rather than let it perish. And the war came.” It is a big mistake to say that war is irrational. We take all the ills of the world – wars, strikes, racial discrimination – and dismiss them by calling them irrational. They are not necessarily irrational. Though it hurts, they may be rational. *If war is rational, once we understand that it is, we can at least somehow address the problem. If we simply dismiss it as irrational, we can't address the problem.*<sup>3</sup>

Or, as he stated more directly: “Pray for the welfare of the government, for without its authority, man would swallow man alive.”<sup>4</sup> I submit our theory of value will elude comprehension without this fundamental understanding, and with the exceptions of my colleague, Jordan Walker, Dr Barry Bartmann, and perhaps Godfrey Baldacchino (I'm not certain on Godfrey's position on this point, I'd advise the curious to take up this point with the man himself), I have found this concept especially difficult for many (if not most) inhabitants of PEI to grasp (of which, more to follow). However, since war is no stranger to the Norse, I suspect this is a truth you may be willing to accept, but I'll not assume so much; although I'm not a gambling man, I'd wager a Spanish doubloon that any doubter willing to set sail from Cape Town (for the sake of our example, in that handsome HR 54), and cruise north along Africa's coastal waters toward the Arabian

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1 The logical structure of the Darwinian foundation remains remarkably intact—a fascinating historical observation in itself, and a stunning tribute to the intellectual power of our profession's founder. Thus... I believe that the best way to exemplify our modern understanding lies in an extensive analysis of Darwin's basic logical commitments, the reasons for his choices, and the subsequent manner in which these aspects of “the structure of evolutionary theory” have established and motivated all our major debates and substantial changes since Darwin's original publication in 1859. I regard such analysis not as an antiquarian indulgence, but as an optimal path to proper understanding of our current commitments, and the underlying reasons for our decisions about them (Wilson 2006, p 1433).

2 Darwin 1859 as cited in Gould 2002, p 137.

3 Italics mine, p 351.

4 Ibid, p 254.

peninsula, would be willing to accept Aumann's conjecture long before reaching Saudi Arabia. In fact, I might even be willing to wager that they would not make it to Saudi Arabia at all.

Those readers with more time and deeper interests, especially those familiar with game theory and problems associated with *The Problem of Induction* may reap much of the philosophical fruit this discourse has to offer with a preview of the road ahead, the introduction to the second instalment of this trilogy, which you will find in APPENDIX II: AN OPEN LETTER TO PARTHA DASGUPTA. This introduction, in conjunction with the axioms previously mentioned in APPENDIX I, provide a condensed description of our philosophical, game theoretical foundation.

Those less familiar with these arenas, however, may benefit from the entire discourse, which I might add is not nearly as long as it may appear, as the copious, nutritious, content-rich footnotes and appendices represent quite optional supplements. I should also offer a special note to those readers unfamiliar with game theory (see APPENDIX III: THE PRISONER'S DILEMMA for an excellent 2-page introduction to this conceptual tool), and those whom may doubt its usefulness: You may all be pleased to know I share your scepticism (and address it in detail in the final segment of this discourse),<sup>1</sup> and, despite the necessarily condensed and thus perhaps esoteric *abstract* which preceded this introduction, I have endeavoured to maintain a straightforward course.<sup>2</sup>

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1 This paper reviews the introduction to our solution for *The Problem of Sustainable Economic Development*, and discusses the origins and justifications of its game theoretical basis. We review the axioms and *Theory of Value* from Part I, then move on to our demonstrative falsification of the central thesis of "Ecological Economics." Rubenstein shares our suspicion of applied mathematics, and our scepticism regarding game theory; thus, we test: *Can game theory to improve real-life strategic interactions? To do so, we play 2-person, non-cooperative games which tests a widely held, influential theory: "Driving small, fuel-efficient cars is good for the environment (and thus good for you)." We refute this theory and conclude that driving small, efficient cars is neither good for you nor, in the long run, good for the environment, and thus we refute Rubenstein's conjecture, accepting tentatively, that game theory may, afterall, improve the world* (Funk, forthcoming, abstract).

2 (a) Knowledge is guesswork disciplined by rational criticism.

This turns the struggle against dogmatic thinking into a duty. It also makes the utmost intellectual modesty a duty. And above all, it makes a duty of the cultivation of a simple and unpretentious language: the duty of every intellectual (Popper 1992, p 40).

(b) The ordinary citizen is struck dumb with awe when he is told about gold reserves, note issues, inflation, deflation, reflation, and all the rest of the jargon. He feels that anyone who can converse glibly about such matters must be very wise, and he does not dare to question what he is told....It will be necessary, if this state of affairs is to be remedied, to...find ways of simplifying the principles...so that they can be widely understood (Russell 1935 pp 61-62)



I will also note that this relatively exhaustive discourse may strike some readers as explicitly personal and highly opinionated. I suggest that there is a *method to the madness*: As Godfrey Baldacchino observed after generously critiquing the first draft of this discourse:

Yes, there is clearly a method to the madness. It will be exasperating to most readers, because you really walk the talk when it comes to *dismantling disciplinary boundaries*. Your treatise does range from 'astronomy' to 'zoology'.<sup>1</sup>

Though I will address the seemingly “exasperating” nature of the *data cascade* this discourse unleashes, it would be disingenuous to offer an apology, since *every* truthful treatise *must* range from astronomy to zoology. The only true way to completely embrace *the unity of nature*,<sup>2</sup> the truly inter-disciplinary nature of economics, political science, psychology, evolutionary biology, physics, philosophy, nissology, and every other so-called “subject matter,” is to recognized that subject matters do not in fact exist, and it is our hope that this discourse demonstrates this reality. And this recognition comes with considerable responsibility, for once the blinders of subjects are removed, the great mass of widely-accepted assumptions dogmatism once had to offer, evaporate like powdered sugar in the sea. Suddenly, we are unable to utilize jargon and short-hand to take the same short-cuts which have consistently lead us down dead-end paths. We are no longer able to communicate to an audience of “experts” since there are in fact *no* experts of *anything*,<sup>3</sup> much less *any* experts of *everything*. All assumptions must be carefully defined, and all positions must be meticulously developed.

I also submit that this somewhat maddening data cascade has been effectively utilized in the past:

[Darwin] granted even more importance to his relentless presentation of dense documentation for the factuality of change - for only such a *cascade of data* would force the scientific world to take evolution seriously.... Facts literally pour from almost every page of the *Origin*....In some parts, the *Origin* reaches

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1 Personal Correspondence 2008.

2 For Humboldt, “the unity of nature” meant the interrelation of all... sciences... which the scientist unraveled by discovering patterns in myriad, painstakingly collected data. This ambition to view nature as a whole wasn't unique to Humboldt, though. It was a quest that historians believe had begun with the ancient Greek philosopher Thales of Miletus, in the sixth century B.C. Recognized as the founder of Greek geometry, Thales also taught that all matter is ultimately composed of water. Though dead wrong, the theory was still an intellectual turning point, since it marked the first time anyone had tried to explain natural phenomena without appeal to religious dogma. It was also the first time that anyone had tried to explain the whole, divergent physical world in one grand unifying principle (Helferich 2004, pp 23-24).

3 Popper 1959.

an almost frenetic pace in its cascading of facts, one upon the other...

Whenever he introduces a major subject, *Darwin fires a volley of disparate facts, all related to the argument at hand...* This style of organization virtually guarantees that Whewell's "consilience..." must become the standard method of the *Origin*. Darwin's greatest intellectual strength lay in his ability *to forge connections and perceive webs of implication* (that more conventional thinking in linear order might miss). When Darwin could not cite direct evidence for actual stages in an evolutionary sequence, he relied upon consilience - and sunk enough roots in enough directions to provide adequate support for a single sturdy trunk of explanation.<sup>1</sup>

In other words,

like Humboldt, Darwin was a synthesizer, one of those... who propel science forward through their compulsion to create order (cosmos) out of the apparent disarray (chaos) of natural phenomena. The result in Darwin's case..., single-handedly propelled the science of biology from a collection of disparate facts into a "system of knowledge."<sup>2</sup>

I will have a bit more to say about the methods of Charles Darwin as they map priceless methods for comparative island analysis. I will also suggest that our seemingly unusual style is perhaps not so unusual and, moreover, fitting, as this essay falls into a well

recognized category of essays, a literary genre defined, ever since Montaigne's initiating 16<sup>th</sup> century efforts, as the presentation of general material from an explicitly personal and opinionated point of view - although the best essays (literally meaning "attempts," after all) tend to be forthright in their expression of opinions, the basis of authorial preferences. On the other hand, technical treatises in science do not generally receive such a license for explicitly personal expression. I believe that this convention in technical writing has been both harmful and more than a bit deceptive. Science, done perforce by ordinary human beings, expressing ordinary motives and foibles of the species, cannot be grasped as an enterprise without some acknowledgement of personal dimensions in preferences and decisions - for, although a final product may display logical coherence, other decisions, leading to other formulations of equally tight structure, could have been followed, and we do need to know why an author proceeded as he did if we wish to achieve our best understanding of his accomplishments, including the general worth of his conclusions.

Logical coherence may remain formally separate from ontogenetic construction, or psychological origin, but a full understanding of form does require some insight into intention and working procedure. Perhaps some presentations of broad theories in the history of science - Newton's *Principia* comes immediately to mind - remain virtually free of personal statement (sometimes making them, as in this case, virtually unreadable thereby). But most comprehensive works, in all fields of science, from Galileo's *Dialogo* to Darwin's *Origin*, gain stylistic strength and logical power by their suffusion with honorable statements about authorial intents, purposes, prejudices.<sup>3</sup>

And finally, I will add that if it were possible to condense this communiqué to twenty or thirty pages, or if

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1 Gould 2002, p 109.

2 Helferich 2004, p xxi.

3 Ibid, p 34.

it were possible to accurately and effectively communicate a tenable solution to *The Problem of Sustainable Economic Development* in the type of academic paper or journal you may be accustomed to reading, then it seems likely that a tenable solution would have been tabled long before this letter.<sup>1</sup>

Thus, in short, this letter was written in the best and only way which it could be honestly written. I will also note that I fully embrace the charge that “our aim as scientists is objective truth; more truth, more interesting truth, more intelligible truth.”<sup>2</sup> However, conjectures and refutations herewith may be ridden with error,<sup>3</sup> they are open to criticism, and my aim is not to convince or even to sway.<sup>4</sup> This final point seems rather critical in light of the contemporary prevalence and popularity of normative<sup>5</sup> practices.

My present design... is not to teach the method which each ought to follow for the right conduct of his reason, but solely to describe the way in which I have endeavoured to conduct my own.... This tract is put forth merely as a history, or, if you will, as a tale, in which, amid some examples worthy of imitation, there will be found, perhaps, as many more which it were advisable not to follow, I hope it will prove useful to some without being hurtful to any, and that my openness will find some favour with all. It is possible I may be mistaken; and it is but a little copper and glass, perhaps, that I take for gold and diamonds. I know how very liable we are to delusion in what relates to ourselves, and also how much the judgements of our friends are to be suspected when given in our favour.<sup>6</sup>

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- 1 If the problems of land degradation could have been solved by research and reports alone, they would have disappeared long ago. It has been [sixty] years since some of the first seminal works on environmental degradation were written (for example, Jacks and Whyte 1939; Osborn 1948; Carson 1962; Commoner 1972), and perhaps [twenty] to [twenty-five] since the high-water mark of environmental movements in the United States and Europe was reached (Blaikie & Brookfield 1987, p xxvii).
  - 2 Popper 1992 p 4.
  - 3 Our knowledge, as well as our ignorance, at any time and on every issue, tends to be opportunistically conditioned, and thus brought to deviate from full truth (Myrdal 1975, p1).
  - 4 The genuine discipline of the Enlightenment, the true rationalist, does not even want to persuade, nor even to convince. He remains always aware that he may err. Thus he esteems too highly the independence of the other person to try to sway him in important matters; rather he wants objections and criticisms. He wants to arouse and stimulate the cut and thrust of argument. This is what is valuable to him. Not only because we may approach truth better with the free exchange of opinion, but also because he values this process as such (Popper 1999, pp 206-207).
  - 5 These days, one commonly asserted imperfection in the science-policy interface is that some so-called “science” is imbued with policy preferences. Such science may be labelled as normative and it is potentially an insidious kind of scientific corruption. By normative science, I mean “information that is developed, presented, or interpreted based on an assumed, usually unstated, preference for a particular policy or class of policy choices.” In some forms, normative science is not obviously normative to policy makers or even to many scientists. Such “science” has become a serious problem. I believe that use of normative science is stealth policy advocacy. Science, of course, is not value free because it is a human enterprise, but this fact does not make all science normative. Policy-neutral science is a way of learning about the world and it is characterized by transparency, reproducibility, and independence. Consider the simple but fundamental difference between scientific “is” and the policy “ought.” Science deals with the “is” world (and the “was” and “will be” states of the world) as does the policy world, but the policy world also deals with the “oughts” and “shoulds.” Science is, or should be, bounded in the “is” world (Lackey 2004, p 2).
  - 6 Descartes 1637, pp 1-2.

With these objectives and disclaimers in mind, consider the following account of my exploration of three islands with the purpose of discovering a solution to *The Problem of Sustainable Economic Development*.

I travelled to Iceland<sup>1</sup> twice last summer, in search of the indefatigable and unconquerable spirit Halldór Laxness captured in *Independent People*:<sup>2</sup> I wanted to come to understand people who were willing to fight to protect their natural resources (I was thinking primarily of the cod-wars), as I was beginning to suspect the lesson of Icelandic independence and, more broadly speaking, the Nordic *Struggle for Life* may offer solutions to problems I was observing on PEI and, more generally, across Atlantic Canada (including Newfoundland).<sup>3</sup> Several notable writers echo this conjecture,<sup>4</sup> and, as Francios Doumenge<sup>5</sup> noted while reflecting upon the 1992 North Atlantic island conference on PEI which “sought to understand the critical problems currently facing small islands”<sup>6</sup>:

Looking back at all the different island problems, my understanding is that most of these could be best solved

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1 (a) Iceland is an island of some 103 100 km<sup>2</sup> located in the North Atlantic just south of the Arctic Circle. Iceland's central point is approximately 65 North and 19 West. The country's exclusive economic zone (EEZ) is 758 000 km<sup>2</sup> or more than seven times the surface area of the mainland. Shortest distances to neighbouring countries are: to Greenland 290 km, to the Faroe Islands 435 km, to Scotland 812 km and to Norway 970 km (Arnason 1995, p 5).

(b) Settled by Norwegian and Celtic (Scottish and Irish) immigrants during the late 9th and 10th centuries A.D., Iceland boasts the world's oldest functioning legislative assembly, the Althing, established in 930. Independent for over 300 years, Iceland was subsequently ruled by Norway and Denmark. Fallout from the Askja volcano of 1875 devastated the Icelandic economy and caused widespread famine. Over the next quarter century, 20% of the island's population emigrated, mostly to Canada and the US. Limited home rule from Denmark was granted in 1874 and complete independence attained in 1944. *Literacy, longevity, income, and social cohesion are first-rate by world standards* [italics mine, *CIA World Factbook*, updated 1 November 2007].

2 Laxness 1946.

3 The fishery in Newfoundland, and in other parts of Atlantic Canada is part industry, part social-welfare program, in contrast to Iceland where the fishery is organized almost exclusively as an industry....Iceland lands slightly more fish than all of Atlantic Canada with one-tenth the number of people fishing. It uses about 60 per cent fewer people to process the fish (Simpson 1995).

4 The relative success of the Icelandic fisheries suggests that other fishing nations may have something to learn from the Icelandic experience (Arnason 1995, p x).

5 I worked in the fisheries and aquaculture in Micronesia, Polynesia, and melanesia for fourteen years (1960-1973), the last two years as Project Manager for the South Pacific Islands Fisheries Development Agency (FAO/UNDP). During this period my investigations also concerned coral reef conservation for the French National Research Council and small islands socio-economic development for the South Pacific Commission. Next, I was for three years (1976-1979) head of the educational system for the three American overseas French departments (Martinique, Guadeloupe, and French Guiana) as Rector of the University of Antilles-Guyane. Lastly, I served from 1987 to 1988 as President of the University of Antilles-Guyane. Lastly, I served from 1987 to 1988 as President of the Council of Administration of the French Overseas Scientific and Technical Research Institute for Cooperation and Development (ORSTOM).

Along the way, I have compiled extensive reports and written books on these experiences..., plus the report commissioned by UNCTAD on the “Viability of small island states”... for the Belgrade conference.

More than thirty years of familiarity with the Mediterranean and tropical islands world, where I visited and surveyed more than a hundred entities related to eleven independent states and twenty dependent or associated territories with Australia, France, New Zealand, Portugal, Spain, the United Kingdom, and the USA..., have enabled me to develop personal views integrating ecology, natural resources, and ethno-history..., as well as politics and socio-economy (Doumenge 1998, pp 227-339).

6 Doumenge 1998, p 337.

if the island community develops and sustains a sense of unity, which may manifest itself in civic mobilization. Iceland won the cod war because all the Icelanders were prepared to fight against the British fishing fleet and thus conserve their basic resource. Had there been any disagreement on this within the Icelandic population, they would never have won, and they would never have reached their present envious economic situation.<sup>1</sup>

This consensus also reverberates throughout *The North Atlantic Fisheries: Success, Failures & Challenges*:

While Iceland is probably better poised to respond to the future, it has the distinction of being the only fully sovereign state amongst those societies discussed in this volume. Could this be mere circumstance? If not, what are the connections between full political independence and successful fisheries development?

We think there is a link, for two reasons. The first relates to the concrete advantages nation states have over societies politically subordinate to larger nation states in pursuing economic development....

There is no doubt that full control over the relevant levers of national policy can be an enormous advantage to a small, geographically isolated society. One obvious advantage is that priorities that directly address concerns at the local level need not compete with other concerns and priorities from regions more populous and politically dominant in the larger society. In the case of both Newfoundland and PEI, fisheries concerns typically receive little attention on the national Canadian scene.<sup>2</sup>

And thus I also submit that

it is possible that political *independence engenders a certain resolve to make the most of available resources and opportunities*. Such resolve might manifest itself in concrete ways such as programs and policies, and in less obvious forms such as its effect upon collective attitudes. There is some suggestion that Iceland was able to pursue a *highly rationalized strategy of fisheries modernization, at least in part because of the collective realization that the society's future well-being was linked to a prosperous, efficient fisheries*. *The collective sentiment that there was no larger political unit to fall back on might very well have been instrumental in the pursuit of such a strategy*.<sup>3</sup>

Perhaps you're wondering why I wanted to come to understand people who were willing to fight to protect their natural resources? The answer is, as I have previously hinted, is that I was searching for a solution to problem: In January of 2006 the Fraser Institute ranked PEI the worse Province in Canada for business investment. Though I heartily agree with this assessment (in fact I have recently completed research which suggests the economic prospects on PEI have fallen precipitously since), this is by far the least of PEI's problems: PEI has rapidly emerged as the worse place in Canada—perhaps all of North America—for human life. In fact, by European and North American

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1 Ibid p 342.

2 Arnason and Felt 1995, p 300.

3 Italics mine: Arnason & Felt 1995, p 301.

standards, the island is essentially uninhabitable.<sup>1</sup>

In short, I had an island which modelled *The Problem of Sustainable Economic Development* exceedingly well, and I was looking for an island which could model a the solution.

After returning to PEI, I distilled what I had discovered in a working paper entitled: *On the Problem of Dependent People: Natural Resource Valuation Errors in Atlantic Canadian Island Jurisdictions*,<sup>2</sup> and the abstract sums up my general conclusions at this juncture:

This paper focuses upon deficient constitutional constructs and natural resource valuation methods, especially as they generate *The Problem of Dependent People*. Solutions are presented by contrasting the failure of fishery management methodology and practice amongst dependent Canadian islanders, and the relative success of fishery management amongst independent Icelandic islanders. The possibilities that independent people enjoy higher levels of rationality, efficiency, happiness,<sup>3</sup> economic sustainability, general well-being, and are thus, ceteris paribus, less likely to commit errors associated with *The Problem of Induction* are taken into consideration. Likewise, consideration is given to the notion that dependent people are more likely to exhibit irrational behaviour, develop deeper dependencies<sup>4</sup>, self-destructive behaviours and political policies, and to contribute to a wide-array of systemic errors, such as those which exacerbate *The Tragedy of the Commons*, maladaptation, and, ultimately, extinction.

In this research endeavour, I discovered two wise and observant Icelandic economists found that the “measurements of the economic importance of the fishing industry in Iceland are also indicative of the importance of

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1 This gives me little comfort to report, as my wife was born and raised on this island, her respective families (MacDonalds and Campbells, descendants of island Scots from the Hebrides) have inhabited the island for five generations, and we presently call this island home.

2 Funk 2007c.

3 One can be independent, or one can be subject to decisions made by others... This difference, embodied in the institutional distinction between the decision-making procedures ‘market’ and ‘hierarchy’, affects individual wellbeing beyond outcomes. Taking self-employment as an important case of independence, it is shown that the self-employed derive higher satisfaction from work than those employed in organizations, irrespective of income gained or hours worked. This is evidence for procedural utility: people value not only outcomes, but also the processes leading to outcomes (Benz & Frey, pre-publication release, abstract).

4 (a) The perverse effects frequently attributed to the welfare state are easy to interpret from a behavioural perspective. If people overestimate the magnitude of immediate benefits relative to more distant ones, you can actually—on net—harm them by offering them additional immediate benefits. They already tend to under-invest. Making their present more livable with cash gifts only amplifies this tendency. Similarly, if individuals systematically overestimate their own abilities, you could easily harm a student by admitting him to a program for which he is under-qualified. Blinded by over-confidence, he would be likely to select the best school that accepted him, scarcely considering the possibility that he will be out of his league. Looking at the welfare state from a behavioral standpoint lays the groundwork for a stronger claim: Potential welfare recipients’ deviations from neoclassical assumptions tend to be especially pronounced. If the average American falls short of the neoclassical ideal, the average recipient of government assistance does not even come close (Beaulier & Caplan 2007, p 487).

(b) Once you accept the idea that you can hurt people by giving them more choices, you cannot dismiss the idea that you can help them by taking some of their choices away. In practise, of course, the latter is much more costly and intrusive than the former (Ibid, p 503).

the fishing industries in similar fish-based economies across the North Atlantic,”<sup>1</sup> and that they expect “similar multipliers to apply,”<sup>2</sup> and, based upon this insight, I presented<sup>3</sup> a strong case that the *relative* importance of the PEI fishery (that is, relative to agriculture and tourism) may in fact exert an even *greater* multiplier effect on the PEI economy: A New York food critic made a trip to PEI last fall, and his article relating this journey appeared in the travel section of the *New York Times*.<sup>4</sup> Note the article was titled *PEI: Beckoned by Bivalves*, not *PEI: Beckoned by French Fries*, also note the article's sole photograph was a lobster fishing boat in Naufrage Harbour, not a potato truck in the middle of a muddy field. Visitors to PEI go deep sea fishing, not deep potato digging, and then head for a bite to eat at *New Glasgow Lobster Suppers*, not *New Glasgow Tator Tots*, et cetra!

The essence of the relevance of this *New York Times* article is at the heart of *The Problem of Sustainable Economic Development on PEI: An increase in agricultural production translates to decreases for both the fishery and tourism* (when *The Globe and Mail* headlines *PEI's Killing Fields*, it's bad for business, of which, more to follow). A *decrease in industrial agricultural production*, however, would result in *increases* for both tourism and the fishery—not to mention lower health-care costs, tastier water, higher standards of living, lower infant mortality, greater life expectancy, et cetera!

For example, Cairns reported that

PEI's economic mainstay is agriculture, followed by tourism and fishing.<sup>5</sup>

Indeed, this erroneous conclusion appears to be held universally on PEI without exception. In fact, I have not found a single piece of economic analysis that uncovers this error. I might add, however, that Cairns was right on the mark with another, related conjecture:

The fisheries industry... *was relatively late in developing and has never gripped Islanders' culture and consciousness in the way that farming has.*<sup>6</sup>

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1 Ibid.

2 Agnarsson & Arnason 2003.

3 Funk 2007c.

4 Bruni 2007.

5 Italics mine: Cairns 1995, p 98.

6 Italics mine: Cairns 1995, p 98.

In short, gross miscalculation of the fishery resource has resulted in a disastrous economic inversion on PEI: *The tail (agriculture) is wagging the dog (fishing), and it is wagging it so hard that the dog and its owner (the islanders) are not well.*

Although our Icelandic economists<sup>1</sup> conjecture that *a more complete understanding of the true economic significance of the fisheries* may help policy makers *in Iceland*, this position may not be applicable in Canada. For example, although it seems remotely possible that this dissertation could be of some very limited use to a provincial or federal politician.<sup>2</sup> Baldacchino concurred with our position:

Of course, it is all very disturbing—and all the more so because we expect ISLANDERS to be even more aware of the eventual folly that capitalism/growth/development economics has led them to—and take appropriate action—BUT NO!<sup>3</sup>

As noted, the fundamental problem<sup>4</sup> I had identified on PEI was that its inhabitants were not willing to fight to protect their natural resources and were thus, not willing to fight to protect themselves, but, again, prior to my expeditions to Iceland, I still I did not understand *why*. A 900% increase in the application of potato fungicide over the past decade has turned the island into a very curious laboratory for the study of rare and exotic cancers (a 30% increase over the past five years). This set-up becomes even more bewildering when considering the fact that (1) potato farmers have teetered on the verge of insolvency and bankruptcy for over a decade; they receive the same price for their crop which they received 17 years ago, (2) these farmers are only able to continue to pollute the island with their cash-flow negative enterprises with financial assistance gained through democratic mechanisms (provincial and federal aid), and (3) the agricultural sector makes up only 5% of the island's voting population; yet the island

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1 Agnarsson & Arnason 2003.

2 See ABBREVIATIONS & DEFINITIONS: *Politician*

3 Personal correspondence 2007.

4 Small-island plantation economies have some structural characteristics, related to their size, which differentiate them from large continental plantation economies. Namely, they are more specialized, more dependent and less flexible than the latter. Those economic characteristics generate a particular political structure in which the plantation interest is predominant. This makes their adjustment to the present decline of some of the main traditional plantation crops difficult and painful, since most of their economic policy measures are not long-run policies to insure competitiveness, but are short-run expedients to save uncompetitive crops. The Caribbean islands, where one finds some of the oldest plantation economies, are a case in point. While the traditional export crops of the area, i.e. bananas, cane and pineapple, have been declining over the last 15 yr or so, the policies adopted by government towards the agricultural sector have proved inoperative (Crusol & Crusol 1980, Abstract).



continues to vote to, essentially, kill themselves, kill their children, and kill their economy (pesticide externalities are destroying the other two leading sectors of the economy as well: the in-shore fisheries and tourism). Though I had originally considered the possibility that the inhabitants were simply on the losing team in a game of group selection, under Dawkin's influence and a deeper reading of Darwin's original works, I rejected the group-selection premise. Furthermore, I began to suspect the constitutional mechanism, the problem of dependent people. And not only did I come to understand that dependency begets deeper dependencies, I also began to suspect that dependency begets illiteracy. Here are a few assorted illiteracy indicators: for 2008 children on PEI rank at the very bottom on national scholastic aptitude tests, a greater percentage of men on PEI smoke cigarettes than anywhere else in Canada (women are the third-highest smokers), PEI doctors are less likely to cure islander cancers than those fallen ill and treated by doctors in other provinces (which, as my friend, Dr Andy Roberts notes, likely says more about the aggressive, pesticide-induced PEI cancers than it does about the inabilities of PEI doctors), and there are more traffic fatalities per 10,000 drivers on PEI than anywhere else in Canada.

Moreover, Prince Edward Islanders are also *water illiterate*.

Wendell Berry introduced me to the concept of *Land Illiteracy*,<sup>1</sup> and I have borrowed this concept to describe a related phenomena I refer to as *Water Illiteracy*, one of the most significant problems on Earth, since

the health of the oceans depends on the health of rivers; the health of rivers depends on the health of small streams; the health of small streams depends on the health of their watersheds. The health of the water is exactly the same as the health of the land; the health of small places is exactly the same as the health of large places. As we know, disease is hard to confine. Because natural law is in force everywhere, infections move.

We cannot immunize the continents and the oceans against our contempt for small places and small streams. Small destructions add up, and finally they are understood collectively as large destructions. Excessive nutrient runoff from farms and animal factories in the Mississippi watershed has caused, in the Gulf of Mexico, a hypoxic or "dead zone" of five or six thousand square miles.<sup>2</sup>

Moreover, the amplified nature of island biogeographies renders this problem far more vexing for islanders.

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1 The principle problem is that we are "land illiterate." When it comes to "reading" a landscape, we might as well be studying a foreign language. Too many of us don't know our perennials from our annuals, what the signs of poor water cycling are, what an incised channel means, or, simply by looking, whether a meadow is healthy or not (Berry 2005, pp 164-165).

2 Berry 2005, p 7.

Regular reports of massive fish-kills numbering 10,000 or more readily make PEI headlines, generate cries for concern, and prompt politicians, yet again, to hire “consultants” search for the *cause* of problem; yes, the inhabitants reveal (through democratic mechanisms) to be utterly unable to grasp what (1) commercial agricultural production and (2) being 100% dependent upon ground water means: it means the same water feeding the fish-killing streams is feeding people-killing wells. Indeed, the water illiteracy rate on PEI is, at the very least, well-over 50%.<sup>1</sup>

Toronto’s *Globe and Mail* ran an interesting cover-story in the winter of 2006: CANCER: PEI’S KILLING FIELDS, and the article noted

PEI would be a good place to shed more light on the health effects of agricultural chemicals because areas such as Kensington have some of the highest airborne concentrations of pesticides around farm fields in the world, and a sizeable rural population literally living on the doorstep of the spraying.<sup>2</sup>

PEI is the smallest Canadian province with a population of just 130,000 people. However, due to the island’s relatively small size, it is the most densely populated province in Canada, and it is *the* most densely populated commercial agricultural region in North America. And I’m afraid this problem gets worse: PEI is also the only province in Canada that is 100% dependent on its groundwater resource, and, quite sadly, it is the only Province in Canada that does not have regulated municipal water oversight. Over one in five wells on this island pumps water into homes which fails to meet Canadian water safety guidelines (which are more liberal than FDA requirements for bottled water; in other words, you’re able to drink water at home that would be illegal to sell). More troubling is the fact that neither federal nor provincial governments test (the provincial water testing lab here on the island is the most limited provincial lab in Canada) or provide safety guidelines for pesticides<sup>3</sup>. It may be reasonable to conclude

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1 (a) See ABBREVIATIONS & DEFINITIONS: *Politician*.

(b) It may be laid down as a general rule to which there are few exceptions that, when people are mistaken as to what is to their own interest, the course that they believe to be wise is more harmful to others than the course that really is wise. Therefore anything that makes people better judges of their own interest does good. There are innumerable examples of men making fortunes because, on moral grounds, they did something which they believed to be contrary to their own interests. For instance, among early Quakers there were a number of shopkeepers who adopted the practice of asking no more for their goods than they were willing to accept, instead of bargaining with each customer, as everybody else did. They adopted this practice because they held it to be a lie to ask more than they would take. But the convenience to customers was so great that everybody came to their shops, and they grew rich (Russell 1928, p 10).

2 Mittelsteadt 2006 p 1 ; also see Delaney 2006.

3 Barlow said the big problem on P.E.I. will be an agricultural one with pesticides and nitrates leaching into groundwater.

that PEI has the lowest quality ground-water source in Canada, with the possible exception of northern Alberta (see Dominion 2007).

I will not delve too deeply into this quagmire, but consider the fact that the entire south shore lobster fishery collapsed over five years ago, and to date, focus has been solely upon the *economic consequences* of this collapse, not the infinitely more important *environmental implications* of this collapse (my conjecture, which I believe is a rather solitary position on the matter, is that this in-shore fishery was, *at the very least*, significantly weakened by pesticide run-off.

Given the fact that Sweden is often cited as a fine example of producing a lightning-fast solution to the pesticide problem, I do not suspect this discussion is of much use to Ålanders, but last winter Godfrey Baldacchino kindly invited me to lead a discourse on scientific methods for his island studies graduate course on methodology, and I delivered a discussion based upon my working paper entitled *On the Problem of Breathing, Eating, & Drinking Poison—A Brief Introduction to Problem Solving with Karl Popper on PEI in an Open Letter to Premier Robert Ghiz*, and I will forward this work upon request.

And what, you may ask, are the people of PEI doing about this grave situation?

The answer is, of course, quite naturally, *nothing*, because that is what dependent people do.

But they are fighting hard to keep their churches.<sup>1</sup>

Now that the nature of our problem has been thoroughly introduced, let's get down into the heart of the matter, the conceptual and intellectual mechanism which served as the genesis of our solution: It all began with a single word: *islandness*.

*Islandness* is a vague term, yet often summonsed by scholars. The problem of *islandness* occurred to me while reviewing *Crossing that Bridge: A Critical Look at the PEI Fixed Link*,<sup>2</sup> a work which chronicled the ten-year debate on PEI

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“For you, it will be an issue of preserving your way of life” (Stewart 2007).

1 The Roman Catholic Church on P.E.I. is preparing to close churches as congregations shrink, but participants at a public forum Thursday night were ready to fight for them (CBC 2007b).

2 Begley 1993.

which culminated in what may be honestly referred to as *a billion dollar bridge bamboozle*,<sup>1</sup> the construction of a bridge spanning the 13 kilometres from PEI to New Brunswick. The bamboozle began with rhetoric like this:

Decisions we as Islanders make on this momentous and grave matter must be the right decisions. We owe this to ourselves, to our children and to all future citizens of this province. Mr. Speaker, there is no room for error, no opportunity for second guesses and little latitude for corrective action if our planning is inadequate and unable to meet the test of time. Simply put, Mr. Speaker, we must know what we are doing [Former Premier Joseph Ghiz, 20 March 1987].<sup>2</sup>

From this auspicious beginning, Ghiz maintained throughout the ten-year process that the province would defer to, and follow the guidance of the one and only impartial *Report of the Environmental Assessment Panel*, which was commissioned and published in August of 1990. The report,

which resulted from over a year of study and public hearing into... [the] bridge proposal... is quite explicit and clear-cut about the proposed bridge: On two occasions the report said, in bold print, **“The Panel recommends, therefore, that the project not proceed.”**<sup>3</sup>

Then the great caper commenced in full force. It hindsight, it surfaced that there were considerable political incentives (and quite likely personal financial incentives) for Ghiz to build a bridge. Additional, biased reports (reports from the construction consortium which eventually was paid the one billion dollars to construct the bridge, for example) were quickly commissioned which, shocking-as-it-may-seem, supported construction, and these reports were presented to the public in the form of a balanced pro/con debate, which included a shock-and-awe media blitz campaign, peppered with yet more rhetoric:

You pay a price for progress and economic change. And I believe the best interests of the Island are served by the most efficient, modern communications with the mainland in every respect; transport, telecommunications and so on. And there's bound to be some changes as a result of this but I believe they'll be positive. *They may change the way of life to some extent but governments can compensate for this* [Elmer MacKay, Minister of Public Works 3 December 1992].<sup>4</sup>

One significant fear, as previously noted, was that the building of the bridge may lead to the collapse of the south-shore fishery, a prosperous fishery in which a fisherman could feed his family like a king, work just two months

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1 The machinations of the federal and provincial governments and the development consortium comprise a saga of deceit, dishonesty and undemocratic action (Ibid, p 4).

2 Ibid, p 1.

3 Ibid, p 6.

4 Ibid, p 6.

of the year, and could boast of owning a license worth one million dollars. The threat to this fishery was concluded by every biologist who reported on the proposal, including Irene Novaczek, the current director of the Institute of Island studies.<sup>1</sup> Within a decade after completion of the bridge, the south shore fishery, which was one of the most productive fisheries in Atlantic Canada, collapsed. All commercial species on the south shore are presently commercially extinct. And, despite MacKay's promise noted above, no such compensation has nor seems likely to be offered, as we have yet to discover a mechanism for resurrecting extinct species.

What is truly interesting and revealing in this story, however, relates back to our vague concept of *islandness*.

In *Islandness*, David Weale observed:

Economically, socially, psychologically, the construction of a *fixed link will reduce our insularity* [italics mine]. It moves in the direction of peninsularity, which as the work itself expresses, is a state of being almost an island.<sup>2</sup>

It sure seemed to yours truly, Dear Ålanders, that Weale was on to something, but unable to express himself fully. It appeared that Weale was struggling to describe an *evolutionary stable degree of relative insularity*, and mechanisms, communities, individuals, and biologies this degree of relative insularity engendered. Your author herewith suspected that Weale's fear was based upon a genetic, intuitive understanding that a drastic reduction in relative insularity represented a highly unstable evolutionary strategy.

Furthermore, I began to wonder if relative insularity could be *quantified*?

What if Weale had been able to *quantify* what this loss of insularity might mean? For example, the primary objective of building the bridge was to overcome the fundamental location-theory hindrance to PEI's *perceived* primary industry: potato farming. Quite simply, a bridge would facilitate a shift in production to the mono-crop, industrial production of potatoes. Indeed, it worked: In the decade following the bridge completion, potato production was up 700%. The problem, however, is that vicious blight fungicides also increased (900%), and thus, presently, the PEI

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1 Ibid.

2 Ibid, p 82.

“economic development plan” has generated a 26% increase in cancer rates over the past four years.<sup>1</sup>

Moreover, I began to understand that a dramatic reduction in relative insularity was indeed an evolutionary unstable strategy. In short, islanders most often fail to recognize they are Dodos, that they had evolved and adapted to live within niches of high insularity (and being a dodo, I submit, is *not* a bad thing (in fact, my preference is to live the life of a dodo), as long as dodos are able to (1) recognize what it means to be a dodo, and (2) understand that dodos require relatively high levels of relative insularity.

And so I set off, and with much strum und drang, eventually derived the formula and solution presented in our axioms (APPENDIX I).

And then I set off to map the strategic implications.

As I noted in one of Dr Nagarajan's excellent Island Studies seminars last winter, *ceteris paribus*, every RIS has two *pure* development strategies to choose from (*mixed strategies*, such as those you have successfully executed and the successful strategies executed by the innovative Japanese and Icelandic islanders are covered in the third installment to this series). Once a pure strategy has been selected and put into motion, it is extraordinarily difficult to switch development strategies once the corresponding industries, institutions, and dependencies develop and become entrenched:

<b>RIS Pure Strategy</b>	<b>Short-term (10-50 years) Payoff</b>	<b>Long-Term (30-100 years) Payoff</b>
Max Economic Development	Cash Rich/Land Poor	Cash Poor/Land Poor
Max Ecological Preservation	Land Rich/Cash Poor	Land Rich/Cash Rich

Since I intend to cover this metric in my seminar, I will say as little as possible about it for now, for a quick example by way of an illustrative snapshot, consider the biogeographic distribution of Estonian crime. Here we have 1998 figures for Estonia, the capital (Tallinn), and the far more insular island of Saaremaa:

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<sup>1</sup> Funk 2008.

	Number of crimes per 10,000 inhabitants	% of crimes solved
Tallinn	491	13.2%
Estonia	314	28.3%
Saaremaa	91	61.7%

Is this a coincidence?

When relatively insular islands pursue GEMS economic development strategies (detailed in the third installment) which lower relative insularity (building airports, hotels, bridges, commercial agriculture, manufacturing, etc.), one critical consideration (other than the obvious location-theoretical disadvantages with commercial agriculture and manufacturing) is the fact that cooperative behaviour will decrease (which will be reflected in all social behaviours, including, for example an increases in crime rates. Let us, for example, travel back in time and climb onboard the 'ol *Spray* with Captain Slocum:

It was the season for fruit when I arrived at the Azores, and there was soon more of all kinds of it put on board than I know what to do with. Islanders are always the kindest people in the world, and I met none anywhere kinder than the good hearts of this place. The people of the Azores are not a very rich community. The burden of taxes is heavy, with scant privileges in return, the air they breathe being about the only thing that is not taxed...

The day after my arrival at Horta was the feast of a great saint....The deck of the *Spray* was crowded from morning till night....On the day after the feast a kind-hearted native harnessed a team and drove me a day over the beautiful roads about Fayal, "because," said he, in broken English, "when I was in America and couldn't speak a word of English, I found it hard till I met someone who seemed to have time to listen to my story, and I promised... that if ever a stranger came to my country, I would try to make him happy."<sup>1</sup>

Presently, we'll fast-forward several months of intense theoretical development, skipping innumerable variables, insights, criticisms, and considerations which lead me to discard Iceland as the *ideal* economic model to the solution to *The Problem of Sustainable Economic Development* (though Iceland models this ideal quite well, complexities, such as geothermal resources, strategic position in the Atlantic, lack of comparative islands with a similar level of relative insularity, and the unique economic development advantages gained by the previously relationship with the U.S. armed forces, for example), and turn my focus to a smaller, more descriptive, more controlled experiment:

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1 1900, p 56.

the island of Mustique. (There are 32 islands in the Grenadine archipelago, for example, which have possess very similar levels of relative insularity, and all fall under the umbrella of the SVG government). I will also suggest we may safely pass lightly over this period since you may find the detailed desiderata relating to this intense developmental research period in **APPENDIX VIII: FIELD NOTES FROM MUSTIQUE**.

I had conducted an intensive literature review of the Caribbean, including, naturally, every one of the dozen or so papers I could find focused specifically on St. Vincent and the Grenadines and Mustique. After several weeks of preliminary research, I discovered a treasure chest, a paper out of the University College, London, which was accepted for publication in April of 1973 in what seems to this writer to be the single most appropriate Journal for any such gem: The *Biological Journal of the Linnean Society*.<sup>1</sup> This paper is F.B. Goldsmith's *The ecologist's role in development for tourism: a case study in the Caribbean*, a discourse Goldsmith had offered as a course in conservation in the Department of Botany and Microbiology:

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1 (a) The *Biological Journal of the Linnean Society* is a direct descendant of the oldest biological journal in the world, which published the epoch-making papers on evolution by Darwin and Wallace. The *Journal* specializes in evolution in the broadest sense and covers all taxonomic groups in all five kingdoms. It covers the whole range of techniques used to study evolution, including whole-organism, molecular, theoretical and practical.

The *Biological Journal of the Linnean Society* publishes papers concerned with the process of organic evolution in the broadest sense. It particularly welcomes contributions that illustrate some of the unifying concepts of evolutionary biology with evidence, either observational or theoretical, from the fields of genetics, systematics, biogeography, or ecology. The *Biological Journal* succeeded (in 1969) the *Proceedings of the Society*, the journal in which Darwin and Wallace published their seminal papers in 1858.

The Linnean Society of London, founded in 1788, takes its name from the Swedish naturalist Carl Linnaeus, whose botanical and zoological collections and library have been in the Society's keeping since 1829, having been purchased from the executor of the Society's first President, Sir James Edward Smith.

(b) Linnaeus was born in 1707... in Sweden. He began to study medicine at the University of Lund in 1727, transferring to the University of Uppsala the following year. Linnaeus headed an expedition to Lapland in 1732, travelling 4,600 miles and crossing the Scandinavian Peninsula by foot to the Arctic Ocean. On the journey he discovered a hundred botanical species. In 1734, he mounted another expedition to central Sweden....

He undertook his medical degree in 1735 at the University of Harderwijk... (which no longer exists), thence going to the University of Leiden for further studies....

In his publications, Linnaeus provided a concise, usable survey of all the world's plants and animals as then known, about 7,700 species of plants and 4,400 species of animals. These works helped to establish and standardize the consistent binomial nomenclature for species which he introduced on a world scale for plants in 1753, and for animals in 1758, and which is used today. His *Systema Naturae* 10th edition, volume 1(1758), has accordingly been accepted by international agreement as the official starting point for zoological nomenclature. Scientific names published before then have no validity unless adopted by Linnaeus or by later authors....

In 1738, he went to Stockholm to practice medicine and lecture, and became a professor at Uppsala University in 1741, attracting students from many countries to his often crowded lectures. Twenty-three of Linnaeus' students themselves became professors and this spread his methods widely, as did his extensive correspondence with leading naturalists all over Europe. He was granted nobility in 1761, becoming Carl von Linné (Linnean Society 2008).



This paper describes an advisory study conducted on the Caribbean island of Mustique prior to development for tourism. It is argued that the ecologist uses biological as well as physical indicators to assess suitability of different areas for development and to anticipate possible problems. In this study the primary environmental determinants and biological and human factors have been interpreted to identify the distribution and degree of seriousness of exposure, erosion potential and water yield and quality. The compatibility of physical and ecological factors with different categories of proposed development have been assessed, and maps of vegetation, soil and exposure transferred onto gridded overlays. The use of these overlays combined with a consideration of the compatibilities permitted the degree of restraint to the various categories of development to be presented in map form. The problems that are likely to be encountered as a result of development are discussed, and finally it is suggested that the development be subjected to regular ecological monitoring.

Upon review of this paper, I suspected I may be on to something extraordinary. The foundation to any proposed plan for RIS sustained economic development *must* begin by determining carrying-capacity, and not only did this plan indicate that the developers of Mustique had commissioned one (please keep in mind how unusual this would have been in the late 1960's), they had done so *from day one*. PEI, for example, has never conducted a carrying-capacity study.

Mustique seemed to offer one of the best possible laboratories for a relatively controlled experiment in economic development:

Thirdly, land-use is considered, and the identification of past and present demands on the area and their relationship with the existing vegetation structure helps predict future carrying capacity. The factors determining carrying capacity must be identified in order to plan and regulate future growth (Dower, 1966). These include the availability and quality of water supplies, availability of building materials, liability to erosion and exposure, the problem of waste disposal, and the environmental quality required. Many of these require specialist advice, but the ecologist is able to indicate possible environmental effects resulting from each recommendation and to predict the results of their combined application.

Not only was this paper a true treasure, the end-notes seemed to offer a map to another, perhaps even more valuable, hidden treasure:

LLEWELYN-DAVIES, WEEKS, FORESTIER-WALKER & BOR, 1970. *Mustique: proposals for a development study*. Unpubl. Rep.

Now let's consider the original, unpublished, LLEWELYN-DAVIES, WEEKS, et. al. (1970) *Mustique Development Plan*. This plan is truly extraordinary, and, to my knowledge, unprecedented, as it marks the only known instance of the ecologically planned development of an uninhabited, relatively insular island from day-one. I will also note that the document also serves as an illuminating contradistinction to *The PEI Development Plan*, which was written only one year prior (1969). These two antithetical approaches demonstrate the game matrix noted above: The PEI plan set the path for intense economic development with no regard for the ecology. The result was short-term economic gain shortly followed by both ecological and economic collapse. The Mustique plan, however, mandated ecological preservation with very little emphasis upon economic development. Again, referring back to the matrix above, it should come of little surprise that The Mustique Co. was cash-flow negative from 1958-1988! However, based upon my current estimates, this small, water-less, nearly resource-void island member of one of the most impoverished Caribbean nations, commands undeveloped (bare-land) values amongst the highest *anywhere* in the world: \$2,000,000/acre! Moreover, Mustique's ecosystem is perhaps the healthiest in the Caribbean.

Presently, my dear patient Ålanders, I will offer a surprise, optional ending, and token of thanks for travelling this far with me. It is, in essence, the embodiment of the pure RIS development strategy. It is collection of key excerpts from the original, unpublished, and naturally beautiful LLEWELYN-DAVIES, WEEKS, et. al. (1970) *Mustique Development Plan*. Although the discourse presses on following these excerpts, this preview of our conclusion for this segment may offer yet another jumping off point for readers running short on interest or time:

Since Mustique is a small island under single ownership... , development will be inherently expensive. But it will also offer the opportunity of preserving an especially high quality of environment ....

Although we have found some indications from the regional demands and projections, it is the nature of the island itself that must determine the actual quality and quantity of the potential demands that should be accommodated, firstly in terms of environment, secondly in terms of service problems and costs....

The charm of Mustique derives largely from its hilly topography. These hills, acted upon by the sea and the prevailing winds have divided the island's 1400 acres into a number of distinctly different

microclimates, and have given rise to a curving coastline that is long (12 miles) in relation to the area it encloses....

The variety of these separate places, with their interplay of forest, rocky headland, sandy bay and turquoise sea, creates an impression that makes the island seem much larger than it actually is. The hills also afford fine views of the white beaches and out over the neighbouring islands....

In order to discover the most suitable use for the land and achieve the best fit between the activities of man and the natural systems, an ecological survey was undertaken..., for it is obvious that the varied geology, vegetation and wild life of Mustique and the sea around are crucial to the attractiveness of the island....

The aim of this study was to identify areas of special interest for conservation, and to find ecological indicators for the degree of intensity and type of use for which the land is best suited....

It is necessary to ensure that no unique species or features of outstanding natural beauty are destroyed by development. Similarly the extent and variety of the vegetation on Mustique contributes greatly to the charm of the island, and must be preserved.....

Mustique is an extremely beautiful island and one which is very rich biologically. At the same time, the natural resources of the island are in limited supply or extremely sensitive to development. The challenge that must be met by the developers is to utilize its charm and habitat richness whilst maintaining its delicately balanced ecosystems in as natural a state as possible....

Several primary physical features of the island combine to determine the range of possibilities for development. These are, most notably, the availability of water, the pronounced alternation of wet and dry season, the physical make-up of soils, wind velocity, salt spray and soil salinity. These same features also determine the kind and distribution of the naturally renewable resources of plant and animal communities and, at the same time, determine their response to various kinds of development. Careful exploitation and management will be required to ensure that the biological habitat-types represented in the island's ecosystems continue to contribute to the beauty and interest of the environment...

The biotic component of the island's ecosystems is seen as a resource in its own right. It contributes to the quality of the landscape and contains plants and animals in a little-disturbed, semi-natural environment which justify conserving in their own right. It is difficult to make an assessment of the conservation status of Mustique from a scientific point of view without a more extensive survey of neighbouring islands and literature. However, it is clear that some individual species obviously deserve protection and these include the turtles and iguana. More important, in the context of the proposed future development, and as an important contribution to the island's character, is the conservation of a range of habitat types and these should include more mature areas of forest, coastal scrub, sea-grape communities, and mangrove swamp...

There appears to be universal agreement that the scenery on Mustique is superb and this beauty is derived from an interplay of forest, rocky headland, sandy bay and turquoise sea. The quality is partly the result of the small scale of this heterogeneity and the feeling of being on a small, secluded island and yet one so little exploited that an excursion to any beach or headland requires a half-day expedition. This sensation of being on both a very small and a very big and varied island is important to preserve.

Secondly there is a smaller scale of beauty and interest. This is totally attributable to biological components of the environment such as the widely distributed solitary cacti, the palm plantations, epiphytic plants, windswept distorted trees, and the occasional tortoise, humming-bird or butterfly. Thirdly there is interest that derives from past and present forms of land-use. Relics of the past include an abandoned village, Fort Shandy, Carib remains, a solitary cannon, a sugar-cane press, old wells and water-tanks. Present day activities also contribute to the interest of the landscape and most visitors will appreciate seeing cattle and ponies, fields of pigeon pea and cassava, scattered mangoes and tamarinds. citrus groves and banana plantations....

The case for maintaining and developing the agriculture of the island partly rests on the importance of preserving the feeling for the visitor of being part of a functioning system as well as to open-up views and increase diversity in the landscape....

Most visitors would appreciate interpretative facilities to enable them to understand more of the variety and richness of the flora, fauna and history of the island. We suggest that an information centre be provided and short, self-guided nature trails from natural focal points such as beaches and the lagoon. These should not be *too* arduous and should provide an alternative route back to the starting point....

Mustique is a special and unusual place. The natural resources of this beautiful island must be safeguarded, and all development carefully designed to complement the landscape. We have tried in this report to create a planning framework of which the principles are comprehensible as a kind of language of "the way things are done here".

In this report we have particularly concerned ourselves with the relationship between peoples and places. We feel that for the charm of the present day Mustique to grow into a special identity that can be comprehended by people arriving on the island, the development of tourism must be seen to enhance the landscape and benefit the local islanders. Only if the planning framework is administered by people who care about this, will visitors wish to belong there and participate in the island's plan for growth. For when people belong to a place and feel that they can interact with it, the place will grow fruitfully. We hope that the principles outlined in this report, both physical and methodological, will help ensure a harmonious and profitable future for Mustique.<sup>1</sup>

For those signing off, thank you and farewell!

For those hearty wayfarers marching on, thank you, naturally, too; let's press on without further ado:

For the sake of brevity, we'll simply indicate that the Mustique Development Plan represents a nearly ideal application of the *Funk-Zweikampf* solution for dominant RIS economic development strategy, and thus represents a qualitative description of one half of the complete *Funk-Zweikampf Solution*, our solution to *The Problem of Sustainable Development*. Again, the other half of this solution, the GEMS development strategy – though outlined in our axioms, is detailed in our third discourse.

Presently I will emphasize that *The Funk-Zweikampf Solution* was largely achieved on Mustique through (1) Colin Tenant's initial vision and *privatization*, (2) the acquisition of *asymmetrical rights*, (3) two independent men named Money-Coutts and von Neumann, (4) the commissioning of a comprehensive *ecological* development plan, (5) the prudent, evolutionary stable management and execution of this development plan by the Hon. Brian Alexander, and, presently, (6) the relative insularity protected, fostered, and insured by the controlling partners of The Mustique

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<sup>1</sup> pp 7 – 43.

Company.

Given the inherent weakness in constitutional construction (national constitutions were all drafted without considering the possibility that natural resource consumption could outstrip natural resource renewal), a democratic majority will invariably choose present consumption over future preservation and inevitably degenerate into *The Tragedy of the Commons*. Brian Alexander was kind enough to offer a critique of my positions regarding Mustique (see APPENDIX VI), and his single, yet fundamental critique was that Mustique's success was only possible with extraordinary capital reserves. I completely agree that, given media's extraordinary influence upon human rationality and behaviour, it may be very difficult to accomplish this otherwise today, but there is another way: A relatively insular population of cooperative<sup>1</sup> agents must either have (1) excess capital/natural resources at their disposal, (2) be willing to choose to live with *much less conspicuous consumption and conspicuous leisure*<sup>2</sup>, and/or (3) willing to amend constitutions accordingly.

The Hawaiian archipelago offers an excellent example of this solution. Although, our theory of value suggests that these islands are naturally endowed perhaps the highest level of relative insularity on Earth, decades of hyper-intensive development and rapidly diminishing levels of relative insularity have sparked some of the highest crime and drug addiction rates *anywhere* in the United States. This archipelago, however, also demonstrates that a homogenous, close community of independent, self-sufficient, cooperative individuals (in this case the residents of Molokai), may elect to fight to retain high levels of relative insularity. Consider the remarkable story of Molokai, reported Sunday, March 30, 2008:

Molokai, the least-touristy of the major Hawaiian islands, is about to lose much of what little tourist infrastructure it had.

After a five-year battle with island residents over the construction of luxury beach homes, the owners of Molokai Ranch said they would cease all operations Monday and would "mothball" the 22-room Molokai Lodge, the 40 "tentalows" at the Kaupo Beach Village and the 18-hole Kaluakoi Golf Course, among other

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1 The word cooperative is used because the two individuals are supposed to be able to discuss the situation and agree on a rational joint plan of action, an agreement that should be assumed to be enforceable (Nash 1953, p 128).

2 See Veblen 1899.

properties.

They also planned to shut down their 60,000 acre cattle ranch and lay off 120 employees.

"The decision is purely a business one," said Peter Nicholas, chief executive officer of Molokai Properties Ltd., in a press release.

Last year, as island residents sought to block the plan to build multimillion-dollar beach homes, a Molokai Ranch spokesperson warned that the opposition could force it to shut down entirely.

"We don't think this is a bluff," said Terry Vencel, executive director of the Maui Visitors Bureau, which oversees tourism on Molokai. "We think it's for real, and that's what we're preparing for."

The closure of the Molokai Ranch properties leaves only about 100 rental units on the island - the Polynesian-style Hotel Molokai and a handful of small condominium complexes, all in the town of Kaunakakai.

Tourism has never managed to gain a solid foothold on the island that dominates the view from Kapalua on Maui. Even plans for visits by cruise ships have sparked protests by some island residents.

But Molokai has always welcomed visitors willing to take the island on its own terms, sharing a relaxed lifestyle that doesn't move to the rhythms of large commercial resorts. It attracts those looking for a glimpse of Hawaii as it was before it was colonized by the Hyatts and Hiltons.

Last year National Geographic Magazine ranked Molokai the sixth-best island in the world (in terms of sustainable development), citing its "rugged coast and minimal beach-front preventing big-resort development and protecting Hawaiian cultural ways." It was the only Hawaiian island to make the top 10.

It may be fair to state that the overwhelming continental economic doctrine practiced and preached on RIS has been detrimental for RIS, GEMS, and thus the entire planet. I will briefly note that I have departed from the generally accepted usage of SIDS<sup>1</sup> due to the potentially misleading connotation this acronym may confer: this designation freights the similar, vexatious connotation that "third-world" carries (I have yet to discover evidence of a second-world), and personally, I find it more useful and far more honest to refer to contrasting economies and ecologies as "over-developed" and "relatively pristine." *Small Island Developing States* seems to impart the connotation that so-called *economic development* is lacking, necessary, and/or a foregone and necessary conclusion whereas, when

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<sup>1</sup> Small Island Developing States (SIDS) include low-lying coastal countries that share similar sustainable development challenges, including small population, limited resources, remoteness, susceptibility to natural disasters, vulnerability to external shocks, and excessive dependence on international trade. Their growth and development is often further stymied by high transportation and communication costs, disproportionately expensive public administration and infrastructure due to their small size, and little to no opportunity to create economies of scale.

empowered with a theory of value based upon relative insularity, this is almost always *not* the rational, dominant economic development strategy for RIS. Indeed, it is a significant challenge to find a single working paper or journal article that does *not* prescribe RIS remedies *as if these relatively small islands and “poor nations” (“poor” in terms of GNP, that is) had the continental resources and warfighting capabilities necessary for the successful deployment of such economic agendas!* Moreover, these so-called remedies are being prescribed without taking into consideration the true value propositions the *relative* riches RIS generally possess in their pristine, undeveloped states: pure water sources, no pollution, cooperative behaviour (and thus low crime rates), independent, self-sufficient inhabitants, cultural homogeneity, relatively high life expectancies, relatively happy inhabitants, etc.

Consider the following conjecture:

Small Island Developing States (SIDS)... share similar sustainable development challenges, including small population, limited resources, remoteness, susceptibility to natural disasters, vulnerability to external shocks, and excessive dependence on international trade. Their growth and development is often further stymied by high transportation and communication costs, disproportionately expensive public administration and infrastructure due to their small size, and little to no opportunity to create economies of scale.

Now consider our alternative conjecture:

Relatively Insular States (RIS)... share similar sustainable development *opportunities*, including small population, limited, *unpolluted* resources, remoteness, relative *immunity* from economic development vulnerabilities (shocks which result from excessive dependence on international trade). Their natural resource preservation is facilitated in part by economically infeasible high transportation, communication, and infrastructure costs (and thus these costs are not elected and *not* incurred) associated with GEMS development strategies. Thanks to their small size and little to no opportunities for economies of scale, pollution, crime, trade dependence, and other related negative externalities are generally avoided.

Most of the institutionalized free-trade, maximum economic development-focused development plans were put into play on islands (especially the Caribbean) and in other small, developing economies during the late 60's (such as the PEI development plan) and early 70's, popularized by influential theorists such as William G. Demas. This continental approach is great for short-term growth, but disastrous for long-term sustainability. Without exception, UN economic working papers directed toward the economic development of insular economies continue to exhibit dysfunctional ignorance of this issue. And this amplified and continues to amplify the situation, since “the UN is the

most important international organisation for all small states,”<sup>1</sup> as the Commonwealth Secretariat reported in their aptly (and erroneously) entitled *Overcoming Vulnerability: A Future for Small States*. Briguglio's *Small Island Developing States and their Economic Vulnerabilities* demonstrates how a continental economic approach utterly fails to grasp the counter-intuitive island-based value of insularity: “SIDS... face special disadvantages associated with small size, insularity, remoteness.”<sup>2</sup>

Briguglio imparts that “the idea of constructing a vulnerability index developed in international fora during discussions dealing with the *disadvantages faced by island developing countries*,”<sup>3</sup> and it was in fact this fundamental error, the *inability to see the extraordinary long-term value in small size, insularity, remoteness, inaccessibility, etc.* which inspired the author of this discourse to formulate an economic *Theory of Value* based on relative insularity.

Briguglio et al.<sup>4</sup> have been churning out these papers for decades for the UN and so-called SIDS, and their influence has been extraordinary. On his home island home of Malta, for example, Briguglio teaches economics at the University of Malta, directs the “Islands & Small States Institute,” and continues to generate and broadcast his fatally flawed approach to students, the UN, the World Bank, and beyond: “Professor Lino Briguglio... was commissioned... by the World Bank and the Commonwealth Secretariat to write a report on the strategy that small states *should*<sup>5</sup> adopt in the coming years.”<sup>6</sup> Indeed, Malta has followed and adhered to a Continental economic

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1 p xii

2 1995, abstract.

3 Ibid, p 1615.

4 For example, see: Fischer & Encontre, 1998.

5 Note this normative assumption.

6 (a) Professor Lino Briguglio, the Director of the Institute, was commissioned, together with Professor Bishnodat Persaud and Mr Richard Stern by the World Bank and the Commonwealth Secretariat to write a report on the strategy that small states should adopt in the coming years. The [2006] report is entitled 'Toward an Outward-Oriented Development Strategy for Small States: Issues, Opportunities, and Resilience Building' (UM 2007, p1).

(b) *Conclusions and Recommendations*. Taken together, the above challenges suggest that efforts to prolong reliance on preferences do not have promising or productive prospects. Instead, small states should shift their attention to designing and implementing aggressive outward-looking export based development strategies. Indeed, for preference-dependent small states, nothing less than a repositioning of their economies is required. This entails increased emphasis on efforts to exploit and create comparative and competitive advantage in the service sectors, including tourism, finance, insurance, health, education, internet services, and e-commerce, while at the same time not neglecting scope for competitiveness in other sectors, including agriculture and niche markets. By their nature, the service sectors are less vulnerable to the high transport and other infrastructure costs faced by many remote small states, and, in contrast to traditional commodity exports, have robust long term market prospects. However, scale disadvantages, especially for the very small states, remain



development approach since gaining independence:

Within the United Nations, the issue of the special problems faced by island developing countries was first specifically raised during UNCTAD III in 1972, where the focus of attention was the disadvantages associated with insularity and remoteness. Subsequently, other fora within UNCTAD identified additional disadvantages peculiar to island developing countries. By 1988 a wide array of such disadvantages were recognized, as evidenced by a comprehensive document prepared by UNCTAD in preparation for a meeting of a group of experts on Island Developing Countries, held in Malta in May 1988.<sup>1</sup> The deliberations of the Malta meeting led to a UN resolution recognizing that in addition to the general problems faced by developing countries, island developing countries suffer additional handicaps arising from the interplay of such factors as smallness, remoteness, geographical dispersion, vulnerability to natural disasters and a highly limited internal market.<sup>1</sup>

And to be sure, Malta is regularly cited as an *extraordinary economic development success story*.

But it has been neither a success nor a failure, for a sufficient time series has not yet come to pass. Although some may see success, I submit this is the problem of myopia: in terms of geologic time, even in evolutionary time - Malta has not been successful for *any* significant time at all. And Malta's future prospects seem rather unappealing: with a population several times over the island's carrying capacity, no fresh water, and a mountainous landfill which dominates the landscape (visible from *all* vantage points on the island!), Malta appears to teeter upon its breaking point. Briguglio's emphasis is misguided, for his approach leads to continental economic solutions and consequences: short-term economic gain and long-term, ecological *and* economic destruction. RIS face very special, counter-intuitive *advantages* associated with small size, insularity, remoteness! The free-trade continental economic development plan is certainly taking a serious toll on the Caribbean (indeed, the value proposition in the Caribbean diminishes daily, and, the problem is, there's no turning back now; these economies are *dependent* upon the economic activities which are rapidly driving the majority to ecological (and, naturally, economic) ruin.

Take for example, a paper delivered as the third *William G. Demas* Memorial Lecture at the Caribbean Development Bank by José Antonio Ocampo, Executive Secretary, Economic Commission for Latin American and the Caribbean in the Cayman Islands, on 14 May 2002:

*These trends suggest that very small developing states are able to strive and compete internationally on the basis of a*

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significant, and will require special attention (Briguglio 2006, p v).

1 Briguglio 1995, p 1615.

*narrow specialization*, based on their natural advantages. For developed countries, the size of the domestic market is no longer an obstacle for building up a modern economy and successfully competing in international trade, as the example of small European countries indicates (p 6).

Yes, *trends* have suggested a great number of irrelevant things to many misguided individuals, including the correlation between sunspots and corn prices,<sup>1</sup> and film revenues and sub-atomic particles,<sup>2</sup> and this magic trick is especially easy to pull off since economics, as we have asserted, has had no a *meaningful* theory of value. This Demas Memorial lecture embodies perhaps the most common misguided mantra: given diseconomies of scope and scale, *you must find your niche*, or simply, *specialize*. I must report some very important news: That is bad advice. For every success lies a hecatomb of failure, and what few success stories there are typically *over* not long after they're discovered. *A Taste of Small-Island Success: A Case from PEI* captures the essence of this problem:

Smallness and insularity have been traditional markers for the absence of economies of scale, viable markets, labour power and expertise, and business know-how. Loaded with such structural handicaps, small-island societies often are seen as clearly doomed by the accident of geography to eke their way as bastions of protectionism and as targets of interventionist bale-out and hand-out programs.<sup>3</sup>

The spirit in this paper is on track—for it represents a quest for the elusive unicorn known as 'Sustainable Economic Development'—but the sound logic and methods of the theorems of continental economics backfires on islands. Consider: *Small-island societies often are seen as clearly doomed by the accident of geography*. This notion is widely

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1 Jevons' romance with statistical investigations unfortunately carried him to the most fanciful and, unfortunately, the most ridiculed idea of his life, the explanation of commercial crises on the basis of the periodic alteration of spots on the sun. The "sunspot theory" integrated Jevons' earlier work on the prices with his lifelong interest in astronomical and meteorological phenomena. In "The Solar Period and the Price of Corn" (1875), he put the matter succinctly:

If the planets govern the sun, and the sun governs the vintages and harvests, and thus the prices of food and raw materials and the state of the money market, it follows that the configurations of the planets may prove to be the remote causes of the greatest commercial disasters (Ekelund and Hebert 1997, p332).

2 (a) Hayek (1991) lamented the difficulty in distinguishing between economics and excrement, and Hemingway (1958) noted "The most essential gift for a good writer is a built-in, shock-proof, bullshit detector." In this spirit and within the context of Frankfurt's (2004) *Theory of Bullshit*, this paper constructs a bullshit detector for economics. This apparatus is carefully calibrated to detect the Seven Deadly Sins of 'Hollywood Economics': Hubris, Intellectual Dishonesty, Greed, Mathematical Mania, Physics Fetishes, Conditions of Emptiness, and Sunspots. We trace the philosophical and methodological origin of these traits to its source, *The Problem of Induction*, then illustrate with examples from Plato to the present, including detailed analysis from the illuminating cases of Long Term Capital Management and William Stanley Jevons' sunspot theory. Furthermore, we demonstrate the contemporary effectiveness of this apparatus by detecting hereto undetected economic bullshit, namely Arthur de Vany's (2004) *Hollywood Economics: How Extreme Uncertainty Shapes the Film Industry*. In the process, we falsify de Vany's 'Nobody knows anything' theory and advance our replacement theory: George Lucas knows something (Funk 2007b, abstract).

3 Baldacchino, 2002, p 254.

held because, from a *Continental Economics* perspective, it *is doomed!* And yes, quite naturally, *The PEI Preserve Company*, that savvy, successful, resourceful firm that, against all odds, *found its niche...* filed for bankruptcy in May of 2007.

However, from an *Island Economics* perspective, small-island societies are clearly *saved* by the *miracle* of geography, by the miracle of *insularity*. How are they saved? By realizing it may be better *not* to find your niche!

When RIS recognize with the *true nature, reality, and rationale* of the *insular geographical* cost/benefit equation: *insulation from* violent crime, *insulation from* toxic externalities (including both industrial and consumption based externalities, such as traffic noise, pollution, and congestion), cooperative, other-regarding behaviour, innumerable intangible and unquantifiable benefits from insularity and living close to the land, and, *ceteris paribus, less potential for monetary gain, fewer employment opportunities, and less significant economic development possibilities!*

Although I refuse to assert what one should or should not do, that's the dominant, pure RIS strategy, take it or leave it! (Again, however, a mixed strategy is another story: imagine, if you will, a relatively insular island in the Baltic Sea, which happens to have leveraged a competitive, geo-strategic advantage: its position between Sweden and Finland. The dominant, mixed strategy for economic development *on* these particular islands is simply a pure RIS strategy. However, the dominant, rational economic development *off* the island is a pure GEMS, maximum economic development strategy: Transport as many tourists possible, sell as much alcohol as possible, sell as many duty free goods as possible, ship as many containers as possible – and let these and related businesses grow naturally, and make certain as few negative externalities as possible land *on* the islands. When a corporation on the relatively island of Japan wanted to be the number one pick-up truck manufacturer in the world, they did not build the plant on Japan, they built it in the middle of Texas. *RIS may effectively employ GEMS strategy when they are able to execute the strategy in a GEMS territory* – this is the essence of our dominant mixed economic development strategy.)

Insulation from toxic externalities is a fairly straightforward value to understand and appreciate, but I will briefly hint at the extraordinary value other-regarding behaviour has to offer. Other-regarding behaviour, it is well

understood, increases as eye-to-eye contact increases, thus, *ceteris paribus*, other-regarding behaviour increases as the size of an island decreases (and population density increases), and as Stiglitz<sup>1</sup> noted:

As in Darwinian ecological models, the major determinant of one's environment is the behaviour of others, and their behaviour may in turn depend on their beliefs about others' behaviour... As Darwin noted after his visit to the Galapagos:

How has it happened in the several islands situated within sight of each other, having the same geological nature, the same height, climate, &c... This long appeared to me a great difficulty: but it arises in chief part from the deeply-seated error of considering the physical conditions of a country as the most important for its inhabitants; whereas it cannot, I think he disputed that the nature of the other inhabitants, with which each has to compete, is at least as important, and generally a far more important element of success.<sup>2</sup>

I should also highlight that the aforementioned *intangible benefits from relative insularity and living close to the land* are unquantifiable because, as we will soon consider, economics does not offer a *Theory of Value*. For example, when a fisherman on the north shore of PEI takes cod or lobster or mackerel from the sea, handles them with great care (using only a trap or a line and his or her own two hands), then brings home, cooks them, and feeds them to the family within three hours time, how much is that *worth*? First of all, in terms of National accounts, it worth nothing, as it is generally not accounted for. Secondly, no British queen, no Saudi prince, no Manhattan media mogul can acquire such a meal *at any price*. Certainly, they may have the means to procure a great French chef schooled in extraordinary sauces, and although it will not be readily apparent when the sterling silver dome is lifted from the antique Chinese porcelain, it will be almost certain that, beneath the sauce lies a 'fresh' sockeye salmon (for example) that was caught at least three days prior, sat in the sun for several hours on the deck of a boat in the mouth of the Naknek river, sat in hold of a shore-based processor for 12 to 18 hours, was processed by many relatively indiscriminate hands along a conveyor belt in a processing plant in King Salmon (or Dutch Harbour or Kodiak), flown to Anchorage, flown to Los Angeles, flown to London, then arrived at the marketplace where the *Le Cordon Bleu* trained chef procured it and took it to the palace to prepare a sauce succulent enough to mask any hint of foul taste or

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1 2001, p 521-522.

2 Darwin 1859, p 400, also see Fehr & Fischbacher 2004 ; Fehr & Rockenbach 2004.

odour.

Coming to grips with this hereto unquantifiable *asset* (unquantifiable, that is, until we employ our theory of value) is critical to coming to grips with the essence of sustainable economic development. If these ecological resources are lost or diminished, the economic loss is equally unquantifiable, but almost certainly catastrophic: RIS lose the primary advantage they truly possess (Ferrer-i-Carbonell & Gowdy 2007). Consider the collapse of the Newfoundland cod fishery, for example. Economists have *mistakenly* valued the collapse of one of the most valuable fisheries on earth at approximately \$30 Billion CAD. Imagine, for the sake of this example, that Warren Buffet had endowed the people of Newfoundland with \$30 Billion CAD instead of endowing it to the Bill and Melinda Gates Foundation: Would this endowment offset the loss? For one, I submit this endowment would have *actually made things worse*, (by begetting greater dependency), but what we're considering here is that \$30 Billion CAD doesn't remotely approximate the collapse of perhaps the most valuable fishery on earth; to do so would require a valuation of life on earth, because in losing this fishery we have lost life on earth, the prospects of our collective survival are thus also diminished. Also, speaking regionally, \$30 Billion CAD would not come close to compensating thousands of families whom have lost *generations of social learning*. Fishing knowledge, seamanship, navigation, and survival skills in general, which were acquired over the past three hundred years, will not be passed down to future generations in Newfoundland. A dramatic loss of evolutionary fitness has also befallen the people of Newfoundland. I'd be curious to see an economist attempt to quantify that.

If we accept Axiom I (see Appendix I), as time moves forward, the few RIS willing to employ our counter-intuitive *Theory of Value* (meaning an economic sacrifice in the present for economic and ecological value in the future), stand to watch the value of their ecological assets increase and become ever-more sought after as healthy, inhabitable environments, tourist destinations, etc. Why is tourism the largest industry on Earth? Because humans consistently reveal a preference for relative insularity: An investment banker struggles and pays a heavy physiological price for toiling on the insignificantly insular island of Manhattan, then gladly trades hard earned dollars for relative

insularity: two weeks of the year in Hawaii, a house in a *gated-community* in Connecticut, a summer house in the Hamptons, a *private* school for genetic offspring, etc. Quite often, however, the highly sought-after relative insularity proves to be an illusion. Although our investment banker may not (yet) be able to quantify it, somehow he feels his week in Barbados or Bermuda or Key West didn't offer the insularity he was looking for. In fact, he feels that he needs a vacation – *he needs to get away from it all* – more afterwards than before. Indeed, *if he had been able to run the numbers*, he may have actually discovered that Manhattan offers greater relative insularity than Key West and Bermuda and Barbados! But he'll need our theory of value based upon relative insularity before he's able to run those numbers.

When islands chase continental economic mirages, such as the pursuit of commercial agriculture (CBC 2007a, CBC 2007c), sooner or later, they lose money *and* the benefits their island ecology once offered: through amplification-by-compression, they experience *greater* pollution-related effects than continental counterparts, and do not have other industries to fall back on, unless, that is, they are unfortunate enough to have a co-dependent federal parent willing and able to enable their march down the road to self-destruction.

In *On the Problem of Dependent People: Natural Resource Valuation Errors in Atlantic Canadian Island Jurisdictions*,<sup>1</sup> I noted the largest bankruptcy in PEI history (-\$24 MM CAD) was a welfare-funded (Ottawa) fish-plant which was built, of course, with the mad delusion of *stimulating economic growth*. I added that 'Delusion' may not even be a strong enough word for it, because rational agents would not build a plant to process a fishery that it was simultaneously endeavouring to destroy. Three years ago, the Federal government also funded a beef plant for this dependent province, which has lost \$12 MM CAD to date. Unnaturally, but quite like the parent of a dependent child who has become unable to stand on his or her own, the federal government recently bailed this plant out as well. I added that, although I refused to commit the prosaic *Economists' Error* of issuing predictions,<sup>2</sup> I wouldn't be surprised if these doors

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1 Funk 2007c.

2 The assumption that *economists* (italics Hayek's) can find predictable solutions to economic problems is undoubtedly the most inhibiting force in... economics. It has led to the increasing isolation of theoretical economists from the day-to-day practitioners of the subject—the

close soon as well. And as it turned out, I was right, they did.

The simple solution for pure RIS economic development is this: Do as little as possible, disturb as little as possible, foster the healthiest environment possible, for that *is* and *should always* be an island's greatest asset! This prescription is not a call to return to the dark ages, but a call to scrutinize, very carefully, what industries, what economic development projects, imported goods, &c are actually required for (and promote) a relatively high standard of living. In most situations, island governments *should* represent small, manoeuvrable speedboats amongst an armada of cruise ships (continental bureaucracies), and be thus able to provide unusual, perhaps even radical protection and benefits that continental analogues can not (due to the extraordinary property rights proxied to corporations and their lobbyist). For example: what are the costs and benefits of cigarette consumption? The strain on the healthcare system alone is onerous, and every additional export carries high externality costs. People will emigrate; that will actually *help*. With very little assistance (but a great deal more environmental protection) the island will reach its bio-equilibrium (for all species, including humans): “Institutional adaptation and resource conservation can be critical in achieving population stability” (Erickson & Gowdy 2000, abstract). Worried about so-called *brain-drain*? Brain drain is exactly what you want, since these *brains* have been schooled in the principles of continental economic development. Staying home and practicing what they've been taught will likely make matters worse! The only cure is to teach the principles of island economics, the value of relative insularity, the value of independence, and the value of self-sufficiency. Otherwise, they're better off – for themselves, the island, their fellow islanders, and the world at large – practicing what they've been taught on the island of Manhattan.

Moreover, scaling down instead of up inhibits financial shocks. During the late-1920's and 1930's here in PEI, for example, when approximately 50% of the 100,000 inhabitants were small-scale, sustenance farmers and fishermen: While the rest of North America spiralled into the Great Depression, *island life* marched forward in a farming-and-fishing-as-usual fashion, well *insulated* from the effects of the depression. Those independent islanders

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actual participants in an economy, the consumers and the producers (Hayek, Bartley, & Kresge, 1991, pp 8-9).

were more than able to make it on their own. This finding was initially based upon conversations with north-shore fishermen, including my father-in-law, Ronald Campbell, who has fished off the north shore for the past 50 years; his father fished, farmed, and lived a comfortable, almost entirely subsistence-based (including barter) life on the north shore throughout the depression (also see Larkin, 1990). More recently, however, it was confirmed by Steward Shepherd, one of the five economists hired to develop and write the PEI economic development plan of 1969. Shepherd noted the plan was initiated, essentially, because *per capita income* was lower on PEI than in the other provinces of Canada, *but life expectancy and the standards of living were not lower*. This is the crux of the problem: per capita income was almost completely irrelevant because economic had no *theory of value*. Shepherd, whom I have discovered to be a truly wise economist and a gentleman, readily concedes the PEI development plan failed to consider ecological factors. And although he was almost entirely correct when he rightly defended this error by noting that there weren't any economists on Earth factoring ecological considerations in 1969, there was one economic development plan being drafted – nearly concurrently with the PEI plan – which did: The Mustique Development Plan.

But let's return to PEI for a moment. If, let us consider, hypothetically, a North American financial shock approximating the magnitude and duration of Great Depression occurred tomorrow (which, contrary to popular belief, becomes *more likely* as time moves forward),<sup>1</sup> the present-day, *dependent* inhabitants of PEI may be more predisposition to starve right along with the rest of the continent; in fact, it is likely much of the island population (primarily the 97% of the population who no longer fish nor farm (edible and thus barterable produce *other* than potatoes) would fare far poorer than the significantly more affluent and *perhaps* more liquid (and thus more mobile)

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1 (a) Ever since the beginning of modern science, the best minds have recognized that 'the range of acknowledged ignorance will grow with the advance of science.' Unfortunately, the popular effect of this scientific advance has been a belief, seemingly shared by many scientists, that the range of our ignorance is steadily diminishing and that we can therefore aim at more comprehensive and deliberate control of all human activities. It is for this reason that those intoxicated by the advance of knowledge so often become the enemies of freedom... The growth of our knowledge of nature constantly discloses new realms of ignorance... The more men know, the smaller the share of all that knowledge becomes that any one mind can absorb. The more civilized we become, the more relatively ignorant must each individual be of the facts on which the working of his civilization depends (Hayek 1945).

(b) Also see Buffet (2003), Danielsson (2000), and Shiller (2000).



continental counterparts.

Consider the fact that

the 17<sup>th</sup> century saw several attempts to develop the PEI fisheries through grants made by the French crown for monopoly fishing or sealing rights... *Because of PEI's remoteness, its poor north shore harbours, and political squabbling, none of these projects was ever realized.*<sup>1</sup>

Now I am able to truly illustrate the counter-productive and destructive nature of employing continental economic development strategies on RIS. From an *Island Economics* perspective, this was actually an *economic miracle*. The relative access to the deep water harbours on PEI's south shore have helped turn the Northumberland Strait into a lifeless sewer, but the *poor north shore harbours have preserved* the north shore's ecology *and* its economy! PEI's most productive fishery, most desirable tourist destinations, most desirable (and valuable) real estate, most healthy watersheds (and thus most pure domestic well-water), are a direct result of these *poor north shore harbours!*<sup>2</sup>

The world-class, economically viable, deep-water harbour in St. John's, Newfoundland served as a fantastic port to facilitate all kinds of rapid growth and development, including a manufacturing facility for factory trawlers. The harbour was so economically stimulating, in fact, that Canada was able to fish the most productive cod fishery on earth to commercial extinction.

The inverse situation, meanwhile, played out to the north:

Compared to Newfoundland, Iceland's domestic fisheries remained at very low levels of effort and catches until the early 20<sup>th</sup> century... In the period 1905-1909, Icelandic groundfish landings averaged only 48.4 thousand metric tonnes, or about a quarter of those of Newfoundland.<sup>3</sup>

So, you may wonder, as a naturalist, explorer, economist, strategist, problem solver, and living organisms, fully engaged in his own *struggle for life*, what insight might I offer the Ålanders pertaining specifically to Ålanders challenges?

Well, I trust that you have already found my discoveries on other islands have helped framed struggles of your

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1 Arnason & Felt 1995, p 101.

2 Benson, Van Leeuwen, Sanchez, Dohoo, & Somers 2006.

3 Jónsson 1995, p 271.

own. Other than that, I should say as little as possible. Though I believe I have gained a rather thorough working knowledge of island life on PEI, I have been living on this island for three years now, and it seems I had merely scratched the surface after one year, and came to understand economic, biogeographical, geological, political, constitutional, psychological, and evolutionary mechanisms, and the role of relative insularity after two years. Thus, at *this* juncture, most of what I have to offer Ålanders are the trials, tribulations, successes, and failures I've observed on *other* islands, because the highly idealized methodological approach I have adopted began with Alexander von Humboldt and the great explorers he has inspired,<sup>1</sup> and thus, like these restless searchers, I believe that

only through travel, despite its accompanying risks, could a naturalist make the diverse observations necessary to advance science beyond dogma and conjecture. Although nature operated as a cohesive system, the world was also organized into distinct regions whose unique character was the result of all the interlocking forces at work in that particular place. To uncover the unity of nature, one must study the various regions of the world, comparing and contrasting the natural processes at work in each.

The scientist, in other words, must become an explorer.<sup>2</sup>

Thus, once again, I look forward to exploring Åland. And if I should happen discover a few upon your shores – as I will endeavour to do – I will be pleased to turn over what I find.

In the meantime, however, I will merely offer a few preliminary ideas which I have formulated from afar. In short, hold your course, do as you have done throughout the centuries: follow your instincts, maintain your fierce independence, interfere with the evolutionary process as little possible, but do everything possible to maximize ecological preservation and resist all temptation for economic development which compromises the ecology in any way. Also, I will suggest Ålanders helped *teach me* the dominant mixed RIS/GEMS economic development strategy: situate negative externality intense economical development capital investments *on the sea* and on *other* shores. Las Vegas gladly receives gambles from all 50 U.S. states and nations all around the world, but as for the heavy negative

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1 In the vast army of those who felt Humboldt's impact, perhaps one stands out above the others. He was a young, dreamy British naturalist who was so moved by Humboldt's accounts of his journey that he committed whole passages to memory and longed to make a similar voyage one day. When he was offered a post aboard a ship of scientific discovery in 1831, the young man quickly accepted, packing in his seabag his copy of Humboldt's Personal Narrative. The ship was the *Beagle*, the young man Charles Darwin (Helferich 2004, p xx).

2 Ibid, p 27.

social externalities (gambling, drug, and alcohol addictions, quite literally *the gambler's ruin*), Las Vegas largely defers these costs to the gambler's homeport to contend with. The province of PEI, for example, in yet another attempt to apply continental economic principles on a relatively small island, constructed an enormously expensive harness racing and gambling complex. Needless to say, it has bled dollars since day one and will never turn a cent of profit. To make matters worse, the province sought to off-set losses by adding slot-machines. When this proved insufficient to ease the haemorrhaging, it added card tables. Not only is the "Racino," as it is deftly branded, still losing money, if some great misfortune should bring you to PEI and you should happen to pass through the Racino doors, you will pay witness to a macabre PEI, day-of-the-dead, smoking, EI (welfare) nightmare reminiscent of Michael Jackson's *Thriller* video. The only customers losing money at the Racino are the already down-and-out Inhabitants of PEI, and upon their homeport's doorstep do they fall.

Needless to say, I am a bit nervous about your casino. The strategic locale for alcohol sales and casino revenues are on the battlefields of continental economic development, and that includes the open waters of the seven seas.

I will also note that two million visitors per year may be high – but then again, this figure may largely represent transit passengers who do not alight on island soil. Needless to say, I submit a carrying-capacity study and regular assessments are in order.

The fact that your per-capita income ranks so highly is admirable, but largely irrelevant - pay as little attention to this essentially meaningless figure as possible, for if it should rise to number-one, in reality you may be worse off, and if it should fall precipitously, you may in fact be better off. The best indicator of your great success is plain for all to see: Your "health statistics are good... Average life expectancy is 2–3 years higher than in the rest of Finland. For women it is the highest in the Nordic countries."<sup>1</sup> As the years pass, keep an eye on this benchmark, for, ideally, it must *always* be on the rise. If it should remain flat, be concerned. If it should fall, be alarmed. The

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1 Eriksson et. al. 2007, p 684.

basis for this conjecture is detailed in the third instalment of this trilogy, but in the meantime I would refer you to a recent, extraordinary paper out of the University of Chicago: Murphy & Topel's 2008 *The Value of Health and Longevity*. I might also refer curious readers back to Axiom I, and I might also add that human life expectancy is the figure used to calibrate values within the formula for our theory of value. I will also highlight the results from another important study:

Save the Children's ninth annual Mothers' Index compares the well-being of mothers and children in 146 countries more than in any previous year. The Mothers' Index also provides information on an additional 27 countries, 22 of which report sufficient data to present findings on children's indicators. When these are included, the total comes to 173 countries. Sweden, Norway and Iceland top the rankings this year. The top 10 countries, in general, attain very high scores for mothers' and children's health, educational and economic status. Niger ranks last among the 146 countries surveyed. The 10 bottom-ranked countries – eight from sub-Saharan Africa – are a reverse image of the top 10, performing poorly on all indicators.

Skilled health personnel are present at virtually every birth in Sweden, while only 33 percent of births are attended in Niger. A typical Swedish woman has nearly 17 years of formal education and will live to be 83 years old, 72 percent are using some modern method of contraception, and only 1 in 185 will lose a child before his or her fifth birthday....

Sweden performed as well as or better than other countries in the rankings on all the indicators. It has the highest ratio of female-to male earned income, the highest percentage of women with seats in the national government and – along with Iceland – the lowest under-5 mortality rate in the world.<sup>1</sup>

I contend that these results are more important and more revealing, especially in light of the prospect that they may begin to bring our unified theory of value for the biological and social sciences into yet sharper focus. Take a closer look at the top-ten and bottom-ten places to be a mother (and thus, moreover, to be a human):

<b>1 Sweden</b>	<b>137 Ethiopia</b>
<b>2 Norway</b>	<b>138 Mali</b>
<b>3 Iceland</b>	<b>139 Djibouti</b>
<b>4 New Zealand</b>	<b>140 Eritrea</b>
<b>5 Denmark</b>	<b>141 Guinea-Bissau</b>
<b>6 Australia</b>	<b>142 Angola</b>
<b>7 Finland</b>	<b>143 Sierra Leone</b>
<b>8 Ireland</b>	<b>144 Yemen</b>
<b>9 Germany</b>	<b>145 Chad</b>
<b>10 France</b>	<b>146 Niger<sup>2</sup></b>

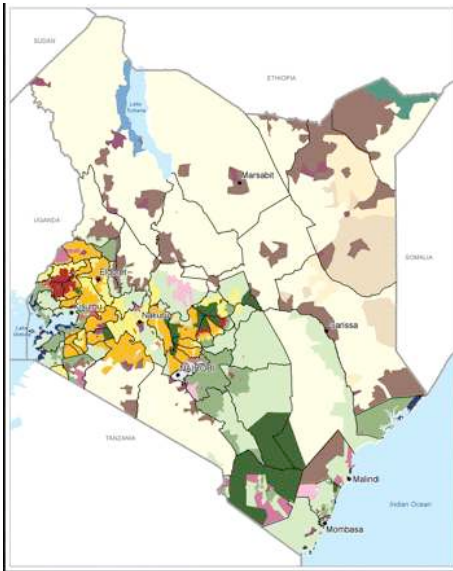
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1 SOWM 2008, p 39.

2 Conditions for mothers and their children in the bottom countries are grim. On average, 1 in 21 mothers will die from pregnancy-related causes. More than 1 child in 6 dies before his or her fifth birthday, and roughly 1 child in 3 suffers from malnutrition. About 50 percent

Is it a coincidence that Nordic countries dominate the top-ten, and African nations (especially sub-Sahara) are at the bottom?

One of the most illuminating features of our theory of value is that it clearly demonstrates that political philosophies and economic development theories are *neither* matters of personal preferences nor philosophical debate, but rather *biogeographical realities*. Please take a moment to consider the *Economic map of Kenya*:<sup>1</sup>



**Map:** *Economic map of Kenya. Poverty is not uniform across the country but depends on a host of geographic factors such as soil type and elevation. Okwi et al. analyze the effect of Kenyan geography on income.*

This map illuminates

the link between poverty incidence and geographical conditions within rural locations in Kenya. Evidence from poverty maps for Kenya and other developing countries suggests that poverty and income distribution are not homogenous. We use spatial regression techniques to explore the effects of geographic factors on poverty. Slope, soil type, distance/travel time to public resources, elevation, type of land use, and

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of the population lack access to safe water and only 3 girls for every 4 boys are enrolled in primary school. The gap in availability of maternal and child health services is especially dramatic when comparing Sweden and Niger....

At the opposite end of the spectrum, in Niger, a typical woman has less than 3 years of education and will live to be 45. Only 4 percent of women are using modern contraception, and 1 child in 4 dies before his or her fifth birthday. At this rate, every mother in Niger is likely to suffer the loss of a child and 9 out of 10 mothers are likely to lose two children in their lifetime.....

Forty-four percent of Niger's children are malnourished and 54 percent lack access to safe water. Only 47 percent of children in Niger are enrolled in primary school, and within that meagre enrolment, boys outnumber girls 4 to 3 (SOWM 2008, p 7).

<sup>1</sup> My first visits to the developing world in 1967, and a more extensive stay in Kenya in 1969, made an indelible impression on me. Models of perfect markets, as badly flawed as they might seem for Europe or America, seemed truly inappropriate for these countries (Stiglitz 2001, p 473).

demographic variables prove to be significant in explaining spatial patterns of poverty. However, differential influence of these and other factors at the location level shows that provinces in Kenya are highly heterogeneous; hence different spatial factors are important in explaining welfare levels in different areas within provinces<sup>1</sup>

Perhaps contemporary economists should beg the Austrians for forgiveness for failing to recognize the complete relevance of one of their simplest, yet most powerful insights: *Location Theory*.

I might also add that, thus based on my primary criteria for economic and biological values alike, Sweden's economy/biogeography ranks 26 places above The United States.<sup>2</sup>

And although it might seem intuitive to conclude that organisms inhabiting the Nordic region, for example, as the *lucky* winners of some stochastic biogeographical lottery, this process was far from random; and understanding this process requires an evolutionary world-view.

Ask yourself if you were *lucky* to be born an Ålander? If you simply look back to the time of your birth, or your parents' or grandparent's birth, it is not likely that the answer to this question will be readily apparent. In order to make this assessment, you must look back more than 14,000 years, to the last time the ice sheets retreated, and left the *uninhabited* region which includes present-day Sweden and the Åland archipelago free for the taking *of the willing and of the able*. At this point in time, it is likely that your forefathers were living in the same region as my forefathers: present-day Germany. And, in the great *problem solving*<sup>3</sup> endeavour known as the *Struggle for Life*, it is likely that at least one of your forefathers, perhaps a nomadic reindeer hunter, (1) made the *decision* to head for this new-found land, and (2) proved fit enough to run the gauntlet of long-distance dispersal. Have countless stochastic elements played a role in this ultimately successful migration? Of course, but it has certainly not been all – I will not even say *mostly* – based upon luck; and it has certainly not been solely influenced by biogeography. And I submit we don't need to look as far as 14,000 years in the past to see why. Consider another passage from the *Save the*

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1 Okwi *et al.* 2007 abstract.

2 The United States places 27th this year. Last year it was 26th.

3 See ABBREVIATIONS & DEFINITIONS: *Problem Solving*

*Children's ninth annual Mothers' Index:*

Sweden is one of the best places in the world to be a mother or a child, no matter one's level of income – but it was not always so. In the 1920s, the poorest babies were up to 3.5 times more likely to die before reaching their first birthday, and the child survival gap was a source of political concern. In the 1930s, the Swedish government introduced a series of new policies, including free maternal and child health services, financial support to low-income families and general welfare and housing reforms. The preventive maternal and child health services rapidly achieved extensive coverage and particularly benefited the poor. By 1950, maternal health services covered about 60 percent of all pregnant women and child health services covered more than 80 percent of infants. These reforms led to significant reductions in social inequity and infant mortality. Today in Sweden, inequity in infant mortality has been almost eliminated and Swedish children – rich and poor alike – enjoy one of the lowest rates of child mortality in the world.<sup>1</sup>

Do I mean to infer that we merely need to look to the early 20<sup>th</sup> century for the origins of this fantastic survival success story? No, but I believe the fountainhead is easily seen flowing strong yet in the 10<sup>th</sup> century:

By 1100 Denmark and Norway were largely Christianized, but in *Sweden paganism remained strong; a major cult centre continued to flourish at Uppsala, and it would be another century before the country was thoroughly Christian.*<sup>2</sup>

My mother always cautioned me when it came to discussing politics or religion amongst new acquaintances, and the prospect of this discussion becomes particularly unsettling in light of the fact that my mother and my wife are joining my Åland expedition. And although I've passed the bulk of this discourse off to the second instalment (which I'll gladly forward once I've safely returned to North America!), I'm afraid this topic is unavoidable, as to pass it by entirely would mark an error of omission. For now, I might merely suggest the late onset and half-hearted acceptance of Christianity has yielded similar, favourable events and institutions in Sweden as in Iceland:

In Iceland there were no conditions for the rise of the class society elsewhere so characteristic of the Middle Ages, with its sharp contrast between Church and people, between the learned and the peasants. There books were not, as in other lands, the privilege of a few priests versed in Latin. Even in the Middle Ages literacy was far more widespread among the common people in Iceland than in other parts of Europe.<sup>3</sup>

With that said, that's all we'll have to say about the relative value of Christianity for now, since we have far more important, far more interesting truths to consider.

Perhaps most importantly, I shall utter perhaps the most extraordinary conjecture this discourse had to offer:

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1 SOWM 2008, p 32.

2 Haywood 1995, p 134.

3 Wessén 1995, *Laxness: The Nobel Prize in Literature Presentation Speech*.

our theory of value based upon relative insularity *quantifies* a mechanism which, in the so-called field of evolutionary biology, has, to date, been accepted as undetectable and thus unquantifiable: the *mechanism* for evolution.<sup>1</sup> This mechanism, I submit, is relative insularity itself. And, once this is understood, the razor-sharp, double-edged sword of island evolution becomes especially clear. Islands (i.e. relative insularity) present a double-edged, evolutionary filter (related, I submit, to the cautionary political rhetoric: *The slippery slope of isolationism*) which can act as an *fitness factory*, as it has relatively effectively done throughout the Nordic Nations, and it can alternatively act as a *Dodo factory*, as it did on Mauritius,<sup>2</sup> Funk Island (see cover page, footnote 2), Easter Island, Nauru, and as it may be presently acting – as my findings may suggest – on PEI.

Although Hawaii is often – and for good reasons – regarded as the finest evolutionary fitness factory on Earth for *non-human* species (far better than the Galapagos, largely due to its great distance from the North American continent). Iceland may present the ideal model of an island fitness factory, and this is due almost exclusively to the fact that in “the days of Harald Fine-Hair, the son of Hálfdan the Black,”<sup>3</sup> the Norwegian Vikings were presented with a considerable evolutionary filter, a gauntlet all by impassable except by the *fittest*: Harald's tyranny and the great expanse of the cold and stormy North Atlantic lay between them and the uninhabited “*Ísland*.”

It is curious to note modern-day Icelanders muse that the Faroese are the descendants of sea-sick Vikings whom proved unable to make the remainder of the long journey to Iceland.

This evolutionary filter has been proven curiously illusive to detect, and more often than not, has proven to be completely misunderstood. Consider this passage from *The Penguin Historical Atlas of the Vikings*:<sup>4</sup>

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- 1 Indeed, without isolation new species might never evolve anywhere. If a plant or animal species formed one large interbreeding population without distinctive ecological pockets, changes would likely be wiped out and little progress toward new adaptations could be made (Carlquist 1974, p1).
  - 2 In the year 1598 AD, Portuguese sailors landing on the shores of the island of Mauritius discovered a previously unknown species of bird, the Dodo. Having been isolated by its island location from contact with humanity, the dodo greeted the new visitors with a child-like innocence. The sailors.... dubbed the bird "dodo" (meaning... a simpleton in the Portuguese tongue) (Reilly 1999).
  - 3 Magnússon 1980, p 60.
  - 4 Haywood 1995, *Foreword*.



Recent years have seen great changes in our historical understanding of the Vikings.<sup>1</sup> The traditional image of the Vikings as nothing more than axe-yielding pirates bent on rape and pillage or conquest has been balanced by a new appreciation of peaceful Viking enterprise in the fields of trade, crafts, exploration and settlement.... Some may feel that my approach has over-emphasized the Vikings' warlike activities at the expense of their more constructive enterprises. This... reflects my own unease at the extent to which the importance of violence in the Viking Age has been played down in many recent studies of the period. The Vikings could be a pretty rough crew when it suited them, and it suited many of them very often in the period c. 800-1100.

The misunderstanding this passage represents may be contributed to the general inability to behold and maintain an evolutionary world-view when it comes to its application to the human species. The problem, quite likely inadvertent, is the implicit a priori *interpretation* of what it *means* to be 'warlike' in terms of the murky waters of *social norms*.<sup>2</sup>

I will offer a brief evolutionary interpretation the pre-Icelandic Viking period Haywood deemed “warlike” above: Once upon a time, in the great struggle for life, a pack of hungry, land-less, *independent*, and often genetically related mammals, went foraging for food. On these missions, they engaged in highly rationalized problem solving endeavours, *learned*,<sup>3</sup> and recorded<sup>4</sup> these trials and errors which *served and continue to serve as a conduit for highly*

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1 The term “Viking” has come to be applied to all Scandinavians of the period, but in the Viking age itself the term *vikingr* applied only to someone who went *i viking*, that is plundering (Haywood 1995, p 8).

2 See ABBREVIATIONS & DEFINITIONS: *Social Norms*

3 See ABBREVIATIONS & DEFINITIONS: *Learning*

4 (a) Then Bjarni said that *the people who were to go should be chosen by lot, and not by rank*.

But everyone tried to get into the boat. The boat, however, would not hold them all and so they agreed to this suggestion... When the lots were drawn it so happened that Bjarni himself, along with nearly half the crew, drew a place, and these all left the ship for the boat.

When they were in the boat one young Icelander who had been Bjarni's companion said, 'Are you going to leave me here, Bjarni?'

'This is how it has to be,' replied Bjarni.

The Icelander said, 'But that is not what you promised when I left my father's farm in Iceland to go with you.'

'I see no other way,' said Bjarni. 'What do you suggest?'

'I suggest we change places; you come up here and I shall go down there.'

'So be it,' said Bjarni. 'I can see that you would spare no effort to live, and are afraid to die.'

So they changed places. The Icelander stepped into the boat and Bjarni went back on board the ship; and it is said that Bjarni and all those who were on the ship with him perished [*italics mine*, Magnússon c. 1000 A.D.a, pp 103-104].

(b) A great swarm of skin-boats was then heading towards them down the fjord.

Thorvald said, 'We shall set up breastworks on the gunwales and defend ourselves as best we can, but fight back as little as possible.'

They did this. The Skraelings [The term Skraeling was used in early Icelandic sources to designate the inhabitants of Greenland and North America. The Skraelings of Vinland have been tentatively identified with the Micmac or extinct Beothuk Native American tribes. The derivation of the word is uncertain, but it has contemptuous associations--something like 'wretches'.] shot at them for a while, and then turned and fled as fast as they could.

Thorvald asked his men if any of them were wounded; they all replied that they were unhurt.

'I have a wound in the armpit,' said Thorvald. "An arrow flew up between the gunwale and my shield, under my arm--here it is. This

rationalized social learning and evolution.<sup>1</sup> As Fehr & Gächter noted in *Fairness and Retaliation: The Economics of Reciprocity*:

The Edda, a 13<sup>th</sup> century collection of Norse epic verses, gives a succinct description of reciprocity: “A man ought to be a friend to his fiend and repay gift with gift. People should meet smiles with smiles and lies with treachery.” There is considerable evidence that a substantial fraction of people behave according to this dictum.<sup>2</sup>

And how does the wisdom<sup>3</sup> of the *Edda* compare to the Christian dictum: *to turn your other cheek?*<sup>4</sup>

Over time, a *Viking Theory of Value* rooted in the *Struggle for Life* (as opposed to Christian values, Nationalistic values, Academic values, Corporate values, etc.) evolved which encouraged literacy for all and fostered independent-minded, rational individuals.

On many foraging quests, these explorers encountered confused, dependent people who, through *institutionalized irrationality*, were less able to defend their food and unable understand the world in which they lived.<sup>5</sup>

They simply could not fathom a *human being* (note the disconnect from the animal kingdom) *evil* enough to take a

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will lead to my death.'

'I advise you now to go back as soon as you can. But first I want you to take me to the headland I thought so suitable for a home. I seem to have hit on the truth when I said that I would settle there for a while. Bury me there and put crosses at my head and feet, and let the place be called Krossanes for ever afterwards' (Magnússon c. 1000 A.D.b, pp 60-61).

(c) *He made an agreement with his crew that everyone should share equally in whatever profits the expedition might yield...*

They put to sea and arrived safe and sound at Leif's Houses and carried their hammocks ashore. Soon they had plenty of good supplies, for a fine big rorqual was driven ashore; they went down and cut it up, and so there was no shortage of food....

The livestock were put out to grass.... *They made use of all the natural resources of the country that were available, grapes and game of all kinds and other produce* [all italics mine, Magnússon c. 1000 A.D.b, p 65].

1 (a) I know many examples of success or failure of island life all over the world. Each time the “success story” involves educated populations, while the “failure story” involves the uneducated, illiterate islanders. The basic requirement of island life is a consciousness of group identity, history, and destiny. Group consciousness is the key either to destruction or to liberation (Doumenge 1988, p 342).

(b) Iceland boasts the world's oldest functioning legislative assembly, the Althing, established in 930. Independent for over 300 years, Iceland was subsequently ruled by Norway and Denmark. Fallout from the Askja volcano of 1875 devastated the Icelandic economy and caused widespread famine. Over the next quarter century, 20% of the island's population emigrated, mostly to Canada and the US. Limited home rule from Denmark was granted in 1874 and complete independence attained in 1944. *Literacy, longevity, income, and social cohesion are first-rate by world standards* [italics mine, *CIA World Factbook*, updated 1 November 2007].

(c) Also see, for example, Magnússon & Pálsson, c. 1000 A.D.a, c. 1000A.D.b.

2 2000, p 159.

3 In evolutionary game theory, this survival strategy is referred to as “tit-for-tat.”

4 In evolutionary game theory, this survival strategy is referred to as “always cooperate.”

5 History shows that our theories have been wrong more often than right, resulting in the demise of whole civilizations when we have misinterpreted what is happening to us....

It would be comforting to believe that humans have been prescient enough to understand what is happening to themselves and act accordingly. But... the way the mind understands the external environment—the beliefs humans construct to explain the external world are frequently incorrect, particularly if the changes are creating really novel situations. And clearly, humans have evolved environments radically different from anything that existed before (North 2007).

gazelle from God (or a gold chalice from an unlocked church). *Rational* explanations for these *devilish* deeds were simply *outside* the scope of their religious-based value system, and thus, they were not able to comprehend what was happening in the world around them.

Yes, the Vikings did eventually accept Christianity, but they do not appear orthodox in this acceptance; it seems they generally heeded Shaw's advice: "Do not give your children moral and religious instruction unless you are quite sure they will not take it too seriously."<sup>1</sup> Helgi the Lean claimed to be a Christian, "but invoked Thor in matters of seafaring and dire necessity."<sup>2</sup> In 1946, Halldór Laxness summed up Icelandic rationalism, healthy scepticism, independence, and general position on Christianity in *Independent People*, which seems current yet today:

You should beware of believing things you see in books. I never regard books as the truth, and least of all the Bible, because there's no check on what they can write in them. They can spin lies as big as they like, and you never know, if you haven't been on the spot....

"The story can say what it likes for me," said Bjartur sceptically, "but what I'd like to know is this: Who saw Jesus rise on a Sunday?" (Laxness 1946, p 64).

Again, there is much more light to shed upon this formidable problem, but, for my mother's sake, we'll save that sermon for another day.

Although the theory of value and solution to *The Problem of Sustainable Economic Development* which I have endeavoured to present herewith pertains to all classes of assets, and any and all biogeographical jurisdictions, I hope you may discover my solution addresses the false and sandy economic assumptions which prove especially vexing to island inhabitants. But if this long letter accomplishes nothing else, I hope it has at least irrefutably demonstrated that *we are all islanders, and all inextricably intertwined and inextricably engaged in a non-cooperative game.*

Finally, on one hand I would like to thank Godfrey Baldacchino and Barry Bartmann for their excellent insights, and on the other note that I have gladly undertaken this field expedition to Ålander as an independent man, and, despite the fact that I have completed graduate coursework in Island Studies at The University of Prince Edward Island and conducted minor research for The Institute of Island Studies and the province of PEI, I am not affiliated

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1 1903, ln 42.

2 Haywood 1995, p 33.

with this university, institute, province, or any other individuals in any way; my views are quite my own. In fact, I should disclose that my views, positions, and opinions quite likely *antithetical* and wholly unsupported by those most widely held at The University of Prince Edward Island, The Institute of Island Studies, and the province of PEI, and will illustrate this disparity by closing with the following disclosure: a note from one of my very few fans, sent, appropriately enough, following my first discourse on the value of relative insularity on the island of Mustique:

Subject: Your seminar  
Date: Fri, 25 Apr 2008 15:13:21 -0300  
From: [personal correspondence]  
To: mfunk@upei.ca

Dear Matt,

I received a disturbing e-mail from [one of your good friends] in which he said that you had felt under attack for the whole of the seminar and largely from a left-wing ideological cabal among the students. I am truly sorry that you left feeling... disheartened. You are too gifted a student, Matt, to be thrown off course in any way. And it is so undeserving. You have a remarkable thirst for learning, a rare intellectual craving, and, above all the courage to navigate difficult and uncharted waters. Your intellectual energy is apparent to all and, I would say, an inspiring example to all. I replied to [your friend ] that I was not aware of how pervasive this ideological left-wing view is in the programme, but I have been aware of it from time to time on particular issues such as Cuba. I regard ideology as the enemy of critical thinking. It is usually self-righteous and conspiratorial. Because it is seamless in its connections to all questions, it is thoroughly predictable. And [your colleague] is right when he complains that it is truly unsatisfying to attempt a genuine exchange with someone who is so bound by a formula. I thought your exploration of insularity was thoughtful, innovative and challenging.... I would be truly sorry if you and [your friend] were to avoid these seminars in the future because they should be one of the more exciting aspects of a graduate programme. But, above all, you should not let yourself be wounded in this way. The programme owes a great debt to your contribution. You bring energy, deep reflection and, above all, insight to every class. And everyone in that room should be grateful... It was a very lively exchange. Although I am sure that you were frustrated that it seemed to go all over the map and often far from your paper which so many had not even read. There may be a case for having a moderator to ensure that the discussion stays on course. In any case, Matt, you have a truly promising future ahead of you, including success at the Ph.D. level. Of that, I could not be more confident.<sup>1</sup>

So, rest assured that you will not be alone if you find that you have more criticisms than praise to offer this solo circumnavigator. I will be honoured to hear any and all criticisms, and I hope that you will find some of what I have presented *valuable*. And, afterall, as F.A. von Hayek declared at the end of the finest *Sveriges Riksbank Prize*

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1 Personal Correspondence 2008.

Banquet speech of all time, quoting the infinite wisdom of Alfred Marshall:<sup>1</sup> "Students of social science, must fear popular approval: Evil is with them when all men speak well of them".

Again, I thank you for this great honour and privilege.

May a whole whale wash up upon your shore!

Matt Funk

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<sup>1</sup> In the *Principles*, Marshall confined his use of diagrams and other mathematical notations to footnotes and appendixes so as not to allow his mathematics to detract from his economics. He was interested above all in plain communication—with businessmen as well as with students. Moreover, he was acutely aware that over reliance on mathematics “might lead us astray in pursuit of intellectual toys, imaginary problems not conforming to the conditions of real life: and, further, might distort our sense of proportion by causing us to neglect factors that could not easily be worked up in the mathematic machine” [Pigou, *Memorials*, p. 84 as cited in Ekelund & Hebert 1997, p 341].

## APPENDIX I:

# A UNIFIED THEORY OF VALUE FOR THE BIOLOGICAL AND SOCIAL SCIENCES<sup>1</sup> & SOLUTION TO THE PROBLEM OF SUSTAINABLE ECONOMIC DEVELOPMENT

We give two independent derivations of our solution of the two-person...game. The [first] approach is by the axiomatic method. *One states as axioms several properties that it would seem natural for the solution to have and then one discovers that the axioms actually determine the solution uniquely. The two approaches to the problem, via the negotiation model or via the axioms, are complementary; each helps to justify and clarify the other.*<sup>2</sup>

### AXIOM I      **The Ground Zero Premise**

*The Problem of the Struggle for Life*

Survival and reproduction is the basic, continuing, inescapable problem for all living organisms; life is at bottom a survival enterprise. It follows that survival is the... “problem” for human societies as well; it is a prerequisite for any other, more exalted objectives. Although the term “adaptation” is also familiar to social scientists, until recently it has been used only selectively, and often very imprecisely....Our economic and social life (and the motivations behind our revealed preferences and subjective utility assessments), not to mention the actions of modern governments... [is] either directly or indirectly related to the meeting of our basic survival needs.<sup>3</sup>

### AXIOM II      **The R-3<sup>4</sup> Premise**

*The Problem of the Resource Replenishing Rate*

Global natural Resource consumption is approximately three times (3x) the earthly replenishing rate. Though this problem may be soluble on local, municipal, regional, and even on national levels, in light of *The Tragedy of the Commons*, it is insoluble at the global level.

### AXIOM III      **The Ecological Uncertainty Premise**

Axiom II poses a threat to Axiom I.

### AXIOM IV      **The Political Uncertainty Premise**

*The Problem of Warfighting:*

(i) (1) the system is anarchic, (2) all great powers have some offensive military capability, (3) states can never be certain about other states' intentions, (4) states seek to survive, and (5) great powers are rational actors or strategic calculators.<sup>5</sup>  
(ii) Extinction follows chiefly from the competition of tribe with tribe, and race with race. Various checks are always in action, ...which serve to keep down the numbers of each...tribe, such as...famines,...wars, accidents, sickness,...infanticide, and, perhaps, lessened fertility from less nutritious food, and many hardships. If from any cause any one of these checks is lessened, even in a slight degree, the tribe thus favoured will tend to increase; and when one of two

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1 These 7 Axioms rest upon the fundamental physical laws of science, and, thus, adheres to: (i) *Fluid Mechanics* (Archimedes' Principle), (ii) *Force, Mass, and Inertia* (Kepler's Three Laws of Planetary Motion, Newton's Three Laws of Motion, Newton's Law of Universal Gravitation), (iii) *Heat, Energy, and Temperature* (Newton's Law of Cooling, Boyle's Law, Law of Conservation of Energy, Joule's First and Second Law, The Four Laws of Thermodynamics), and (iv) *Quantum Mechanics* (Heisenberg's Uncertainty Principle). Furthermore, we hereby submit our unified theory of the biological and social sciences maps the range of scientific knowledge, namely (1) the lower limit of what *must* be known, and (2) the upper limit of what *may* be known.

2 Italics mine, Nash 1953, p 129.

3 Corning 2000, abstract.

4 Resource Replenishing Rate.

5 Mearsheimer, p 112, 2006c.

adjoining tribes becomes more numerous and powerful than the other, the contest is soon settled by war.<sup>1</sup>

## AXIOM V The Planetary Uncertainty Premise

### (i) *The Problem of Supernovas:*

In light of Axiom I, an alternative inhabitable planet must be discovered, and immigration must occur within an unknowable time-frame, ostensibly as soon next year, but no later 99,000 years from present (see vi, below).

### (ii) *The Problem of Ohmic Decay:*

The mechanism by which the Earth and other planets maintain their magnetic fields against ohmic decay is among the longest standing problems in planetary science. Although it is widely acknowledged that these fields are maintained by dynamo action, the mechanism by which the dynamo operates is in large part not understood. Numerical simulations of the dynamo process in the Earth's core have produced magnetic fields that resemble the Earth's field, but it is unclear whether these models accurately represent the extremely low values of viscosity believed to be appropriate to the core.<sup>2</sup>

### (iii) *The Problem of Meteorites:*

It is widely believed that meteorites originate in the asteroid belt, but the precise dynamical mechanism whereby material is transported to Earth has eluded discovery. The observational data for the ordinary chondrites, the most common meteorites, impose severe constraints on any proposed mechanism. The ordinary chondrites are not strongly shocked, their cosmic ray exposure ages are typically <20 Myr, their radiants are concentrated near the antapex of Earth's motion and they show a pronounced 'afternoon excess' (for every meteorite which falls in the morning two fall in the afternoon). Wetherill concluded that these data could only be explained by an "unobserved source" of material... His subsequent, more sophisticated investigations have not changed this basic conclusion. Recently I have shown that there is a large chaotic zone in the phase space near the 3/1 mean motion commensurability with Jupiter and that the chaotic trajectories within this zone have particularly large variations in orbital eccentricity. Since asteroidal debris is quite easily injected into this chaotic zone, it could provide Wetherill's 'unobserved source' if chaotic trajectories which begin at asteroidal eccentricities ( $e < 0.2$ ) reach such large eccentricities that Earth's orbit is crossed ( $e > 0.57$ )... At least some of these chaotic trajectories do have the properties required to transport meteoritic material from the asteroid belt to Earth. Combined with the Monte Carlo calculations which show that the resulting meteorites are consistent with all the observational constraints, *the case for this chaotic route to Earth is fairly strong* [italics mine].<sup>3</sup>

### (iv) *The Problem of Chaotic Behaviour:*

There are several physical situations in the solar system where chaotic behavior plays an important role. Saturn's satellite Hyperion is currently tumbling chaotically. Many of the other irregularly shaped satellites in the solar system had chaotic rotations in the past. There are also examples of chaotic orbital evolution. Meteorites are most probably transported to Earth from the asteroid belt by way of a chaotic zone. Chaotic behavior also seems to be an essential ingredient in the explanation of certain non-uniformities in the distribution of asteroids. The long-term motion of Pluto is suspiciously complicated.<sup>4</sup>

### (v) *The Problem of Super-Eruptions:*

In the past 2 Myr, there have been, on average, two super-eruptions every hundred millennia, the last of which shattered the crust of New Zealand's north island 26,500 years ago. To date, no mechanisms have been discovered for predicting these events; thus an eruption of this magnitude (VE8)<sup>5</sup> is possible within this decade and likely within 100,000 years. Post-eruption human survival is unlikely; even smaller eruptions (VE4, VE5, VE6) present significant problems.

### (vi) *The Problem of Solar Flux:*

There has been life on Earth for at least 3,500 Myr but the assumption that a comparable future lies ahead may not be justified. Main sequence stars appear to increase their burning rate as they age. Thus the Sun, if a typical star, can be predicted to have increased its output by 30% since the Earth's origin 4,500 Myr ago. The maintenance of an equable climate since life began probably required some means of planetary thermo-stasis. The Gaia hypothesis proposed by Lovelock and Margulis included an unspecified biological means for climate control. Walker... suggests an abiological automatic thermostasis in which the atmospheric abundance of CO<sub>2</sub>, a greenhouse gas, adjusts to resist the warming tendency of the increased solar flux. It is clear that whatever the mechanism, atmospheric CO<sub>2</sub> is now close to its lower

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1 Darwin 1888, p 912.

2 Kuang & Bloxham 1997, abstract.

3 Wisdom 1985, abstract.

4 Wisdom 1987, abstract.

5 Self 1982

limit of partial pressure, so the biosphere may soon, in geological terms, be exposed without protection to the predicted progressive increase of solar luminosity.<sup>1</sup>

## AXIOM VI The Deductive Premise

*The Problem of Induction*<sup>2</sup>

Our foregoing method of reasoning will easily convince us, that *there can be no demonstrative arguments to prove, that those instances, of which we have had no experience, resemble those, of which we have had experience.*<sup>3</sup>

## AXIOM VII The Insularity Premise

*The Problem of Value*<sup>4</sup>

The search for an economic theory of value may have begun with Aristotle. For the next half-century, however, very little progress was made,<sup>5</sup> and the evolutionary stable theory tabled in 1776 by Smith<sup>6</sup> was fully adopted by the classical school and generally accepted for nearly a century. The German school grew critical, however, and this Germanic scepticism gave birth to the Austrian School and their quest for a new *Theory of Value*, which began with a very independent professor of political economy at the University of Vienna, the Austrian School's founding father, Carl Menger (1840–1921).<sup>7</sup> In his 1871 *Grundsätze der Volkswirtschaftslehre (Principles of Economics)*, Menger outlines his groundbreaking theory.<sup>8</sup>

Perhaps the most convoluted, self-refuting theory may have been tabled by Walras in 1886.<sup>9</sup> Walras, however, was certainly not alone in his approach. Indeed, all known (to this fairly well-read author, that is) attempted solutions since Menger have, essentially, followed Wieser's method,<sup>10</sup> and, despite the extraordinary efforts from Aristotle to Smith to Menger to Weiser, economics has remained without a theory of value. Note, however, the development of our theory has *not* followed the methodological approach consistent with previous attempts. Based upon our understanding that insularity is the key to evolutionary fitness (including, for example, *economic* evolutionary fitness) and thus life on earth,<sup>11</sup> our theory of value is constructed by demonstrating that *value (V)* is a *derivative function* of relative insularity; we are able

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1 All italics mine, Lovelock & Whitfield 1982, abstract.

2 See ABBREVIATIONS & DEFINITIONS: *The Problem of Induction*.

3 Italics mine, Hume 1739, Book I, Vol I, p 137.

4 See ABBREVIATIONS & DEFINITIONS: *Theory of Value*.

5 Ibid.

6 (a) Gould 2002.

(b) It has been said that one finds in Adam Smith nearly all the explanations of value which have ever been attempted. What is certain is that, in his explanation, Adam Smith has put together two views that contradict each other (Wieser 1893, p xxvii).

7 As I feel a bit of reverence building up, in the spirit of disclosure, I will take a moment to offer full transparency: since I feel a debt of inestimable gratitude for the Austrian School (Hayek and Popper in particular), I may be prone to being overly sympathetic to their positions (I will, for example, mostly ignore Walras and Jevons, whom seem to me as foolish as Irving Fisher (see Funk 2007b).

8 (a) It is in Austria, in the lineal succession to Menger, that the development of the new value theory is to be sought (Wieser 1893, p xxxiv).

(b) In Chapter III, Menger (1871) presents his groundbreaking *Theory of Value*; the essence, clarity, and promethean insight of this chapter may best sampled in Section E: *The value of the services of land, capital, and labour, in particular*.

9 That of Walras, though admirable of its kind, suffers, to my mind, from the preponderance of the mathematical element. The laws which govern amounts of the value undoubtedly allow of a mathematical expression ; nay, the more complicated of these can be expressed exactly only by means of mathematics ; and here certainly mathematics has a great task to fulfil. But in the value theory we have to do with something more than the expression of the laws of amounts. The obscure conception of value is to be made clear ; *all its manifold forms are to be described* [italics mine] ; the service of value in economic life is to be analysed ; the connection of value with so many other economic phenomena is to be shown (Wieser 1893, p xxxiii).

10 The economist who undertakes to explain value has to explain the procedure of those who value. He describes in plain language the meaning of transactions carried on, times without number, by all of us. He does, on a large scale and with a difficult subject, the same thing as one who accurately describes some trade or some mechanical operation, which every one can do, but which it is not easy, without the assistance of concrete instances, to present and follow up in all its complexity of conditions (1893, p 5).

11 Carlquist 1974, p 1.



to quantify value far more accurately *and* far more easily by quantifying it *indirectly*.<sup>1</sup> Aside from the originality of value based upon insular qualities, the *derivative nature* of this theory is what lends this insight elegance, simplicity, and power:  $V=f'(I_R)$ ! The utter simplicity and descriptive power of this theory, what sets it apart from every known previous attempt, is this is the first which expressly does *not* attempt to “describe all manifold forms,” and “the myriad connections of economic phenomena;” rather, this theory describes the *environment*<sup>2</sup> in which economic value is created (from which it is *derived*)! In other words, the relative insularity of a biogeographic region itself is *not* what makes it valuable, the value is *derived* as a direct by-product of this insularity. For example, backing out to the most macro-view, a quick look at the *relative insularity* of the Earth reveals that the earth is *more valuable, relatively speaking*, than the other planets in our solar system due to the value of the relatively high level of atmospheric insularity which enables the Earth to produce both biologic *and* economic value: *Life!*

Moreover, although our quest had commenced as a search for an *economic* theory of value, in the end, our solution produced a *universal* (economic and biologic) *Theory of Value*, which presents a solution to what arguably represents the most fundamental problem in any so-called “field” of science, since relative insularity is as valuable to whales, dragonflies, and unicellular organisms as it is to man. Although this solution was inadvertent, it is a logical outcome, since it is well understood that a useful, truthful economic theory of value requires a biogeographical and political foundation which acknowledged *The Problem of Induction*, including both political and extraterrestrial uncertainties. Our theory was constructed by simply observing nature, by simply observing the universal revealed preference for relative insularity, and thus, moreover, discovering that *value* (V) is a derivative function of *relative insularity* ( $I_R$ ):  $V=f'(I_R)$ . Our axioms also reveal that, contrary to the central thesis of so-called “ecological economics,” the Earth is not in fact a closed-system, but rather merely *semi-closed* and thus only relatively insular. Comprehending these biological and planetary realities is the cornerstone to the comprehension of our unified theory. Greater clarity may be derived with the following game theoretical application: Applying our *Theory of Value* within requisite biogeographical & political context of the necessarily non-cooperative game (in which all the world is a stage; note the great Nash insight pasted across the cover-page) reveals divergent, optimizing rational strategies for *continental* (GEMS) and *insular* (RIS) economic development. Our theory reveals pure GEMS and RIS strategies are antithetical, yet discover, in light of *The Problem of Induction*, these naturally opposing strategies represent the most tenable, rational solution possible. How is it possible that two players may arrive at two *different*, antithetical optimal strategies when utilizing the same theory of value? Although there is ultimately only one sphere of insularity, it must be defended on two *inherently uncertain* levels: (1) insularity pertaining to the biosphere (i.e. Ecology: Axioms I-III, the “whole world” according to the principles of “ecological economics”), and (2) insularity pertaining to the semi-closed nature of the biosphere, including planetary and extra-planetary forces and uncertainties (i.e. meteorites, volcanoes, chaotic gravitational forces, supernovas, etc.: Axiom V), and geopolitical uncertainty (i.e. War: Axiom IV). Generally speaking, pure RIS strategy protects relative insularity on the first level, while GEMS pure strategy protects relative insularity on the second level. Moreover, our theory of value is as applicable and powerful at the local and individual levels as it is at the national/global level, including its use as a powerful analytical tool applicable to common problems, such as: (1) where to live (addressing both biogeographical and geopolitical insularity), (2) what to eat, (3) how to vote, (4) where to vacation, (5) what type of vehicle to drive, (6) what types of investments to make, (7) what water to drink, and, most generally, (8) understanding how relative insularity frames strategic decision-making under uncertainty.<sup>3</sup> Furthermore, our *Theory of Value* demonstrates systemic RIS strategic errors. These errors reflect the general misunderstanding of the derivative nature of economics, time-inconsistent preferences, hyperbolic discounting,<sup>4</sup> and a fundamental democratic constitutional maladaptation, *The Tragedy of the Commons*.

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1  $I_R$  is formulated with: *Land Area* ( $km^2$ ), *Elevation* (m), *Distance from nearest Continent* (km), *Distance from nearest Neighbour* (km), *Nearest Neighbour Land Area* ( $km^2$ ), *Renewable Water Resources* ( $m^3/person/year$ ), *Population Density* ( $p/km^2$ ), *Exclusive Economic Zone Area* ( $km^2$ ), *International Airports* (n), *Deep Water Harbours* (n), *Marine Links*, (n) *Land Links* (n), *Forests* ( $\% km^2$ ), *Commercial Agriculture* ( $\% km^2$ ), *Organic Agriculture* ( $\% km^2$ ), *Subsistence Agriculture* ( $\% km^2$ ), *Nature Preserve* ( $\% km^2$ ), *Tourist Visits* ( $p/yr$ ), *Irrigation* ( $m^3/person/year$  &  $\% km^2$ ), *Industrial Water Consumption* ( $m^3/person/year$ ), *Organic Water Pollutants* (grammes/p/day), *Food Imports* ( $\%$ ), *Sovereign Status*, *Constitutional Balance*, *Cultural Homogeneity*, and *Military Power*. We calibrate our formulae by adjusting relative input weighting in accordance a positive, linear biogeographical correlation between  $I_R$  and the average human life expectancy for the corresponding politico-biogeographic area.

2 One of the great discoveries of game theory came in the early seventies, when the biologists John Maynard Smith and George Price realized that strategic equilibrium in games and population equilibrium in the living world are defined by the same equations. Evolution be it genetic or memetic – leads to strategic equilibrium (Aumann 2005, p 352).

3 See ABBREVIATIONS & DEFINITIONS: *The Problem of Induction* (exempli gratia: k)

4 See ABBREVIATIONS & DEFINITIONS: *Hyperbolic Discounting*

## APPENDIX II: AN OPEN LETTER TO PARTHA DASGUPTA

Sir Partha Dasgupta, Fellow, St. John's College  
University of Cambridge, Faculty of Economics  
Sidgwick Avenue  
Cambridge, England

1 May 2008

### RE: A Solution to *The Problem of Sustainable Economic Development*

Dear Sir:

I am writing to inform you that you have made a great mistake.

Your error came to my attention while reviewing *Nature in Economics*.<sup>1</sup> I emphasize the greatness of this mistake because, upon a broad review of your considerable works,<sup>2</sup> I have discovered that this fundamental error is entrenched in your most fundamental assumptions, and in short, I conjecture you have committed this error for four (possibly five) primary reasons : (1) you do not understand *The Problem of Induction*, (2) you do not understand that economics is a *derivative science* (and *derivative*, in this sense, is not a reference to the well-known financial WMD's,<sup>3</sup> but rather to Bertrand Russell's *Theory of Economic Power*),<sup>4</sup> and moreover (3) you have failed to comprehend,

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1 2007.

2 See SELECTED BIBLIOGRAPHY: Dasgupta.

3 The derivatives genie is now well out of the bottle, and these instruments will almost certainly multiply in variety and number until some event makes their toxicity clear. Knowledge of how dangerous they are has already permeated the electricity and gas businesses, in which the eruption of major troubles caused the use of derivatives to diminish dramatically. Elsewhere, however, the derivatives business continues to expand unchecked. Central banks and governments have so far found no effective way to control, or even monitor, the risks posed by these contracts.

Charlie and I believe Berkshire should be a fortress of financial strength – for the sake of our owners, creditors, policyholders and employees. We try to be alert to any sort of megacatastrophe risk, and that posture may make us unduly apprehensive about the burgeoning quantities of long-term derivatives contracts and the massive amount of uncollateralized receivables that are growing alongside. In our view, however, derivatives are financial weapons of mass destruction, carrying dangers that, while now latent, are potentially lethal [Buffett 2003, p 15. Also see Jon Danielsson's (2000) *The Emperor has no Clothes: Limits to Risk modeling*].

4 (a) *Economic power, unlike military power, is not primary, but derivative. Within one State, it depends on law; in international dealings it is only on minor issues that it depends on law, but when large issues are involved it depends upon war or the threat of war. It has been customary to accept economic power without analysis, and this has led, in modern times, to an undue emphasis upon economics, as opposed to war and propaganda, in the causal interpretation of history.*

*Apart from the economic power of labour, all other economic power, in its ultimate analysis, consists in being able to decide, by the use of armed force if necessary, who shall be allowed to stand upon a given piece of land and to put things into it and take things from it [all italics mine, 1928, p 95].*

(b) *The very nature of economics is rooted in nationalism...It would never have been developed except in the hope of throwing light upon questions of policy, but policy means nothing unless there is authority to carry it out, and authorities are national [italics mine Robinson 1962, p 117].*

(c) *The hidden hand of the market will never work without a hidden fist. McDonald's cannot flourish without McDonnell Douglas... And the hidden fist that keeps the world safe for Silicon Valley's technologies is called the United States Army, Air Force, Navy, and Marine Corps." (Friedman 1999).*

essentially, *the whole economy of nature*;<sup>1</sup> (4) you do not understand that subject matters do not exist,<sup>2</sup> and (5) another possible reason, I suspect, may be related to your personal religious beliefs, but since I do not know you personally, I will leave this point for your consideration. If you are a religious man, however, I recently addressed problem<sup>3</sup> (in conjunction with the non-existence of subject matters in APPENDIX IV: ON THE PROBLEMS OF SUBJECTS & RELIGIONS, and we will, moreover, address this problem's insidious relationship with *The Problem of Sustainable*

(d) Power Projection: The ability of a nation to apply all or some of its elements of national power - political, economic, informational, or military - to rapidly and effectively deploy and sustain forces in and from multiple dispersed locations to respond to crises, to contribute to deterrence, and to enhance regional stability (The United States Department of Defense 2001).

1 See ABBREVIATIONS & DEFINITIONS: *The Struggle for Life*.

2 As a rule, I begin my lectures on Scientific Method by telling my students that scientific method does not exist. I add that I ought to know, having been, for a time at least, the one and only professor of this non-existent subject within the British Commonwealth.

It is in several senses that my subject does not exist, and I shall mention a few of them.

First, my subject does not exist because subject matters in general do not exist. *There are no subject matters; no branches of learning—or, rather, of inquiry: there are only problems, and the urge to solve them.* A science such as botany or chemistry (or say, physical chemistry, or electrochemistry) is, I contend, merely an administrative unit. University administrators have a difficult job anyway, and it is a great convenience to them to work on the assumption that there are some named subjects, with chairs attached to them to be filled by the experts in these subjects. I do not agree: even serious students are misled by the myth of the subject. And I should be reluctant to call anything that misleads a person a convenience to that person.

So much about the non-existence of subjects in general. But Scientific Method holds a somewhat peculiar position in being even less existent than some other non-existent subjects.

What I mean is this. The founders of the subject, Plato, Aristotle, Bacon and Descartes, as well as most of their successors, for example John Stuart Mill, believed that there existed a method of finding scientific truth. In a later and slightly more sceptical period there were methodologists who believed that there existed a method, if not of finding a true theory, then at least of ascertaining whether or not some given hypothesis was true; or (even more sceptical) whether some given hypothesis was at least 'probable' to some ascertainable degree.

I assert that no scientific method exists in any of these three senses. To put it in a more direct way:

(1) There is no method of discovering a scientific theory.

(2) There is no method of ascertaining the truth of a scientific hypothesis, i.e., no method of verification.

(3) There is no method of ascertaining whether a hypothesis is 'probable', or probably true [Popper 1956, pp 5-6].

3 (a) The word God is for me nothing more than the expression and product of human weaknesses, the Bible a collection of honourable, but still primitive legends which are nevertheless pretty childish. No interpretation no matter how subtle can (for me) change this. These subtilised interpretations are highly manifold according to their nature and have almost nothing to do with the original text. For me the Jewish religion like all other religions is an incarnation of the most childish superstitions. And the Jewish people to whom I gladly belong and with whose mentality I have a deep affinity have no different quality for me than all other people. As far as my experience goes, they are also no better than other human groups, although they are protected from the worst cancers by a lack of power. Otherwise I cannot see anything 'chosen' about them.

In general I find it painful that you claim a privileged position and try to defend it by two walls of pride, an external one as a man and an internal one as a Jew. As a man you claim, so to speak, a dispensation from causality otherwise accepted, as a Jew the privilege of monotheism. But a limited causality is no longer a causality at all, as our wonderful Spinoza recognized with all incision, probably as the first one. And the animistic interpretations of the religions of nature are in principle not annulled by monopolisation. With such walls we can only attain a certain self-deception, but our moral efforts are not furthered by them. On the contrary (Einstein 1954).

(b) I am aware that the assumed instinctive belief in God has been used by many persons as an argument for His existence. But this is a rash argument, as we should thus be compelled to believe in the existence of many cruel and malignant spirits, only a little more powerful than man; for the belief in them is far more general than in a beneficent Deity. The idea of a universal and beneficent Creator does not seem to arise in the mind of man, until he has been elevated by long-continued culture (Darwin 1883, p 1242).

(c) Beware of the man whose god is in the skies (Shaw 1903, ln 83).

(d) Also see Hitchens 2007 ; Weale 2007 ; Dawkins 2006 ; Darwin 1883 ; Russell 1931 ; Hume 1777a, 1777b, & 1779.

Before detailing my critique of *Nature in Economics*, I will note that, despite the impression you may have at this early stage, I admire your endeavours and I am sympathetic to your noble quest for a solution to the problem of global resource consumption, as I have also been struggling with this problem for quite some time, perhaps even longer than I am able to recall.<sup>1</sup>

A good friend, fellow sailor, and wise mentor once taught me that you can learn most of what there is to know about someone by sailing with them for a while; I've also come to believe that you can learn most of what there is to know about the Earth by sailing *alone* with her for a while, and I believe a brief elaboration upon this belief may prove illuminating: on April 24<sup>th</sup>, 1895, at the age of 51, Joshua Slocum<sup>2</sup> sailed away from Boston on his 35 ft sloop, *Spray*. Three years later, on June 27<sup>th</sup>, 1898 he returned, completing the first solo circumnavigation of the Earth. Slocum's independence, resourcefulness,<sup>3</sup> self-sufficiency,<sup>4</sup> and sage advice,<sup>5</sup> to "know the sea, and know that you

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1 See APPENDIX III: THE SEA I.

2 Captain Joshua Slocum was born in Nova Scotia in 1844. His father was a farmer, but for many generations his had been a seafaring family and, like most small boys along that coast, he spent every minute of his holidays in and out of small boats, though like many other sailors he never learned to swim... He was eight years old when his family moved to Briar's Island and he left school and was put to work on the farm. At the age of twelve he was caught making a ship model in the cellar where he should have been grading potatoes, was given a beating, saw his model smashed and ran away from home. For the next few years he earned a living for himself, as a cook, ship's boy and what not, among the fishermen on the Bay of Fundy. At the age of sixteen he and a friend sailed before the mast in a full-rigged ship from St. John's [sic.], New Brunswick, to Dublin [Ransom's 1947 *Introduction to Slocum 1900*, p 22].

3 Although the \$553.62 spent for materials seems high in comparison with Thoreau's \$28.12, *Spray* had to endure storms unknown on Walden Pond. Moreover, Thoreau borrowed an axe near the end of March 1845 and began to occupy his house on the Fourth of July, while Slocum spent thirteen solid months rebuilding the old wreck of a sloop... Both constructions served equally well in carrying their amateur builders out of the world; both led to books that have long outlived the timbers (Whitehill 1957, p 541).

4 The day I appeared there was a buzz at the gossip exchange: at last someone had come and was actually at work on the old *Spray*. "Breaking her up, I s'pose?" "No; going to rebuild her." Great was the amazement. "Will it pay?" was the question which for a year or more I answered by declaring that I would make it pay.

My axe felled a stout oak-tree near by for a keel, and Farmer Howard, for a small sum of money, hauled in this and enough timbers for the frame of the new vessel. I rigged a steam-box and a pot for a boiler. The timbers for ribs, being straight saplings, were dressed and steamed till supple, and then bent over a log, where they were secured till set. Something tangible appeared every day to show for my labour, and the neighbours made the work sociable. It was a great day in the *Spray* shipyard when her new stem was set up and fastened to the new keel... The much-esteemed stem-piece was from the butt of the smartest kind of pasture oak. It afterward split a coral patch in two at the Keeling Islands, and did not receive a blemish. Better timber for a ship than pasture white oak never grew (Slocum 1900 pp 34-35).

5 After nearly sixty years, interest in Captain Joshua Slocum's single-handed voyage around the world grows rather than diminishes. The captain's own narrative, published in 1900 by the Century Company, was kept in print for forty-eight years (and seventeen printings) by them and their successor companies. It was translated into Polish, German, French and Dutch, and has been widely read in England (Whitehill 1957, p 540).

know it,"<sup>1</sup> has offered inspiration to sailors ever since,<sup>2</sup> as another soloist recently reflected:

My interest in sustainability has developed over the years quite naturally through sailing, because when you're at sea you have to manage your resources... You take the minimum you think you can get away with because you want the boat to be as light as possible and you never waste anything, you know where your energy is coming from, you measure it and you measure what you're using, and that's very... different from every day life; you notice the change when you jump off the boat.<sup>3</sup>

Yes indeed, as you noted in your excellent review of Jared Diamond's *Collapse: How Societies Choose to Fail or Survive* (I also found Diamond's effort deficient), "scarcities lead individuals and societies to search for ways out, which often means discovering alternatives;" the uncertainties and scarcities inherent with sailing (being alone with limited resources on a merciless sea,<sup>4</sup> for example) also foster the development of flexible tactics.<sup>5</sup> It is even possible that these two powerful elements (circumnavigation and isolation), may offer something even more substantial; as E. O. Wilson noted, the *Journal of Researches into the Natural History and Geology of the Countries Visited During the Voyage of H.M.S. Beagle Round the World* (a.k.a. *Voyage of the Beagle*)<sup>6</sup>

can be read from several perspectives and interpreted according to taste. One very important but seldom noticed feature is its exemplification of the *Wanderjahre* (years of wandering) in the genesis of the scientific mind. No English term conveys the exact same meaning as the German. It refers originally to the medieval custom of sending young men to other villages or towns to learn a craft and more of the world in a different setting. History has shown that there is no more fruitful way to launch the career of a naturalist than by such an interlude, during which the adventurer travels *alone*, searching, freed from domestic ties, and energized by... visceral ambition...The pages of *Voyage of the Beagle* are the diary of Darwin's *Wanderjahre*. As he proceeds around the world (England-South America-Galapagos-South Pacific-South Africa-South America-England), the young naturalist unconsciously builds the foundation of what was to be his evolutionary view of life.<sup>7</sup>

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1 Ibid, p 18.

2 Whether you call it "communing with nature" or "feeling at one with the world," there are times single-handing can only be described as a spiritual experience -- days when you marvel at the sea and sky and are awed and humbled by the majesty of nature, days when you savour the interaction of the boat with wind and waves and say to yourself "It just doesn't get any better than this." According to an unpublished study by Dewey, Kahn, Yu, and Howe, these moments are covered by the inverse square rule -- the intensity of the experience decreases by the square of the number of people aboard (Guenther 2004).

3 MacArthur 2007.

4 He was an old man who fished alone in a skiff in the Gulf Stream and he had gone eighty-four days now without taking a fish (Hemingway 1952, p 9).

5 Military officers are fond of saying that few plans survive first contact with the enemy, and the same may be said for the plans of the crew of a small vessel encountering heavy weather for the first time. Such plans as have been made have to be flexible. Unexpected events are likely to occur, the weather forecast is often a simplified overview, and people's behaviour may be unpredictable under duress of prolonged exposure to blinding spray, fear, cold temperature, wearying noise and violent motion (Coles 1967, p 155).

6 Darwin 1836.

7 Wilson 2006, pp 18-19.

Wilson's conjecture meshes well with another sailor's experience: Last January, after sailing 57 days alone, averaging over 19 knots for 26,000 non-stop miles on his 97 foot trimaran, *Idec II*, Francis Joyon<sup>1</sup> recalled

there were two very worrying moments... once in the south in the middle of the ice, as the storm started to blow, and in the Doldrums, when I discovered I could lose my mast... *The breaking up of the pack ice and the icebergs floating around at unusual latitudes attracted my attention.*<sup>2</sup>

Revisiting this theme back on shore, Joyon observed that “a boat is like an island, or, indeed, like the planet: you need to protect [it].”<sup>3</sup>

I have spun this nautical yarn because I want to impress upon you that I, like you and many sailors and searchers I admire most, also hold a deep concern for the Earth. But, as a fellow champion of game theory,<sup>4</sup> equally aware of the seemingly distasteful sacrifice implicit<sup>5</sup> in the *rational strategy to all Prisoners' Dilemmas*, I trust that, after reviewing the long argument in this letter, you may be willing to consent that “rational” and “optimal” natural resource consumption levels may be far more difficult to determine than you have presumed. Although it may be true that Joyon's sailboat is a small model of an island, which is, in turn, a small model of the Earth, and although it is indeed true that we do need to *protect* it, since you do not understand that subject matters do not exist, you have failed to consider fundamental principles which belong to the so-called subjects of “astronomy,” “political science,” and “evolutionary biology,” and thus you do not comprehend all of the ways in which it must be protected.

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1 Those who witnessed his crossing of the start line off Ushant [France] on the morning of 23rd November could never have dreamt that they would be witnessing his return just 57 days, 13 hours, 34 minutes and 6 seconds later - bettering Ellen [MacArthur's] time by a solid 14 days ! Joyon, who sees little merit in the complexities of modern gadgetry, proved he could complete his epic voyage with no more power than could be provided by a small wind generator and a couple of solar-panels. He prefers to leave the weight of an engine - and most other go-fast devices ashore so he has more time to get on with the job of sailing the boat. This is ground-breaking stuff that calls into question the very basis of current thinking in this domain.... Bravo Francis! (Irens 2008).

2 Italics mine, Joyon 2008.

3 Gelder 2008, p 1.

4 See ABBREVIATIONS & DEFINITIONS: *Game Theory*.

5 Life's toughest choices are not between GOOD AND BAD, but between BAD AND WORSE. We call these *choices between lesser evils*. We know that whatever we choose, something important will be sacrificed. Whatever we do, someone will get hurt. Worst of all we HAVE to choose. We cannot wait for better information or advice or some new set of circumstances. We have to decide NOW, and we can be sure that there will be a price to pay. If we do not pay it ourselves, someone else will.

These are the kinds of choices we face when dealing with terrorist threats. If we do too little, we will get attacked again. If we do too much, we will harm innocent people. In making these choices, we never have enough information. Some sources exaggerate the threat; others minimize it. Nothing we are told is reliable and nothing we do is ever likely to strike the right balance (Ignatieff 2004, Preface).

I should also note that it is possible that we possess two very different perceptions of “mistakes” and “errors,” since I believe the recognition of errors or mistakes is something to be celebrated, rather than lamented,<sup>1</sup> since they chart courses closer to truths,<sup>2</sup> and although this outlook was popular in Austria at one time,<sup>3</sup> and popular at the London School of Economics at another,<sup>4</sup> it is not an especially fashionable school of thought today. However, a renaissance of sorts may be blossoming in Austria today; consider the current copy on the economics department homepage at the legendary University of Vienna:

Economics came to the University of Vienna in 1763, when Johann Freiherr von Sonnenfels was appointed professor for Cameralwissenschaft in the law faculty by the Empress Maria Theresia. He and his followers were supposed to teach the upper echelons of the future state employees the art of rational administration. That orientation continued for about 100 years.

After 1870 the University of Vienna became one of the centres of the emerging new economic theory.

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- 1 This problem had been seen and solved long before; first, it appears, by Xenophanes, and then by Democritus, and by Socrates... The solution lies in the realization that all of us may and often do err, singly and collectively, but that this very idea of error and human fallibility involves another one—the idea of objective truth: the standard which we may fall short of. Thus the doctrine of fallibility should not be regarded as part of a pessimistic epistemology. This doctrine implies that we may seek for truth, for objective truth, though more often than not we may miss it by a wide margin. And it implies that if we respect truth, we must search for it by persistently searching for our errors: by indefatigable rational criticism, and self-criticism (Popper 1963, p 21).
  - 2 In science, a mistake we make – an error – consists essentially in our regarding as true a theory that is not true... to combat the mistake, the error, means therefore to search for objective truth and to do everything possible to discover and eliminate falsehoods. This is the task of scientific activity. Hence we can say: our aim as scientists is objective truth; more truth, more interesting truth, more intelligible truth. We cannot reasonably aim at certainty. Once we realize that human knowledge is fallible, we realize also that we can *never be completely certain* that we have not made a mistake [italics Popper's 1992 p. 4].
  - 3 (a) Though there is no longer a distinct Austrian School, I believe there is still a distinct Austrian tradition from which we may hope for many further contributions to the future development of economic theory (Hayek).  
(b) Perhaps the most important lesson, which I have learned from Mises, was a lesson located outside economics itself. What Mises taught us in his writings, in his lectures, in his seminars, and in perhaps everything he said, was that economics—yes, and I mean sound economics, Austrian economics—is primordially, crucially important. Economics is not an intellectual game. Economics is deadly serious. The very future of mankind—of civilization—depends, in Mises' view, upon widespread understanding of, and respect for, the principles of economics.  
This is a lesson, which is located almost entirely outside economics proper. But all Mises' work depended ultimately upon this tenet. Almost invariably, a scientist is motivated by values not strictly part of the science itself. The lust for fame, for material rewards—even the pure love of truth—these goals may possibly be fulfilled by scientific success, but are themselves not identified by science as worthwhile goals. What drove Mises, what accounted for his passionate dedication, his ability calmly to ignore the sneers of, and the isolation imposed by, academic contemporaries, was his conviction that the survival of mankind depends on the development and dissemination of Austrian economics....Austrian economics is not simply a matter of intellectual problem solving, like a challenging crossword puzzle, but literally a matter of the life or death of the human race (Kirzner 2006).
  - 4 I liked New Zealand very much, in spite of the hostility shown by some of the University authorities to my work, and I was ready to stay there for good. Early in 1945 I received an invitation from the University of Sydney. There followed some newspaper criticism in Australia about the appointment of a foreigner, and some questions were asked in Parliament. So I cabled my thanks and declined. Shortly afterwards – the war in Europe was in its last stages – I received a cable, signed by Hayek, offering me a readership at the University of London, tenable at the London School of Economics, and thanking me for sending *The Poverty of Economica*, of which he was the acting editor. I felt that Hayek had saved my life once more. From that moment I was impatient to leave New Zealand (Popper 1974, p 1380).

Carl Menger, Friedrich von Wieser, Eugene von Böhm-Bawerk - the founding fathers of the Austrian School - were professors in our department. After World War I the influence of this school in our department declined for various reasons. One was that the intellectual climate in Austrian universities became rather conservative and hostile to liberal ideas, just at the time when a new generation of the Austrian School, namely Schumpeter, Mises, Hayek, Machlup, Morgenstern among others were becoming more liberal in the field of economic policy and hostile to state intervention. The growing anti-Semitism in all spheres of public life also contributed to the waning influence of the Austrian School at the University of Vienna. It increased the difficulties Fritz Machlup and Paul Rosenstein-Rodan faced in their academic careers. It is no wonder that nearly all so-called Austrians emigrated to the United Kingdom and the USA in the 1930s, most of them before the German occupation of Austria in March 1938. For a long period after World War II, the department remained rather closed to modern economics, particularly to its analytical methods, as was true in most other German speaking universities. Interest in modern economic theory began to increase only in the late sixties. Today we are an open, research oriented department in the faculty of Wirtschaftswissenschaften, a unit comprising the departments of economics, business administration, finance and statistics.<sup>1</sup>

How often do you encounter this type of honesty at the institutional (educational) and/or corporate level?

That web-page copy wouldn't pass muster in almost any major marketing department or advertising agency, but we submit it marks exemplary courage, a high capacity for reflection, and, most importantly, a measure for the critical capacity for correction-of-error, and thus ability to derive truths. As Seneca noted long ago, in the so-called time of Christ:

Why does no one admit his failings? Because he's still deep in them. It's the person who's awakened who recounts his dream, and acknowledging one's failings is a sign of health.<sup>2</sup>

More contemporaneously, Sir John Eccles<sup>3</sup> biography for his Nobel Prize in Medicine noted

the New Zealand interlude was... notable because there Eccles met the philosopher, Karl Popper, from whom he learnt the relationship of the scientist to hypotheses; how to be daring in developing hypotheses of the greatest generality, and at the same time how to test them with the utmost rigour with the consequence either of falsification in whole or in part, or at best corroboration; but never confirmation. He feels that this relationship to hypotheses has not only increased his conceptual power, but has also greatly helped emotionally!<sup>4</sup>

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1 Rosner 2008.

2 c. A.D. 50, p 102.

3 In New Zealand I gave courses of lectures on noninductivist methods of science to the Christchurch branch of the Royal Society of New Zealand and the Medical School in Dunedin. These were initiated by Professor (later Sir John) Eccles. During my last two years at Christchurch I have lunchtime lectures to the teachers and students of the Canterbury University College. All this was hard work (today I cannot imagine how I did it) but extremely enjoyable. In later years I have met former participants in these courses the world over, scientists who assured me that I had opened their eyes – and there were some highly successful scientists among them (Popper 1974, p 138).

4 Nobel 1963.



As Eccles exclaimed, “I can now rejoice even in the falsification of a cherished theory, because even this is a scientific success.”<sup>1</sup>

Does the concept of “joyful falsification” mesh with your central outlook? If so, perhaps you will cherish this letter.

There is no shame in acknowledging and correcting an error. Shame lies only in the refusal or inability to comprehend and correct an error. Naturally, I have made countless extraordinary errors, one of which was a two-year, heavy-artillery assault upon *The Problem of Global Warming*. Although this effort turned out to be a fantastic belly-flop, and happened to represent a failure to grasp the *true nature* of *The Problems of Sustainable Economic Development and Global Warming* (much as you have failed to grasp these problems). However, this error seems to have charted a course much closer to the truth: I submit I was only able to arrive at the conjectures and refutations presented herewith through the (1) recognition, and (2) correction of false assumptions associated with this error: see APPENDIX V: THE SEA II for a post-priori snapshot. Correcting this mistake wasn't easy for me (for I was essentially entrenched in the same, flawed assumptions in which you are presently imprisoned), and although nobody wrote me a letter to help sort it all out, I've certainly had more than my fair share of assistance; I hope that I am deft enough to help you dispel these inconvenient myths and illusions,<sup>2</sup> break down imprisoning doors of perception,<sup>3</sup> and enable you to correct your error, and, perhaps, chart a new course as well. But then again, I realize how strong these myths and doors<sup>4</sup> may be, and thus realize the breadth of the challenge before me. I have not written this letter to be

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1 Eccles 1963 cited in Popper 1963, p 2.

2 (a) The results of failure in politeness, however bad from the point of view of social occasion, are admirable from the point of view of dispelling myths. There are two ways in which our natural beliefs are corrected: one the contact with fact, as when we mistake a poisonous fungus for a mushroom and suffer pain in consequence; the other, when our beliefs conflict, not directly with objective fact, but with the opposite beliefs of other men (Russell 1928 pp 17-18).

(b) The search for happiness based upon untrue beliefs is neither very noble nor very glorious. There is a stark joy in the unflinching perception of our true place in the world, and a more vivid drama than any that is possible to those who hide behind the enclosing walls of myth (Russell 1928, p 21).

3 If the doors of perception were cleansed every thing would appear to man as it is... For man has closed himself up, till he sees all things through narrow chinks of his cavern (Blake 1790).

4 (a) Festinger 1957.

cruel; it is not my intent to ridicule you. In fact, as I have stated, I do suspect you may be a great man. But, following in the footsteps of Popper, Russell, Pyrrho,<sup>1</sup> and Socrates,<sup>2</sup> I have accepted an obligation to stand my post, remain ever on the lookout, and never hesitate to table criticism. Indeed, our survival may depend upon it.<sup>3</sup>

Did you notice the brief outline of my “UNIFIED THEORY OF THE BIOLOGICAL AND SOCIAL SCIENCES & SOLUTION TO THE PROBLEM OF SUSTAINABLE ECONOMIC DEVELOPMENT” I clipped to the top of this letter?<sup>4</sup> If you considered the axioms carefully, perhaps your great mistake has already occurred to you. I did endeavour, after all, to make this lesson as simple as possible for you to understand. If it hasn't occurred to you yet, note that your assumptions, the framework upon which all of your works have been based for at least the past two decades, are contained within axioms I through III. Although I am not a gambling man, I believe you will discover your mistakes may be directly related to the fact that you have failed to comprehend inherent uncertainties associated with axioms IV through VII (of which, more to follow). I've noted errors are nothing to be ashamed of; this error is especially free of disgrace, since *all* of your fellow practitioners of your so-called “ecological economics” (as well as many other economists, naturally) have committed, and continue to commit the exact same error. Yes, I believe you will discover that this discourse is not simply a refutation of your *Nature in Economics*, but ultimately a falsification of the theoretical framework and central thesis of “ecological economics.”

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(b) I began to intellectually reject some of the delusionally influenced lines of thinking which had been characteristic of my orientation. This began, most recognizably, with the rejection of politically-oriented thinking as essentially a hopeless waste of intellectual effort (Nash 1994, pp 6-7).

- 1 Sceptic: A seeker of truth. One who, like Pyrrho and his followers in Greek antiquity... holds that there are no adequate grounds for certainty as to the truth of any proposition... Those who deny the competence of reason, or the existence of a justification for certitude, outside the limits of experience. The difference between the two usages becomes clearer when considering ‘sceptic’s’ Latin origin (scepticus): inquiring, reflective, assumed by the disciples of Pyrrho as their distinctive epithet... to look out (OED 1997).
- 2 I am wiser than this man, for neither of us appears to know anything great and good; but he fancies he knows something, although he knows nothing; whereas I, as I do not know anything, so I do not fancy I do. In this trifling particular, then, I appear to be wiser than he, because I do not fancy I know what I do not know (Socrates 399 BC).
- 3 If our civilization is to survive, we must break with the habit of deference to great men. Great men may make great mistakes... Their influence, too rarely challenged, continues to mislead those on whose defense civilization depends, and to divide them. The responsibility for this tragic and possibly fatal division becomes ours if we hesitate to be outspoken in our criticism of what admittedly is a part of our intellectual heritage. By our reluctance to criticize some of it, we may help to destroy all of it (Popper 1945, inscription).
- 4 See APPENDIX I.

Ever since Menger's *Grundsätze der Volkswirtschaftslehre (Principles of Economics)*,<sup>1</sup> conscientious economists have understood the implications of *The Problem of Value*; ever since the *Silent Spring* of 1962, conscientious people everywhere have understood *The Problem of Value*. Unfortunately, this wide understanding has culminated in an errant quest for *Sustainable Economic Development*. Over the past forty years, the landfill of literature dedicated to this misguided quest has revealed a fundamental, universal error: those most able to navigate the perilous seas<sup>2</sup> of economics,<sup>3</sup> mistakenly assert that neoclassical economic theory fails to pass the test of the second law of thermodynamics,<sup>4</sup> then proceed to report that, based upon this “revolutionary new perspective”, we are now positioned to “reshape economic theory and policy”.<sup>5</sup> The problems which appear to consistently elude you all is, once again, (1) economics is a *derivative*<sup>6</sup> science, not a *primary* science,<sup>7</sup> and (2) you have failed to recognize critical

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1 1871.

2 There are ‘perilous seas’ in the world of thought, which can only be sailed by those who are willing to face their own physical powerlessness. And above all, there is liberation from the tyranny of Fear, which blots out the light of day and keeps men grovelling and cruel. No man is liberated from fear who dare not see his place in the world as it is; no man can achieve the greatness of which he is capable until he has allowed himself to see his own littleness (Russell 1928, pp 22).

3 See Bibliography for many examples; Gowdy, for example, has also consistently failed and continues to fail to make this connection.

4 Economic theory has always maintained that economic value is “generated” solely within the economy where it is fully distributed among the factors of production before being “consumed”. According to this theory, the economy is an isolated system that does not need flows to pass across its boundaries in support of its steady state (“general equilibrium”). From a thermodynamic point of view this idea is unacceptable. According to thermodynamic theory, any open system, which allows flows of matter and energy to cross its boundaries, is capable of maintaining itself in steady state only because it “transport” value from its environment to restore the value that has been “consumed” within the system and dissipated. Drawing on the analogy with thermodynamics, this paper replaces the traditional systemic analog of the economy, which is the closed “circular flow” process, with the steady flow process. According to this analog, any efficient economy is an open system both physically and economically requiring a “flow” of economic value to maintain its steady state. In other words, an economically isolated system has to be inefficient and is bound to misallocate and overuse environmental resources. Whether the economy behaves as an economically isolated (inefficient) or open (efficient) system is an empirical question. However, if real economies are economically open and efficient, and environmental resources are abused due to the economy's unrestrained material growth, parts of traditional economic theory, especially those related to benefit evaluation, will have to be modified. Policy recommendations will be affected in any case because internalization, the panacea of resource misallocations, cannot be more than a temporary solution. Instead of opening the economy, internalization encloses the harmed resource and saves it by abusing excessively other environmental resources (Amir 1994, abstract).

5 The policy recommendations of most economists are driven by a view of economic reality embodied in Walrasian general equilibrium theory. Ironically, the Walrasian system has been all but abandoned by leading economic theorists. It has been demonstrated to be theoretically untenable, its basic assumptions about human decision making have been empirically falsified, and it consistently makes poor predictions of economic behaviour. *The current revolution in welfare economics offers opportunities on two related fronts for an evolutionary perspective on human behaviour to reshape economic theory and policy....* Expanding the role of economic analysis beyond stylized market behaviour to focus on well-being (real utility) has far-reaching consequences for microeconomic policy... Abandoning the Walrasian model also means rethinking the microfoundations approach to the economic analysis of sustainability. This opens the door for economists to engage with the growing body of research on the evolution of whole societies (Gowdy 2006, abstract).

6 See page 15: footnote 3.

7 Robinson 1962, p 117.

assumptions (Axioms IV-VII), and of course this is not so unusual either. As Coase noted long ago:

economic theory has suffered in the past from a failure to state clearly its assumptions. Economists in building up a theory have often omitted to examine the foundations on which it was erected. This examination is, however, essential not only to prevent the misunderstanding and needless controversy which arise from a lack of knowledge of the assumptions on which a theory is based, but also because of the extreme importance for economics of good judgement in choosing between rival sets of assumptions.<sup>1</sup>

Take, for example, a recent reformulation of ecological economics' central thesis from one of your so-called "field's" founding fathers, Herman E. Daly<sup>2</sup> (*ECONOMICS IN A FULL WORLD*, *Scientific American*, September 2005, Vol. 293, Issue 3):

But the facts are plain and *uncontestable*: the biosphere is finite, nongrowing, *closed* (except for the constant input of solar energy), and constrained by the laws of thermodynamics. Any subsystem, such as the economy, must at some point cease growing and adapt itself to a dynamic equilibrium, something like a steady state.

But are the *facts plain and uncontestable*? Is the biosphere *finite and closed*? No, two strikes, wrong on both counts. Daly has failed, as you have failed, to grasp that greatest truth of all truths.<sup>3</sup> Go back and look at those axioms again. Pay attention to Axioms IV and (especially) Axiom V. Think about it: it's *not* a closed system, is it? The facts are not *plain and uncontestable*, are they? I suspect by now you may feel a bit nauseated, perhaps like an obedient sheep who has blindly followed a drunken shepherd over a cliff, in that very brief interval between terminal velocity and the rocks just below. Perhaps by now you are beginning to understand that this letter is not a joke. Please try not to take it personally (in fact, perhaps you may want to imagine that the letter has been written to Daly (or Amir or Gowdy, etc.) instead, for this critique is as applicable to their positions—and countless others—as it is to yours). Yes, I am wiser than you, and I am wiser than Daly, because I would never be so incredibly naïve to state

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1 1930, p 386.

2 DALY is a professor in the School of Public Policy at the University of Maryland. From 1988 to 1994 he was senior economist in the environment department of the World Bank, where he helped to formulate policy guidelines related to sustainable development. He is a co-founder and associate editor of the journal *Ecological Economics* and has written several books (Daly 2005). Also see Daly 1971.

3 The Socratic maxim that the recognition of our ignorance is the beginning of wisdom has profound significance for our understanding of society.... This fundamental fact of man's unavoidable ignorance of much on which the working of civilization rests has received little attention. Philosophers and students of society have generally glossed it over and treated this ignorance as a minor imperfection which could be more or less disregarded.... Perhaps it is only natural that the scientists tend to stress what we do know; but in the social field, where what we do not know is often so much more important, the effect of this tendency may be very misleading (Hayek 1960, pp 22-23).

that *any* facts are *plain* and *uncontestable*. Indeed, I readily consent that all the gold and diamonds I offer herewith may be but pyrite and plexi-glass.

And since it seems that you have difficulty handling complexity and uncertainty, I will make this critical point regarding “ecological economics” false and sandy foundation even more self-evident, with two simple pictures, which compare and contrast the theoretical framework of “ecological economics” with the theoretical framework of *The Funk-Zweikampf Solution*. My five year old son, William, drew them for you, and you will find them in

#### APPENDIX VII: THE EARTH.

If you have entered into a state of aesthetic arrest, transfixed by the beauty of seven simple axioms (or two simple drawings by a five year old boy) which pound a wildly popular school of economic thought to dust and present a tenable solution to *The Problem of Sustainable Economic Development*, you may, upon regaining your senses, ask yourself, “How did Matt Funk come to understand an essential truth that I, Daly, Nicholas Georgescu-Roegen, William Kapp,<sup>1</sup> Karl Polanyi,<sup>2</sup> E. F. Schumacher,<sup>3</sup> Röpke,<sup>4</sup> Splash,<sup>5</sup> Norgaard,<sup>6</sup> Daily,<sup>7</sup> McCauley,<sup>8</sup> Farley,<sup>9</sup> Hawken,<sup>10</sup> Constanza,<sup>11</sup> Olson,<sup>12</sup> Gowdy, and *literally thousands* of other “economists” have failed to understand?

In short, it has been a long and eventful journey, but I will patiently endeavour to chart the course which I have followed...

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And so begins the second instalment of this discourse.

Please feel free to let me know, Dear Ålanders, if you would like me to forward a copy of this paper.

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1 1950.

2 1944.

3 1973.

4 2004 ; 2005.

5 1999 ; 2007.

6 1994 ; Norgaard & Bode 1998.

7 1997.

8 2006.

9 Daly & Farley 2004.

10 1994 ; Hawken, Lovins et. Al 2000.

11 et al 1997.

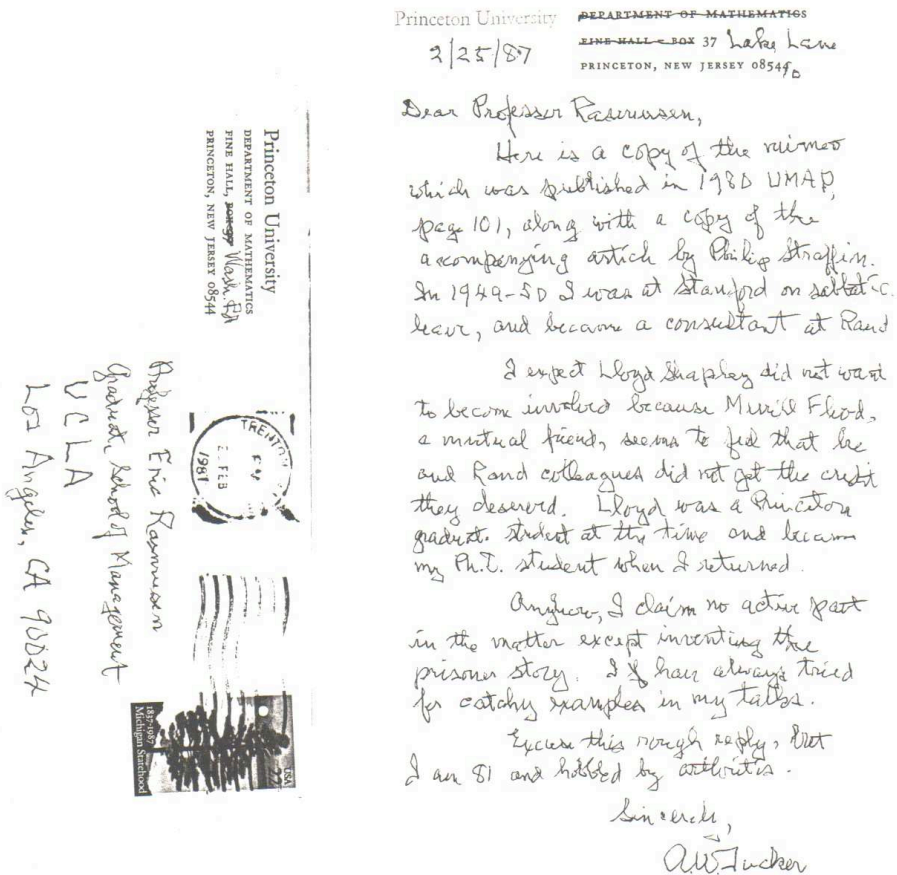
12 Et al 1996.

### APPENDIX III: THE PRISONER'S DILEMMA

5 June 2005 Eric Rasmusen (erasmuse@indiana.edu) notes...

Albert Tucker, "A Two- Person Dilemma," unpublished notes (May 1950)

When I was writing the first edition of Games and Information back in the 1980's I was confused by the varying citations give for The Prisoner's Dilemma. I asked Lloyd Shapley about it, since he was there at the founding, and he referred me to Albert Tucker. Professor Tucker replied with this letter [see next page] telling me about his Stanford handout [see third page] and the article by Straffin that tells the story, Philip Straffin, "The Prisoner's Dilemma," UMAP Journal. 1: 101-103 (1980). I republished both in Readings in Games and Information.<sup>1</sup>



<sup>1</sup> (Rasmusen 2005).

See UMAP Journal 1 (1980) 101-103.

A TWO\*PERSON DILEMMA

Two men, charged with a joint violation of law, are held separately by the police. Each is told that

- (1) if one confesses and the other does not, the former will be given a reward of one unit and the latter will be fined two units,
- (2) if both confess, each will be fined one unit.

At the same time each has good reason to believe that

- (3) if neither confesses, both will go clear.

This situation gives rise to a simple symmetric two-person game (not zero-sum) with the following table of payoffs, in which each ordered pair represents the payoffs to I and II, in that order:

		II	
		confess	not confess
I	confess	(-1, -1)	(1, -2)
	not confess	(-2, 1)	(0, 0)

Clearly, for each man the pure strategy "confess" dominates the pure strategy "not confess." Hence, there is a unique equilibrium point\* given by the two pure strategies "confess." In contrast with this non-cooperative solution one sees that both men would profit if they could form a coalition binding each other to "not confess."

The game becomes zero-sum three-person by introducing the State as a third player. The State exercises no choice (that is, has a single pure strategy) but receives payoffs as follows:

		II	
		confess	not confess
I	confess	2	1
	not confess	1	0

\*see J. Nash, PROC. NAT. ACAD. SCI. 36 (1950) 48-49.

Stanford, May 1950

A. W. Tucker

## APPENDIX IV: THE PROBLEMS OF RELIGION & SUBJECT MATTERS

Godfrey Baldacchino wrote:

I should be there on Monday... but, if you wish, I can arrange something more 'formal' - with an invitation issued to all members of the Faculty... Even later on during next week - say, Thursday, 2 to 3.30pm - so we don't have to listen to two presentations back to back...

I have asked Matt to consider a presentation comparing development policy in Barbados and Mustique...

Some more good news: we may have a MAIS grad course in island biogeography on offer as from next September. Courtesy of Dr Marina Silva (Dept of Biology).

Matt Funk wrote:

A formal invite to the department would be great; I'd be happy to deliver a Barbados/Mustique/Sustainable Economic Development seminar....

Very exciting news about the Biogeographical course offering, by the way, as the more I read on this topic, the more I understand the basis for Bowman's conjecture (1994): "Since biogeography holds the key to the survival of life, it deserves more attention." But I also believe his conjecture is ultimately incorrect, since have also become more acutely aware that "Biogeography" does not exist. And it is in fact unfortunate that there are many who mistakenly believe that it (and every other subject matter) exists. I'm sure you will all recall my emphasis on Popper's (1956) notion that subject matters do not exist; please consider this notion yet again in this light:



*It is easy to call for interdisciplinary syntheses, but will anyone respond? Scientists know how to train the young in narrowly focused work; but how do you teach people to stitch together established specialities that perhaps should not have been separated in the first place? Early in this century the specialities of biology and chemistry were joined to form biochemistry; similarly, economics and ecology are now in the process of being combined into ecological economics.*

*My first attempt at interdisciplinary analysis led to an essay, "The Tragedy of the Commons." Since it first appeared in Science 25 years ago, it has been included in anthologies on ecology, environmentalism, health care, economics, population studies, law, political science, philosophy, ethics, geography, psychology, and sociology. It became required reading for a generation of students and teachers seeking to meld multiple disciplines in order to come up with better ways to live in balance with the environment.*

*I did not start out intending to forge an interdisciplinary link, but rather to present a retiring president's address to the Pacific division of the American Association for the Advancement of Science. But even after six revisions, each quite different from the one before, my summary of an ecologist's view of the human overpopulation problem would not crystallize. Repeatedly, I found fault with my own conclusions (Hardin 1998).*

The reason I say that it is unfortunate that "Biogeography" exists, is because its methods are absolutely *essential* to understanding "island studies," and it is very easy to see how many scholars may never dig into this "specialty". It is rather ironic that Spellerberg & Sawyer's (1999) "An Introduction to Applied Biogeography (the best introduction I have been able to discover) reaches the same conclusion (Indeed, it was rather lucky that I stumbled into it. I've attached Hardin 1998 (which contains the citation above) and Hardin 1968.



Again, *there are only problems, and our urge to solve them*. If we must insist on subject matters, there is only one subject and it is called "Nature" or perhaps "Biology," and all other problems fit into these laws, as even art and even the laws of physics must be held within the biological realm, since biological organisms form, evaluate, and utilize both the laws of physics and works of art.

Remember, Darwin was not a "evolutionary biologist" or even a "biologist," he was a *Naturalist*. One of the most influential books he read while onboard *The Beagle* was a work by a so-called economist (Malthus, whom also happened to influence Lloyd, of which more to follow). How many "economists" today take time to seek out relevant works in "evolutionary biology"? How many biologist read economics? Although I believe it is fair to say that the answer to both questions is "more than ten years ago," as Hardin noted above, perhaps these "subjects" *should not have been separated in the first place*. I will also suggest that it is no coincidence that, although "The Tragedy of the Commons" is cited by economists more often than any other specialist, Hardin was in fact a biologist.

Another important element I will briefly share is this: If a scholar does not completely understand and accept the fundamentals of what we refer to as evolutionary biology, very close to nothing else will be understood, and his or her analysis is likely to demonstrate this deficit. I believe it may be unfortunate that one may be conferred with a PhD in "Economics" (and every other social science, for that matter) without first (or concurrently) producing a PhD dissertation in Biology (and preferably evolutionary biology,<sup>1</sup> or perhaps at the very least, evolutionary game theory),<sup>2</sup> as I have discovered that economics without evolutionary biology is about as effective as letters without a language. The famous evolutionary geneticist Theodosius Dobzhansky remarked that, "nothing in biology makes sense except in the light of evolution,"<sup>3</sup> but he had only glimpsed the tip of the iceberg: *nothing on Earth makes sense except in the light of evolution!*

I would like you all to carefully consider the six pages which make up Hardin 1968: I submit that if, for example, we had (1) read and discussed these six pages, and (2) agreed to accept the central thesis, (which I realize may not have occurred) then (3) we would have systematically provided solutions for very close to 100% of the problems which we had grappled with many – if not most – of our seminars for the past year. Yes, it is true that one may formulate developmental arguments based upon what are essentially religious grounds (such as a belief in the redistribution of wealth and so-called "inalienable, global human" rights - just who or how the wealth is to be redistributed and how these "global" rights are to be insured is another story), but the burden of proof will be heavy on their hands, as the empirical evidence in favour of evolutionary biology is far greater than the empirical evidence in favour of the existence of god/s.

If you decide to accept and utilize the arguments I'm submitting herewith, and should find yourself criticized for being a "Social Darwinist," kindly thank your critic for essentially calling you a "biologist," because what he or she has unwittingly stated is that you are *logical* and *rational*.

Finally, please consider the following, for I have found that the deep roots of religion, nationalism, and "social norms" may combine to make *nothing more difficult* than to always bear the following in mind:

Nothing is easier than to admit in words the truth of the universal *Struggle for Life*, or more difficult--at least I have found it so--than constantly to bear this conclusion in mind. Yet unless it be thoroughly engrained in the mind, I am convinced that the whole economy of nature, with every fact on distribution, rarity, abundance, extinction, and variation, will be dimly seen or quite misunderstood.

---

1 (a) Among the things that science does know, evolution is about as certain as anything we know (Dawkins 2004).

(b) The two basic questions in evolutionary biology are (1) how does evolution occur and (2) why does evolution occur? The first is a question of mechanisms and the second is a question of influences on those mechanisms (Grant 1998, p 1).

2 See Cressman 1996, Kolstad 2007, Sigmund & Nowak 1999, Stumpf 2001, Vincent 1996, and many excellent works by Weibull.

3 Wilson 2006, p 1479.

We behold the face of nature bright with gladness, we often see superabundance of food; we do not see, or we forget, that the birds which are idly singing round us mostly live on insects or seeds, and are thus constantly destroying life; or we forget how largely these songsters, or their eggs, or their nestlings, are destroyed by birds and beasts of prey; we do not always bear in mind, that though food may be now superabundant, it is not so at all seasons of each recurring year (Darwin 1859, p 62).

Think about this carefully, for in this light you will find *cooperative behaviour*, *kin selection*, *reciprocity*, etc, but you will not find *social justice*. For, once again, who do you propose would administer this "social justice"? The wise owl? The noble lion? Ah, but some will say, "but we are *different!*" Somehow, one single species on Earth (humans) is somehow different than all of the rest. Well, I'm afraid, once again, the burden of proof in this argument is, once again, on their hands,<sup>1</sup> for, again, the argument is essentially religious/irrational.<sup>2</sup> When Nietzsche said "God is dead," what he was trying to say was "God will not protect your nest, God will not collect insects for you, money does not grow on trees, etc. - you must *fight* for your own survival (including your family's survival, your community's survival, your nation's survival, etc.). And yes, more organisms will perish than will survive (and this holds true for *every* species, including ants, bees, birds, humans, hogs, fish, dragonflies, etc.). In evolutionary biology, this is referred to (and, moreover, accepted) as *The Ground Zero Premise*. Even Bertrand Russell, perhaps the greatest logician of the past century, was not able to fully grasp the true nature of this premise.<sup>3</sup>

I would also like to suggest that Hardin's "Tragedy of the Commons" serve as a required text for the Introduction to Island Studies course, as this phrase serves as useful shorthand when it is fully understood, and may help accelerate the learning process when it comes to understanding islands, and thus, understanding the world in which we live.

I Hope you all find this more interesting than tedious; I'm interested and open to any comments and criticisms you may have to offer (including comments or criticisms from Dr Silva and/or other members of our biology department!). I've also CC'd Faiz since I value his criticism and suspect he may strongly disagree; if someone is brave enough to forward to Ariana (I do not have her email), I suspect she may disagree even more adamantly...

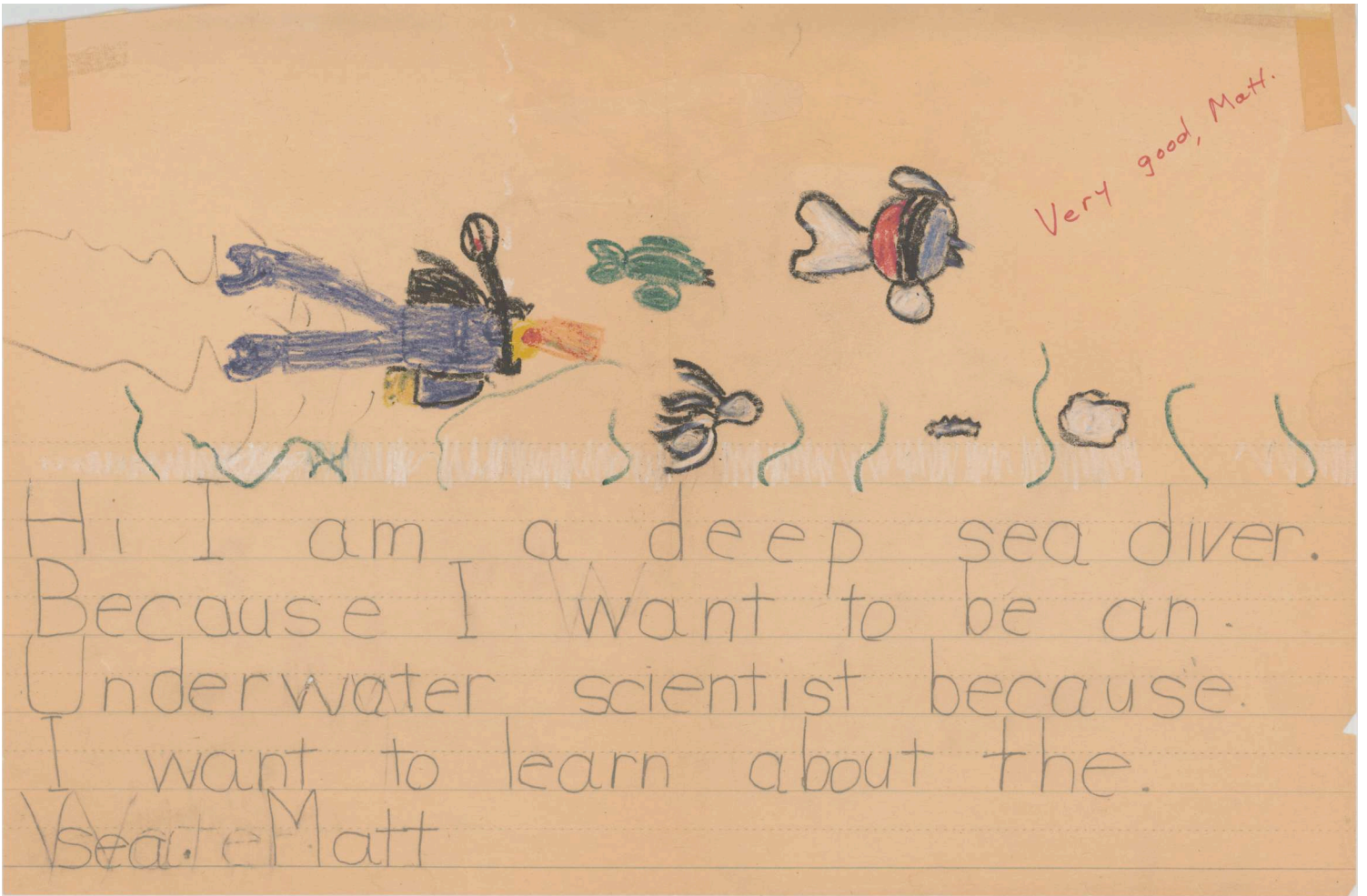
Hope to see you all on Monday...Matt

PS: I have attached a third Hardin paper (1974) which may also brew interesting discussions over coffee, as well as an excellent PNAS paper(which I have found to be the single best source for my research purposes) from last week, which, I believe demonstrates how relevant Hardin is yet today. Note the first citation in this PNAS paper is Hardin 1968. I will also add that this citation is *incorrect*, or, at the very least, inadequate, since Hardin did *not* in fact first formulate "The Tragedy of the Commons." - Hardin's work was based upon a much earlier finding by Oxford economist, WF Lloyd (1833), whose work I have also attached; Lloyd's promethean vision was extraordinary.

- 
- 1 I am aware that the conclusions arrived at in this work will be denounced by some as highly irreligious; but he who denounces them is bound to shew why it is more irreligious to explain the origin of man as a distinct species by descent from some lower form, through the laws of variation and natural selection, than to explain the birth of the individual through the laws of ordinary reproduction (Darwin 1883, p 1242).
  - 2 Those whom we called brutes had their revenge when Darwin shewed us that they are our cousins (Shaw 1903, ln 129).
  - 3 Our instinctive apparatus consists of two parts -- the one tending to further our own life and that of our descendants, the other tending to thwart the lives of supposed rivals. The first includes the joy of life, and love, and art, which is psychologically an offshoot of love. The second includes competition, patriotism, and war. Conventional morality does everything to suppress the first and encourage the second. True morality would do the exact opposite. Our dealings with those whom we love may be safely left to instinct; it is our dealings with those whom we hate that ought to be brought under the dominion of reason. In the modern world, those whom we effectively hate are distant groups, especially foreign nations. We conceive them abstractly, and deceive ourselves into the belief that acts which are really embodiments of hatred are done from love of justice or some such lofty motive(Russell 1928, p 13).

APPENDIX V: THE SEA I

Matt Funk c. 1974



Hi I am a deep sea diver.  
Because I want to be an  
Underwater scientist because  
I want to learn about the  
Sea. Matt

APPENDIX VI: THE SEA II

JAN-14-2005 16:08

McINTOSH & OTIS

212 687 6894

P.01/01

~~CONFIDENTIAL~~

*Matt,  
I think Henry didn't  
show this to you, because  
he didn't necessarily agree  
w/ what Eric was saying here.  
I thought you might want to  
see it though.  
Best,  
Jessica Mael*

9/28/2004

Dear Henry,

This letter is a response to Matt Funk's Song of the Dragonfly. As we have discussed, I think Matt has tremendous talent, and Song of the Dragonfly has the potential to be great first novel. I am very much interested in working with Funk, but in order to further consider it for publication I think I need to get a few concerns addressed. I was very confused as to what kind of story I was reading as this has all sorts of elements that make for a hodgepodge of genres. Its one part of each: fantasy, action/adventure, romance, mystery, and I was often blown away by his science. I can honestly say that I learned a lot from this book.

But the most important issue for a story like this to work is that the reader must be able to suspend disbelief, and that seems to be the hardest thing for me to do. The mass migration seems pretty implausible, even fantastical. But this happens within a very real environment---a very reality based world in which something bizarre has surfaced---filled with relationship troubles and such, and that has the reader back and forth between a fantastical underwater revolution and two people battling their personal and relationship problems. It's like a tug-of-war, with all the tension on the reader. And this tears me in two. Funk's strengths seem to be very much in the reality-based world. He has a great anecdotal style that fleshes out very real characters and offers real-life "lessons" (so to say). But I feel that for a story like this (a man coming to terms with the interconnected Earth, and learning valuable environmental lessons from abizzare gathering of marine mammals), it is best told with many fantastical twists, and would require more elements of the surreal and fantastic.

You brought up the comparison of the early Jonathan Lethem books we did here and they offer up a great example. They suck you into a world where the real has been twisted into a satirical fantasy of dreams and visions, allow you suspend disbelief (as anything in this world is possible), and drag you through philosophical wanderings. But also Funk may be carving out something entirely fresh and needed, the environmental novel. But I think in order for this to work he might need to create some very real environmental situations rather than more fantastical ones.

So I ask you this, do you think that Funk will consider revisiting the book in either a more science-based / reality-based way or maybe a more surreal, fantastic way? I'd be happy to discuss this with Funk if you want me to. I realize that this is more than I alluded to prior, but I feel it is very much necessary. Let me know what you think.

Sincerely,

Eric Raab  
Assistant Editor

*P.S. I'm  
going to try  
and catch  
up on some  
reading over  
the long weekend  
May be we  
can talk next  
I read your  
book!*

TOTAL P.01

## APPENDIX VII: THE EARTH<sup>1</sup>

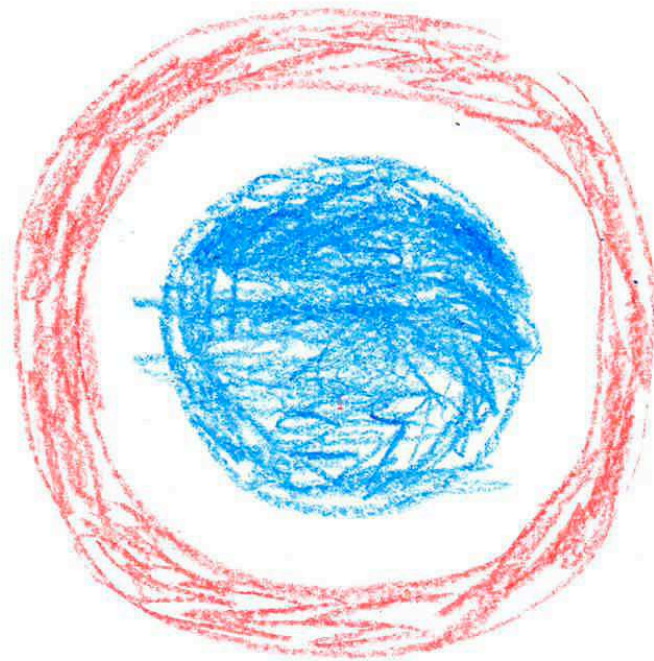
[The author is saddened to report that the digital file holding this artwork did not make our trans-Atlantic journey. However, please refer to the artwork on the following page and imagine the blue marble in this middle represents this piece.]

This excellent drawing represents the theoretical framework of “ecological economics.” The blue represents the Earth, the biosphere and all of its inter-connected systems, which are, naturally, beholden to the second law of thermodynamics. Although “ecological economists” refer to this as a “whole-systems” approach; as you will see on the next page, they “forgot” two systems. This framework is represented in Axioms I-III.<sup>2</sup>

---

1 Artwork courtesy of William Matthew Funk © 2008.

2 See APPENDIX I.



This excellent drawing represents the theoretical framework of *The Funk-Zweikampf Solution*.

Note that, in addition to the axioms represented in the previous drawing (in blue), this framework also recognizes two additional, fundamental assumptions:

(1) *political uncertainty* (white), and (2) *planetary uncertainty* (red).

As you can see, this is the “bigger picture,” so to speak.

This framework is represented in Axioms I-VI.<sup>1</sup>

---

<sup>1</sup> See APPENDIX I.

## APPENDIX VIII: FIELD NOTES FROM MUSTIQUE

For the past several months, prior to engaging in the correspondence below, I reviewed a half-dozen relevant books, several two dozen papers, and a documentary film which all related to the Caribbean, St. Vincent & the Grenadines, and Mustique. On the final page of Goldsmith 1973, (which I will gladly forward upon request), one entry in particular on this final page of references caught my eye:

LLEWELYN-DAVIES, WEEKS, FORESTIEK-WALKER & BOR, 1970. *Mustique: proposals for a development study*. Unpubl. Report

Although I suspected that this unpublished report might serve my research well, of course I would never know unless I were able to obtain a copy of the report. Also, naturally, since I was not certain that I would in fact procure this report and, moreover, was uncertain what else I might be able to discover, I tried to cast several wide nets, as I endeavour to hold close the Novalis inscription in Popper's *The Logic of Scientific Discovery*: "*Hypotheses are nets: only he who casts will catch.*"

With that said, here it is:

> \*From:\* Matt Funk [mailto:matt@covehead.org]  
> \*Sent:\* Wednesday, March 19, 2008 12:05 PM  
> \*To:\* rmahon@caribsurf.com  
> \*Subject:\* Mustique  
>  
> Greetings from the Institute of Island Studies, Robin!  
>  
> I've been studying your work for the past several months, and, as I'm  
> headed to Barbados on Saturday, and then heading over to Mustique on  
> Monday, I hope that you may have some time to meet.  
>  
> Over the past year I've developed an Economic Theory of Value based  
> upon relative Insularity - and although most of those efforts have  
> been directed toward Iceland, when I discovered the curious case of  
> Mustique several months ago, I realized it served as a far more  
> descriptive model for my solution than any island I've encountered to  
> date. I've attached an Abstract and the slides from a presentation I  
> gave last week (no doubt you'll recognize some insights from your  
> works!).  
>  
> While on Mustique next week, I intend to develop a study which I may  
> begin, but plan to conduct in earnest when I return in November.  
> Generally speaking, I'm looking to assess the relative successes and  
> failures (my preliminary research, as you will see from my two  
> attachments, anticipates I may discover more successes than failures)  
> as they relate to the adherence to the development suggestions set

> forth in LLEWYN-DAVIES, WEEKS, FORESTIEK-WALKER & BOR, 1970.  
> *Mustique: proposals for a development study*, unpublished/. To date,  
> however, I have not been able to obtain a copy of this original  
> report. (Of course I would be very glad to hear if you knew where I  
> might find one I would also be grateful to know who commissioned this  
> report). Thus my research endeavours will most likely be based upon  
> the details from Goldsmith's 1973 /The ecologist's role in development  
> for tourism: a case study in the Caribbean/ (which, I'm sure you may  
> know, is a review of this 1970 report; if you haven't reviewed this,  
> I'll forward it).  
>  
> Naturally, I would be very grateful for any general insights you may  
> have to offer, and if you have time to get together on either island,  
> that would be great. Depending upon which day may be available, we may  
> have an extra room for you and a guest (my wife and I are guests on  
> this trip, but I understand the home we're staying at is substantial;  
> also, we're renting a house for a week in November and I would very  
> gladly host a Mustique get-away then as well).  
>  
> In any case, we'll be on Barbados the 22nd-24th (arriving this  
> Saturday), then on to Mustique for a week late on the 24th.  
>  
> Are there any library and/or bookstore (UWI? CERMES?) resources I  
> should explore while on Barbados? I have not yet procured a good topo  
> map nor a nautical chart - would I find these on Barbados as well?  
> Also, if you have any relevant papers which are not archived on the  
> CERMES site (I have read your excellent works posted there), I would  
> also be grateful for those. Any other suggestions? Also, has anyone  
> surveyed the turtle populations on Mustique? Are there any notable and  
> relatively readily surveyed Mustique endemics?  
>  
> Finally, I will add that I hold your *Coastal resources and*  
> *livelihoods in the Grenadine Islands: Facilitating Change in*  
> *Self-organizing Systems* in utmost high-regard, and it has influenced  
> my research significantly. If you think any of your co-authors on this  
> piece (or anyone else for that matter) would find mutual benefit in  
> exchanging ideas and drinking iced tea with me (on Barbados, Mustique,  
> or elsewhere in the Grenadines), please feel free to forward my email  
> and/or attachments.  
>  
> I hope to meet you next week!  
>  
> Sincerely...Matt Funk

---

Mahon, Robin wrote:

> Dear Matt,  
>  
> So nice to hear form someone with similar interests especially an  
> interest in the Grenadines. I'll try to answer some of your questions  
> below, but first to note that your visit is over Easter weekend and  
> that both Good Friday and Easter Monday are holidays in Barbados.



> Everything will be closed, UWI included. It also happens that this  
> weekend I have a family reunion here with folks from the UK,  
> Australia, Jamaica and US converging. The week end is packed out. I  
> would like to meet up with you but it will have to be November.  
>  
> Regarding the reports you mention, to be honest we have not paid  
> Mustique much mind. They do not seem particularly interested in the  
> rest of the Grenadines, although Peter Ernst has tried to engage them.  
>  
> I believe that Julie Horrocks has done some turtle nesting work there  
> [julia.horrocks@cavehill.uwi.edu](mailto:julia.horrocks@cavehill.uwi.edu)  
> <<mailto:julia.horrocks@cavehill.uwi.edu>> Also Father Mark De Silva  
> [mayreau@caribsurf.com](mailto:mayreau@caribsurf.com) <<mailto:mayreau@caribsurf.com>> has recently  
> completed a very nice book on the biota of Mustique with input from  
> Diane Wilson of Mustique [dianne@vincysurf.com](mailto:dianne@vincysurf.com)  
> <<mailto:dianne@vincysurf.com>> .  
>  
> Re charts, the Imray-Iolaire nautical charts for yachters are among  
> the best and are fairly readily available on St. Vincent and in Bequia.  
>  
> Best of luck with your visit and hopefully we can meet up in November.  
>  
> All the best  
>  
> Robin  
>  
> Robin Mahon  
>  
> Professor of Marine Affairs and Director  
>  
> Centre for Resource Management and Environmental Studies (CERMES)  
>  
> University of the West Indies, Cave Hill Campus  
>  
> Barbados  
>  
> Phone 246-417-4570, Fax 246-424-4204

-----Original Message-----

From: Matt Funk [<mailto:matt@covehead.org>]  
Sent: Friday, March 21, 2008 10:55 PM  
To: Mahon, Robin  
Subject: Re: Mustique

Thanks for the great insight, Robin - and the contacts, I've made plans to connect with Father Mark and hope to hear back from the other two. I'm sorry I won't have the opportunity to meet you on this trip, I hope we can connect in November....

Too bad to hear The Mustique Co. is not particularly interested, especially considering it would even serve selfish interests: The transboundary issues make the Caribbean - SVG in particular - especially problematic. I actually find it rather odd that they wouldn't be at the forefront of conservation efforts in SVG,

especially the near-neighbouring islands.

In any case, thanks again and enjoy your holiday with your family!  
Happy Easter...Matt Funk

PS: You might find this Goldsmith paper of some interest.

----- Original Message -----

**Subject:**RE: Mustique

**Date:**Sat, 22 Mar 2008 06:43:20 -0400

**From:**Robin Mahon <[rmahon@caribsurf.com](mailto:rmahon@caribsurf.com)>

**To:**'Matt Funk' <[matt@covehead.org](mailto:matt@covehead.org)>

Thanks for the Paper Matt. And, I too was surprised at the lack of interest even if only for selfish interests and to obtain some good press.

Robin Mahon  
Professor of Marine Affairs and Director  
Centre for Resource Management and Environmental Studies (CERMES)  
University of the West Indies, Cave Hill Campus  
Barbados  
Phone 246-417-4570, Fax 246-424-4204

---

On Mar 18, 2008, at 3:53 AM, Matt Funk wrote:

Greetings from the Institute of Island Studies on Prince Edward Island!

Just wondering if you have completed your Bio-Inventory of Mustique?

Do you have a report and/or checklist available? What's the status of your study?

I'll be on Mustique on the 24th conducting a bit of research of my own - let me know if I may be of any assistance, as I will hope to conduct an informal, general ecological survey.

Thanks! Matt Funk

[mayreau@caribsurf.com](mailto:mayreau@caribsurf.com) wrote:

Greetings to you too. I started out doing a "bio-inventory" but ended up doing a "Field Guide" with over 300 pages of photos and general information. When you arrive just ask for a copy of "\*/A Natural History of Mustique/\*". I would love to meet you and if possible be of some assistance to you. I live on the more southern Grenadine island of Mayreau but I still often 'run-away' to Mustique.

Regards,  
Mark.

On Mar 19, 2008, at 3:18 AM, Matt Funk wrote:

Excellent, they're already holding a copy for me! Wow, I only realized who you were after receiving your reply - I've been studying your work for the past several months!

Indeed, it would be really great to meet - I believe you may find that our common interests are heavily aligned! Over the past year I've developed an Economic Theory of Value based upon relative Insularity - and although most of those efforts have been directed toward Iceland, when I discovered the curious case of Mustique several months ago, I realized it served as a far more descriptive model for my solution than any island I've encountered to date. I've attached the Abstract for a current working paper, and the slides from a presentation I gave last week (no doubt you'll recognize some insights from your works!).

While on Mustique next week, I intend to develop a study which I may begin, but plan to conduct in earnest when I return in November. Generally speaking, I'm looking to assess the relative successes and failures (my preliminary research, as you will see from my two attachments, anticipates I may discover more successes than failures - but of course I realize how prone we are to error!) as they relate to the adherence to the development suggestions set forth in LLEWYN-DAVIES, WEEKS, FORESTIEK-WALKER & BOR, 1970. *Mustique: proposals for a development study*, unpublished. To date, however, I have not been able to obtain a copy of this original report. (Of course I would be very glad to hear if you knew where I might find one! I would also like to know who commissioned this report. Tennant? The Mustique Co.? I would also very much like to know your opinions regarding the most influential and effective custodian/s of Mustique's ecology?). Thus my research endeavours will most likely be based upon the details from Goldsmith's 1973 *The ecologist's role in development for tourism: a case study in the Caribbean* (which, I'm sure you're well aware, is a review of this 1970 report; if you haven't reviewed this, I'll forward it).

Naturally, I would be very grateful for any general insights you may have to offer, and of course would love to have a personal introduction to Mustique (and/or the Tabogo Cays)! Depending upon which day may be available, we may have an extra room for you and a guest (my wife and I are guests on this trip, but I understand the home at which we're staying is spacious; also, we're renting a house for a week in November and I would very gladly host a Mustique get-away then as well).

In any case, we'll be on Barbados the 22nd-24th (arriving this Saturday), then on to Mustique for a week late on the 24th. Are there any library and/or bookstore (UWI? CERMES?) resources I should explore while on Barbados? I have not yet procured a good topo map nor a nautical chart - would I find these on Barbados as well? Also, if you have any relevant papers which are not archived on the CERMES site (I have read your relevant works posted there), I would also be grateful for those. Any other suggestions? Also, has anyone surveyed the turtle populations on Mustique? Are there any parrots or other notable endemics?

Thanks again for your reply, Mark, I hope to meet you next week!

Sincerely...Matt Funk  
<Mustique Presentation March 08.pdf>  
<Value of Insularity.pdf>

Dear Matt,

Wow!!! This is serious stuff - and so wonderful to see that Mustique has captured someone like you in its attempt to protect its natural environment and to help make its tourism sustainable. First of all, you must know that I am a mere amateur naturalist with no biological training or expertise whatsoever. Because of my very general knowledge of our Grenadine islands, I have got my name attached to some papers and documents, but I am only a good observer - not a scientist of any sorts.

**I have never been able to locate that "LLEWYN-DAVIES" report and the only person that may be able to locate this is Mr. Brian Alexander of Mustique.** The CERMES library at UWI, Barbados is your best bet for locating documents on our Grenadine area - they also have a published Grenadine bibliography at their office there and may also have some relevant maps. I do have a small library at my place on Mayreau that you would be most welcome to use anytime. While in Barbados, please try to locate Prof. Julia Horrocks at the UWI, as she is the most knowledgeable person on the marine turtles of our area. Please find attached a recent paper where I give some background on our present Grenadine conservation situation - it may be of some interest to you.

I will try my best to come to Mustique next week (about Tuesday or Wednesday) to meet with you. Please contact Ms. Dianne Wilson of the Mustique Environmental Committee or Mr Ty xxxx (cant remember his full name), one of the managers of the Mustique Company, when

you arrive there. These two people would be your most relevant resource persons there. Thanks for your offer of accommodation but I always have a place to stay whenever I come to Mustique.

By the way, let me warn you that you are arriving in the midst of our dry season and the vegetation will be quite dry - very different from when you next visit in November.

Regards,  
Mark.

**Mark de Silva flew to Mustique to meet with me. He joined our party for a picnic lunch under a palapa on windswept Pasture Bay: fruit, mixed salads, home-made pizza slices, and a fine assortment of refreshments and French wines set on linen, china, silver, and crystal, and served with cheer by four members of the house staff. We had several hours of great conversation; Fr. de Silva imparted very interesting anecdotes, filled in some gaps in my research, and seems thoroughly interested in my endeavour, paying me a far greater compliment than I deserve by exclaiming that "he has been waiting all of his life for someone to tell my story!" He then lead us on an excellent tour of the lagoon, and kindly gave me two copies of his excellent new book: *The Spiders of St. Vincent & the Grenadines* (and I in turn gave one copy to my cousin Ben).**

----- Original Message -----

From: "Matt Funk" <matt@covehead.org>

To: <dianne@vincysurf.com>

Sent: Friday, March 21, 2008 10:48 PM

Subject: [Fwd: RE: Mustique]

> Hi Dianne!

>

> Both Father Mark and Robin Mahon suggested I might drop you a line to let

> you know I'm heading to Mustique in order to construct a research plan

> which I plan to conduct on a return trip after the rainy season in

> November. My research is rather unusual (and I've attached an abstract

> from a relevant working paper), but, in general, I'm interested in the

> relative health of all of the island's inhabitants - from the turtles to

> the people!

>

> I hope I'll have the opportunity to hear your thoughts on this matter!

>

> I'm a guest at Windwords next week (arriving from Barbados on Monday).

>

> Hope to meet you next week!

>

> Happy Easter!

>

> Matt Funk

**Subject:**Mustique

**Date:**Sat, 22 Mar 2008 09:10:25 -0400

**From:**Dianne Wilson <dianne@vincysurf.com>

**Reply-To:**Dianne Wilson <dianne@vincysurf.com>

**To:**Matt Funk <matt@covehead.org>

**References:**<47E4738F.1010303@covehead.org>

Matt;

I am sure you will enjoy Windwords tremendously. It is a beautiful property and Randall is a great host.

Further to your work, **I suggest that you contact the Mustique Company managing director Hon. Brian Alexander (whose father was the last British GG of Canada). It is best to contact Brian through Randall as he is a shareholder. You will want their cooperation, for sure.**

**As you so rightly point out, Mustique is quite unique in that it is an island developed and managed privately, but governed under the laws of St Vincent. The island is very private, and does is not comfortable with scrutiny, so you may find they are not enthusiastic. The island is a sanctuary for flora, fauna and celebrity.**

I am sure we will see each other at some point during your upcoming visit. Do let me know what the Mustique Company says, as without their openness, you will not have access to the data you need, and don't be surprised if they say no, you need to understand how Mustique has gained this success as a community where anonymity is a vital part of its success.

Best regards,  
Dianne Wilson

Subject: Sustainable Economic Development  
From: "Matt Funk" <mfunk@upe.ca>  
Date: Mon, 10 Mar 2008 12:01:49 -0300  
To: brian@mustique.vc

Greetings from the Institute of Island Studies. For the year I have been utilizing islands to model various problems and solutions relating to the significant problem of sustainable economic development, and, although much of my research has focused on the many positive attributes of Iceland, over the past several months Mustique has emerged as my primary model of the solution to this global problem. In the course of my research, I have developed an economic Theory of Value based on relative insularity which I believe you would find quite interesting. And, regarding Mustique in particular, I have reached a conclusion that (1) stringent land-use policy based upon a sound and thorough ecological development plan, and (2) your management of Mustique have been largely responsible for this sustainable development and pursuant success. I believe Mr Neumann (and, of course Mr Tenant's initial privatization of the island) may certainly be credited as well, but I would be very interested in hearing your thoughts on these and several other points. I will be coming to Mustique on the 24th (for one week) to conduct some field research, and if you have any time available I would be very grateful to discuss your island endeavours, struggles, and extraordinary accomplishments. I plan to spend most of the week taking stock of the island in regards to the original ecological development report Goldsmith (1973) outlined in "The Ecologist's Role in Development for Tourism: a Case Study in the Caribbean." If possible, I would also be very grateful to review a copy of LLEWELYN-DAVIES, WEEKS, FORESTIER-WALKER, BOR (1970) "Mustique: proposals for a development study," and/or any other documentation you believe might serve my research purposes well. I will be in Barbados for two days prior to my arrival on Mustique; if you are aware of any special library collections there, please advise. **Also, I am giving a seminar at The University of Prince Edward Island tomorrow entitled *On the Problem of Islandness: Lessons from Mustique*, and I am submitting a proposal to give another seminar at the Åland International Institute of Comparative Island Studies entitled *On the Problem of Connectivity: Branding Insularity - lessons from Mustique*.** Naturally, if you should have any interest, I would be happy to share any of my research and/or seminars with you and/or your board members. I look very forward to visiting Mustique later this month!

Sincerely...Matt Funk

> -----Original Message-----  
> From: Matt Funk [mailto:matt@covehead.org]  
> Sent: 18 March 2008 22:47  
> To: brian@mustique.vc

> Subject: [Fwd: RE: Mustique Presentation...]  
>  
> Greetings Brian....Not sure if you received my email last week, so I  
> wanted to follow up in hopes that we might be able to visit.  
>  
> I also thought perhaps you may be more inclined to visit with me if I  
> were able to paint a better picture of my research endeavour.  
>  
> I've attached a pdf copy of a presentation of my research on Mustique  
> (which I delivered here on PEI two weeks ago, and to which my cousin, Ben Funk, refers below).  
>  
> **It seems likely that you have had an extraordinarily positive impact**  
> **upon the development of Mustique, and I would like the opportunity to**  
> **document your contribution in my research.**  
>  
> Also, I have been waiting to hear back from your rental/sales department  
> regarding the availability of Fort Shandy for this November. I would  
> also be very keen to learn if the property is for sale. Otherwise, I  
> would also be interested in any property which demonstrates rental  
> cash-flow independence (if, that is, such a property should exist).  
>  
> If you and/or others would be interested in hearing my presentation  
> while I am on the island, I would be happy to do so.  
>  
> I'll call your office Thursday to see if you have the time or interest  
> in meeting with me next week.  
>  
> Sincerely...Matt Funk

> ----- Original Message -----  
> Subject: RE: Mustique Presentation...  
> Date: Tue, 18 Mar 2008 11:26:25 -0000  
> From: Ben Funk <bfunk@liongatecapital.com>  
> To: Matt Funk <matt@covehead.org>  
> References: <47DF9A3B.2000309@covehead.org>  
>  
> Love it...cant wait to show it to Randall...  
>  
> Ben Funk  
> Partner  
> Liongate Capital Management  
> Liongate House  
> 23 Great Pulteney Street  
> London W1F 9NH  
> United Kingdom  
> T: +44 (0)20 7534 3640  
> F: +44 (0)20 7534 3641  
> M: +44 (0)7973 525 911

Brian Alexander wrote:

> Matt,  
> No, I did not get your first email--hence my not replying to you.

> Thank you for sending a copy of your pdf presentation which I have read with interest.

> It is not clear from this email when you are going to be on the island and where you will be staying. I assume that next week is the dates you will be here. I would be happy for us to meet and, yes, please call the office tomorrow Thursday and speak to Cordelia who is my PA (I am in St Vincent all day tomorrow) and she can arrange a day and time and as you can see, I am copying her with this. I must point out that next week is my busiest week of committee and planning and Board meetings with the Directors and so we will have to work around those times. I have spoken to the villa rental department about Fort Shandy and they will get back to you about its availability in Nov. It is not for sale. When we meet I can show you the short list of properties for sale and discuss with you their rental prospects  
> Regards  
> Brian Alexander

-----Original Message-----

From: Matt Funk [mailto:matt@covehead.org]  
Sent: 21 March 2008 22:41  
To: Brian Alexander  
Subject: Re: [Fwd: RE: Mustique Presentation...]

Thank you for your reply and offer to get together with me, Brian. We leave for Barbados tomorrow, then on to Mustique on Monday. My cousin Ben and his wife, Zarina have graciously invited us to spend the week with them at Windwords. If you have time to come over for lunch, that would be great, otherwise perhaps we could meet somewhere for a bite or drink? In any case, I realize I'm catching you in the middle of your busy season, and I'd appreciate any time you might have available.

I'm sorry you didn't receive my previous email; I'll sketch an outline of my rather unusual research interest:

I'm conducting research at the Institute of Island Studies here on Prince Edward Island, and over the past year I've developed an Economic Theory of Value based upon relative Insularity - and although most of my efforts have been directed toward Iceland, when my cousin Ben brought Mustique to my attention several months ago, I realized it served as a far more descriptive model for my solution to *The Problem of Sustainable Economic Development* (which I endeavour to demonstrate is actually no different than *The Problem of Global Warming*, i.e. irrational resource consumption). You kindly reviewed the presentation slides I forwarded (and I imagine - out of context and without the corresponding dialogue - at best they may merely rather hazily outline my efforts). I've attached the Abstract for a current working paper which may also shed some light on my research.

While on Mustique, I hope to distil a general assessment and develop a

study which I may begin, but would like to conduct in earnest when I return in November. Generally speaking, I'm looking to assess the rather extra-ordinary, asymmetrical success Mustique has achieved through privatization, initial carrying-capacity assessments, strict land-use policies, a community of individual with relatively like-minded values, and prudent management (which is, of course, where I believe your efforts factor heavily in the equation) as they all relate to the adherence of the development plans outlined in LLEWYN-DAVIES, WEEKS, FORESTIEK- WALKER & BOR, 1970, *Mustique: proposals for a development study*. To date, I have not had the fortune of reviewing this report. If you are aware of a copy that I may be able to review, I would be extraordinarily grateful.

Thus my research objectives have been centred upon the only source of the early planning stage that I am aware of: Goldsmith's 1973 *The ecologist's role in development for tourism: a case study in the Caribbean*. (which, I'm sure you're well aware, is a review of the LLEWYN-DAVIES report; if by chance you're not familiar with this study, I'll attach it to this email as well.

Naturally, I would be also be very grateful for any general insights, direction, archives, or opinions you may have to offer.

Also, I should note that I've discovered that my central thesis seems rather controversial in some circles (for I have discovered that some individuals appear uncomfortable considering the possibility that individuals with relatively extraordinary means may offer a solution to global ecological degradation (and thus, in the long run, global poverty, as well). But I have also discovered that, for other individuals, Mustique helps simplify a powerful solution to what is perhaps one of the single greatest problems facing human civilization.

Thanks again Brian, I look forward to meeting and speaking with you next week.

Happy Easter...Matt Funk----- Original Message -----

**Subject:**RE: [Fwd: RE: Mustique Presentation...]

**Date:**Sat, 22 Mar 2008 11:17:27 -0400

**From:**Brian Alexander <brian@mustique.vc>

**To:**'Matt Funk' <matt@covehead.org>

Thanks for sending me the Abstract and the Goldsmith report which I had read, but many years ago.

**I have the Llewlin-Davies report and can give you a photocopy of it when you are here.**

I think the best is for you to call the office on Tuesday and then we can make an arrangement to meet. We will be in here from 8 am.

Yours truly, Brian Alexander



I met with the Hon. Brian Alexander at the Mustique Co. Office, and we engaged in an excellent two-hour conversation about the developmental history of Mustique, and Mr Alexander offered his insights regarding my research, which he had kindly, thoroughly reviewed. His secretary went off to photocopy the *original* development plan by hand, and returned with my copy just as we were wrapping up our conversation! Mr Alexander also gave me a parting gift: A fine copy of Billingham's 1804 Mustique map (cited in *The Mustique Development Plan* and Goldsmith 1973)! The Mustique Co. has a framed print of the same map on the wall just outside of Mr Alexander's office. Quite fortunately, I made it back to PEI with the plan and the map in perfect condition (the plan was never beyond arm's-reach during my entire trip home!).

I have detailed this brief snapshot of this discovery, intuitive hunch, and somewhat relentless pursuit within the context of my life-long pursuit of knowledge, and I might also add that, despite a recent contention that I was very “lucky” to procure this report, *I contend that what many refer to as luck is in reality the intersection of preparation and opportunity.*

Thus, below I offer a snapshot of the treasure I discovered on my first expedition to the admirable island Mustique, the first two pages of the 128 page, original, unpublished, 1970 *Mustique Development Plan*, which beautifully illustrates the essence of the entire report, and, most significantly, perhaps the single greatest planned execution of sustainable economic development. If you should have interest in reviewing this remarkable plan, you are all welcome to Stanhope, Prince Edward Island, for a guest-room for 3 nights (!), an Atlantic Lobster dinner, refreshments, a comfortable chair, and a good light under which to review the report, as I will respect the trust in which The Mustique Co. has generously endowed me with my present custodianship of their unpublished, private report.

In December 1970 the Mustique Company, sole owners of the Eastern Caribbean Island of Mustique, appointed the firm of Llewelyn-Davies Weeks Forestier-Walker & Bor to prepare a 20-year Development Plan for the island by May 1971. It was stressed that the study should concentrate on establishing the feasibility of low density high-income residential tourist development with small hotels both for the international and the local market. Proposals for immediate action were also required.

Within these wide terms of reference we have attempted to produce a Plan that is both a document showing existing and proposed use of land, and an instrument that embodies social, economic and ecological policies.

Despite the small size of the island a study of this kind involves consideration of most of the interacting components of a much larger system and similar or perhaps greater problems in making projections for future development.

We have felt therefore that the Plan should afford as much freedom as possible for the Mustique Company to respond to future opportunities, while at the same time providing policies that are firm and clear enough to guide development and to offer assurances to those investing.

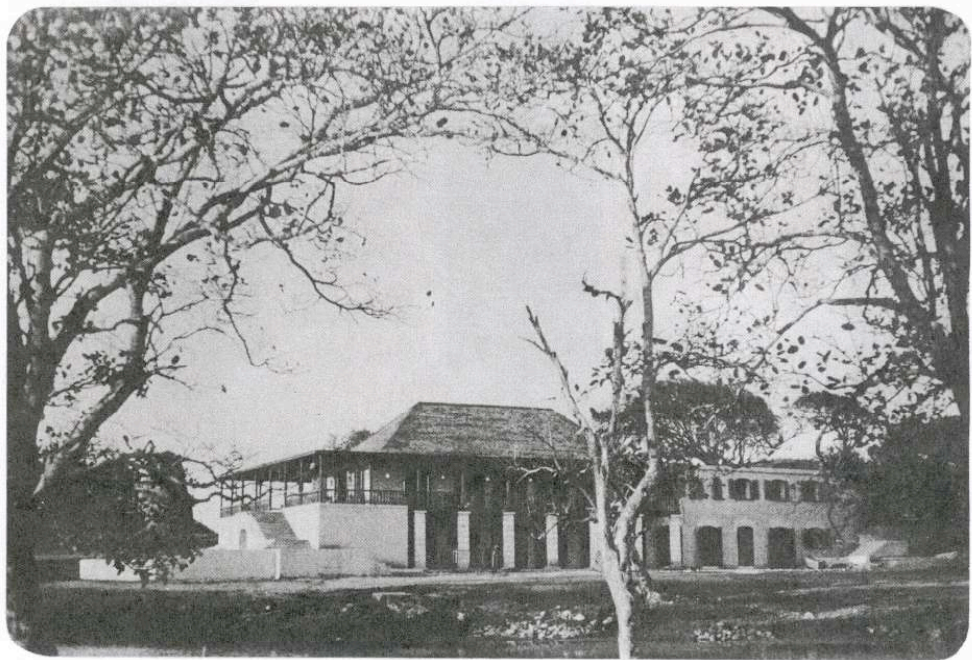


FIGURE 1: MUSTIQUE 1970 : THE COTTON HOUSE HOTEL

The development of Mustique involves the relationship of 3 groups of people: the Vincentians, the Visitors and the Mustique Company. The plan will need to assure potential investors that the proposals offer them the facilities they need within a context of reasonable long-term environmental and socio-economic stability.

This study has therefore attempted to identify the ecological and socio-economic constraints to development on the island and to make proposals that will offer a framework for maximising return on investment taking into account those constraints.

The goals of the plan have therefore been seen as:

- 1 To identify that sector of the potential regional market that will complement rather than compete with development elsewhere in the St Vincent Grenadines and provide suitable residential, recreational and service facilities on Mustique.
- 2 To minimise disturbance to the ecology of the island by achieving the most suitable relationships between proposed uses and the natural resources, and ensuring that the capacity of the island is not exceeded.
- 3 To maximise returns on capital invested by the Mustique Company within the constraints, ensuring that at each stage investments can be seen to be related to specific returns.
- 4 To adopt generally a policy of gradualism so that the effects of development can be carefully monitored; and in the short-term, to optimise the use of already existing and committed infrastructure.
- 5 To maximise the benefits accruing to the people of St Vincent from the development of Mustique.

## ABBREVIATIONS & DEFINITIONS

### Axiom

(a) "Fundamental Ideas"... are the sources of necessary truths (sometimes called "Axioms").<sup>1</sup>

(b) One states as axioms several properties that it would seem natural for the solution to have and then one discovers that the axioms actually determine the solution uniquely. The two approaches to the problem, via the negotiation model or via the axioms, are complementary; each helps to justify and clarify the other.<sup>2</sup>

Byr

### Billion Years

### Biogeography

(a) Biogeography is the study of the distribution and patterns of distribution of plants, animals and other organisms across the globe, on land, in the sea and in the air<sup>3</sup>

BIOGEOGRAPHY is the study of the facts and the patterns of species distribution. It's the science concerned with where animals are, where plants are, and where they are not. On the island of Madagascar, for instance, there once lived an ostrichlike creature that stood ten feet tall, weighed half a ton, it thumped across the landscape on a pair of elephantine legs. Yes, it was a bird. One thousand pounds of bone, flesh, feathers. This is no hypothetical monster, no implausible fantasy of Herodotus or Marco Polo. In a ramshackle museum in Antananarivo, I've seen its skeleton; I've seen its two-gallon egg. Palaeontologists know it as *Aepyomys maximus*. The species summed until Europeans reached Madagascar in the sixteenth century and began hunting it, harrying it, transforming the ecosystem as was part of, scrambling those bounteous eggs. A millennium ago, *Aepyomys maximus* existed only on that single island; now it exists nowhere. To say so is the business of biogeography. As practiced by thoughtful scientists, biogeography does more than ask *Which species?* and *To Where?* It also asks *Why?* and, what is sometimes even more crucial, *Why not?*<sup>4</sup>

### Consilience

(a) Of the two major methods for inferring history from single configurations, consilience calls upon a greater range of evidence. This word, coined by William Whewell in 1840, means "jumping together." By this term, Whewell referred to proof by coordination of so many otherwise unrelated consequences under a single causal explanation that no other organization of data seems conceivable. In a sense, consilience defines the larger method underlying all Darwin's inference from historical records. In a more specific context, I use consilience... for Darwin's principal tactic of bringing so many different points of evidence to bear on a single subject, that history wins assent as an explanation by overwhelming confirmation and unique coordination.<sup>5</sup>

### Cultural Evolution

It has been claimed that a meaningful theory of cultural evolution is not possible because human beliefs and behaviors do not follow predictable patterns. However, theoretical models of cultural transmission and observations of the development of societies suggest that patterns in cultural evolution do occur... We show that natural selection... slows the evolution of functional structures, whereas symbolic designs differentiate more rapidly. This finding indicates that cultural change, like genetic evolution, can follow theoretically derived patterns.<sup>6</sup>

### Ecology

In 1870, the German biologist Ernst Haeckel (1834-1919) first coined the term 'ecology' and defined it as 'the total relations of the animal both to its inorganic and organic environment'. In some ways that encapsulated what ecology is today; the study of the interactions between organisms and their environment.<sup>7</sup>

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1 Whewell 1837, reprinted in Butts 1968, p 5.

2 Nash 1953, p 129.

3 Spellerberg & Sawyer 1999, p xi.

4 Quammen 1996, p 2.

5 Gould 2002, p 104.

6 Rogers & Ehrlich 2008, p 3416.

7 Spellerman & Sawyer 1999, p 14.

## Equilibrium

(a) The notion of an equilibrium point... yields a generalization of the concept of the solution of a two-person...game. It turns out that the set of equilibrium points of a two-person...game is simply the set of all pairs of opposing "good strategies."<sup>1</sup>

(b) A Nash equilibrium is defined as a strategy combination with the property that every player's strategy is a *best reply* to the other players' strategies. This of course is true also for Nash equilibria in *mixed* strategies. But in the latter case, besides his mixed *equilibrium strategy*, each player will also have infinitely many *alternative* strategies that are his *best replies* to the other players' strategies. This will make such equilibria potentially unstable.<sup>2</sup>

## Evolutionary Game Theory

(a) Evolutionary theorizing has a long tradition in economics. Only recently has this approach been brought into the framework of noncooperative game theory. Evolutionary game theory studies the robustness of strategic behavior with respect to evolutionary forces in the context of games played many times in large populations of boundedly rational agents. This new strand in economic theory has... opened up doors to other social sciences.<sup>3</sup>

(b) Nowadays it almost seems to be obvious that the correct application of Darwinism to problems of social interaction among animals requires the use of non-cooperative game theory, but when this idea was first conceived it was a revolutionary great insight.<sup>4</sup>

## ESS

### Evolutionary Stable Strategy

Maynard Smith and Price (1973) introduced the concept of an evolutionarily stable strategy (ESS). Initially they were not aware of the relationship between the concept of an ESS and that of a Nash equilibrium. Rational game theory looked at mixed strategies as produced by conscious randomization. Nash's interpretation of a mixed equilibrium as a mass action phenomenon was buried in his unpublished dissertation and not found in textbooks on game theory. In biology the mass action interpretation is very natural and guided the work on evolutionary stability already from its beginning. In their original paper, Maynard Smith and Price (1973) restricted their attention to two person games in normal form. They defined an ESS as a strategy prescribed by a symmetric equilibrium point.<sup>5</sup>

### Funk-Zweikampf Solution

Our strategic solution is derived through the axiomatic application of our unified theory of value of the biological and social sciences,<sup>6</sup> generated through the discovery that *Value* ( $V$ ) is a derivative function of *relative insularity* ( $I_R$ ):  $V=f'(I_R)$ .

$I_R$  is formulated with the following variables: *Land Area* ( $km^2$ ), *Elevation* ( $m$ ), *Distance from nearest Continent* ( $km$ ), *Distance from nearest Neighbour* ( $km$ ), *Nearest Neighbour Land Area* ( $km^2$ ), *Renewable Water Resources* ( $m^3/person/year$ ), *Population Density* ( $p/km^2$ ), *Exclusive Economic Zone Area* ( $km^2$ ), *International Airports* ( $n$ ), *Deep Water Harbours* ( $n$ ), *Marine Links*, ( $n$ ) *Land Links* ( $n$ ), *Forests* ( $\% km^2$ ), *Commercial Agriculture* ( $\% km^2$ ), *Organic Agriculture* ( $\% km^2$ ), *Subsistence Agriculture* ( $\% km^2$ ), *Nature Preserve* ( $\% km^2$ ), *Tourist Visits* ( $p/yr$ ), *Irrigation* ( $m^3/person/year$  &  $\% km^2$ ), *Industrial Water Consumption* ( $m^3/person/year$ ), *Organic Water Pollutants* ( $grammes/p/day$ ), *Food Imports* ( $\%$ ), and the following four qualitative inputs: *Sovereign Status*, *Constitutional Balance*, *Cultural Homogeneity*, and *Military Power*. We calibrate our formulae by adjusting relative input weighting in accordance a positive, linear biogeographical correlation between  $I_R$  and the average human life expectancy for the corresponding politico-biogeographic area.

### Game Theory

(a) It is conventional to call these situations "games" when they are being studied from an abstract mathematical viewpoint. Here the original situation is reduced to a mathematical description, or model. In the abstract "game" formulation only the minimum quantity of information necessary for the solution is retained. What the actual alternative courses of action are among which the individuals must choose is not regarded as essential information. These alternatives are treated as abstract objects without special qualities and are called "strategies." Only the attitudes (like or dislike) of the two individuals towards the ultimate results of the use of the various possible opposing pairs of strategies are

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1 Nash 1950, p 286.

2 Harsanyi 1994, p 167.

3 Weibull 2002, abstract.

4 Selten 1994, p 168.

5 Selten 1994, p 168.

6 See APPENDIX I

considered (Nash 1953, 128).

(b) A game is non-cooperative if it is impossible for the players to communicate or collaborate in any way (Ibid, pp 128-129).

(c) Game theory is a theory of *strategic interaction*. That is to say, it is a theory of *rational behavior* in social situations in which each player has to choose his moves on the basis of what he thinks the other players' *countermoves* are likely to be.

After preliminary work by a number of other distinguished mathematicians and economists, game theory as a systematic theory started with von Neumann and Morgenstern's book, *Theory of Games and Economic Behavior*, published in 1944. One source of their theory was reflection on *games of strategy* such as chess and poker. But it was meant to help us in defining rational behavior also in *real-life* economic, political, and other social situations [all italics Harsanyi's 1994, p 136].

## GEMS

### Globalized Economic Military Superpowers

Presently, the United States of America represents the only true player in this arena, but our definition includes all five signatory members of the UK-USA agreement (UK, USA, Canada, Australia, and New Zealand), often referred to as AUSCANZUKUS, and six other nations which have developed, detonated, and presently maintain nuclear weapons (Russia, France, China, India, Pakistan, and North Korea). As noted below (RIS), however, GEMS status is not absolute.

### Guns Vrs. Organic

Guns versus Organic Butter model is our contemporary reformulation of the classic, antiquated production possibility frontier analogy, which models the national defence/civilian goods dilemma. Our model emphasized that, when RIS pursue rational development strategies, the dominant strategy is "Organic Butter" rather than simply "Butter." Organic butter is an agricultural and fisheries development strategies for sustaining and fostering (1) a pristine environment, (2) organic agricultural, (3) agriculture and fisheries independence, and (3) a sustainable and pure water table.

### Hyperbolic Discounting

It is well known from the literature that hyperbolically discounting agents tend to postpone actions into the future from an ex ante point of view, as declining discount rates imply a change of the relative weight of benefits and losses. It is also well known that naive agents tend to further procrastinate actions from an ex post point of view, as they are not aware of the time-inconsistency problem and that this outcome may be inefficient (e.g., Akerlof 1991, O'Donoghue and Rabin 1999). Yet, the interesting result derived from the exposition so far is that, no matter whether agents are sophisticated or naive, they will never invest in environmental protection if agent 1 does not invest (Winker 2006, p 13).

## I<sub>n</sub>/ i<sub>n</sub>

### Island

The foundation to our game theoretical approach to comparative island studies rests on the principles of set theory, and our primary island set includes all known planets capable of supporting human life. To date this set includes a single element, the island of Earth: {I<sub>1</sub>}. All biogeographical regions on Earth are distinguishable to various degrees of relative insularity, and thus, *all* regions on Earth – islands, continents, and oceans alike – make up the sub-set: {i<sub>1</sub>, i<sub>2</sub>, i<sub>3</sub>, ...i<sub>n</sub>}. Thus, the islands which make up the Earth are a subset Earth Island: {i<sub>1</sub>, i<sub>2</sub>, i<sub>3</sub>, ...i<sub>n</sub>} ⊆ {I<sub>1</sub>}. These sub-sets may be configured and analyzed by utilizing a wide-variety of biogeographical and political parameters.

### Learning

Learning from history does not come naturally to us humans... It is a platitude that children learn only from their own mistakes; they will cease to touch a burning stove only when they are themselves burned; no possible warning by other can lead to developing the smallest form of cautiousness. Adults, too, suffer from such a condition. This point has been examined by behavioural economics pioneers Daniel Kahneman and Amos Tversky... In some respects we do not learn from our own history. Several branches of research have been examining our inability to learn from our own reactions to past events: For example, people fail to learn that their emotional reactions to past experiences (positive or negative) were short-lived—yet they continuously retain the bias of thinking that the purchase of an object will bring long-lasting, possibly permanent happiness or that a setback will cause severe and prolonged distress (when in the past similar setbacks did not affect them for very long and the joy of the purchase was short-lived.<sup>1</sup>

## Myr

### Million Years

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1 Taleb 2001.

## Myths

Human events spring from passions, which generate systems of attendant *myths*. A man who has suffered some humiliation invents a theory that he is King of England, and develops all kinds of ingenious explanations of the fact that he is not treated with that respect which his exalted position demands. In this case, his delusion is one with which his neighbours do not sympathize, so they lock him up. But if, instead of asserting only his own greatness, he asserts the greatness of his nation or his class or his creed, he wins hosts of adherents, and becomes a political or religious leader, even if, to the impartial outsider, his views seem just as absurd as those found in asylums. In this way a collective insanity grows up, which follows laws very similar to those of individual insanity. Every one knows that it is dangerous to depute with a lunatic who thinks he is King of England; but as he is isolated, he can be overpowered. When a whole nation shares a delusion, its anger is of the same kind as that of an individual lunatic if its pretensions are disputed, but nothing short of war can compel it to submit to reason.<sup>1</sup>

## Politician

(a) The successful politician owes his power to the fact that he moves within the accepted framework of thought, that he thinks and talks conventionally. It would be almost a contradiction in terms for a politician to be a leader in the field of ideas. His task in a democracy is to find out what the opinions held by the largest number are, not to give currency to new opinions which may become the majority view in some distant future.<sup>2</sup>

(b) Politicians do not find any attractions in a view which does not lend itself to party declamation, and ordinary mortals prefer views which attribute misfortune to the machinations of their enemies. Consequently people fight for and against quite irrelevant measures, while the few who have a rational opinion are not listened to because they do not minister to any one's passions.<sup>3</sup>

## PEI

### Prince Edward Island

#### Prisoner's Dilemma

(a) Al Tucker was on leave at Stanford in the Spring of 1950 and, because of the shortage of offices, he was housed in the Psychology Department. One day a psychologist knocked on his door and asked what he was doing. Tucker replied: "I'm working on game theory.", and the psychologist asked if he would give a seminar on his work. For that seminar, Al Tucker invented the Prisoner's Dilemma as an example of game theory.<sup>4</sup>

(b) The Prisoner's Dilemma... is a game where two players have the option to cooperate or to defect. If both cooperate they receive the reward,  $R$ . If both defect they receive the punishment,  $P$ . If one cooperates and the other defects, then the cooperator receives the sucker's payoff,  $S$ , while the defector receives the temptation,  $T$ . The Prisoner's Dilemma is defined by the ranking  $T > R > P > S$ .

Would you cooperate or defect? Assuming the other person will cooperate it is better to defect, because  $T > R$ . Assuming the other person will defect it is better to defect, because  $P > S$ . Hence, no matter what the other person will do it is best to defect. If both players analyze the game in this rational way then they will end up defecting. The dilemma is that they both could have received a higher payoff if they had chosen to cooperate. But cooperation is irrational.<sup>5</sup>

(c) This "collective-risk social dilemma" exists in various social scenarios, the globally most challenging one being...climate change.<sup>6</sup>

#### Problem of Global Warming

Contrary to popular opinion, "*The Problem of Global Warming*," is not ecological distress due to the superheating of the Earth—because this is clearly not the problem—it is merely a single symptom of far more significant, inter-related problems, which stem from the *Problem of Induction*. In short, this problem is synonymous with *The Problem of Sustainable Economic Development*.<sup>7</sup>

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1 Italics mine, Russell 1928, pp 6-7.

2 Hayek 1982.

3 Russell 1928, p3.

4 Kuhn 1994, p 161. For A. W. Tucker's version, see APPENDIX IV: THE PRISONER'S DILEMMA.

5 Italics mine, May & McLean, 2007, p 8. Also see APPENDIX I, Cressman 1996, Hauert 2006, Weibull & Salomonsson 2006

6 Milinski et. al. 2008, p 2291.

7 Funk 2007a.

## Problem of Induction<sup>1</sup>

We submit *The Problem of Induction* may represent the most deeply entrenched and least understood problem on Earth, and it seems not much more about this problem may be usefully imparted without opening another four hundred page pandora's box; We regret the complexities surrounding this problem are too expansive to address in what is already a very long letter,<sup>2</sup> but the problem was first recognized by Hume (see Solution Part 1, below), and the solution was developed by Popper (see Part II). We've included numerous examples, which may help illuminate the pervasive nature of this problem in various contexts, especially in regards to Dasgupta's dubious claim to be a contributor in “these are early days in the *quantitative* study of sustainable development;”<sup>3</sup> because, since the time of Hume<sup>4</sup> and Cournot,<sup>5</sup> it has been self-evident that hope for a *quantitative* study of sustainable development is impossible without the aid of a time machine.

[Solution Part I:] Our foregoing method of reasoning will easily convince us, that *there can be no demonstrative arguments to prove, that those instances, of which we have had no experience, resemble those, of which we have had experience.*<sup>6</sup>

[Solution Part II:] According to a widely accepted view... the empirical sciences can be characterized by the fact that they use ‘inductive methods’, as they are called. According to this view, the logic of scientific discovery would be identical with inductive logic, i. e. with the logical analysis of these inductive methods. It is usual to call an inference ‘inductive’ if it passes from singular statements (sometimes also called ‘particular’ statements), such as accounts of the results of observations or experiments, to universal statements, such as hypotheses or theories. Now it is far from obvious, from a logical point of view, that we are justified in inferring universal statements from singular ones, no matter how numerous; for any conclusion drawn in this way may always turn out to be false: no matter how many instances of white swans we may have observed, this does not justify the conclusion that all swans are white.

The question whether inductive inferences are justified, or under what conditions, is known as the problem of induction. The problem of induction may also be formulated as the question of the validity or the truth of universal statements which are based on experience, such as the hypotheses and theoretical systems of the empirical sciences...

Scientific statements can only attain continuous degrees of probability whose unattainable upper and lower limits are truth and falsity’ [Reichenbach, Erkenntnis 1, 1930, p. 186]. At this stage I can disregard the fact that the believers in inductive logic entertain an idea of probability that I shall later reject as highly unsuitable for their own purposes. I can do so because the difficulties mentioned are not even touched by an appeal to probability. For if a certain degree of probability is to be assigned to statements based on inductive inference, then this will have to be justified by invoking a new principle of induction, appropriately modified. And this new principle in its turn will have to be justified, and so on.

Nothing is gained, moreover, if the principle of induction, in its turn, is taken not as ‘true’ but only as ‘probable’. In short, like every other form of inductive logic, the logic of probable inference, or ‘probability logic’, leads...to an infinite regress.<sup>7</sup>

(*exempli gratia*: a) It took a remarkably long time before the novelty of the intellectual situation was grasped. Few realized what had happened. David Hume...saw that a great step forward had been taken, but he did not understand just how great and how radical this advance in human knowledge really was. *I am afraid that even today many people still do not fully understand this.*<sup>8</sup>

(*exempli gratia*: b) *The classical notion of science as true, secure and sufficiently justified knowledge still flourishes even today. But it was overtaken sixty years ago by the Einsteinian Revolution; by Einstein’s gravitational theory.*

The outcome of this revolution is that Einstein’s theory, whether true or false, demonstrates that knowledge in the classical sense, secure knowledge, certainly is impossible. *Kant was right: our theories are free creations of our intellect, which we try to impose upon nature. But we are only rarely successful in guessing the truth; and we can never be certain whether we have succeeded. We must make do with conjectural knowledge.*<sup>9</sup>

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1 Also see Cournot 1838, Reichenbach 1930, 1966, Reichenbach et. al. 1971, Russell 1903, 1908, 1913, 1919, 1948, Ludwig et. al. 1993, and Wittgenstein 1969. Most works by Popper address this problem from various angles and within variable contexts.

2 Popper's 513 page treatise (1959) offers the best introduction.

3 2005, italics mine.

4 1739

5 1838

6 Italics mine, Hume 1739, Book I, Vol I, p 137.

7 Popper 1959, pp 31-35.

8 Italics mine, Popper 1994, p 36.

9 All italics mine, Popper 1994, p 37.



(exempli gratia: c) Hume has permanently influenced the development of the best of philosophers who came after him. *Man has an intense desire for assured knowledge. That is why Hume's clear message seemed crushing.*<sup>1</sup>

(exempli gratia: d) There is dangerous innocence in the expectation of a future formed on the basis of probability. Any accident to which a human has been subject, however rare, however distant in time, is a possibility we must ready ourselves for.<sup>2</sup>

(exempli gratia: e) The assumption that economists can find predictable solutions to economic problems is undoubtedly the most inhibiting force in... economics. It has led to the increasing isolation of theoretical economists from the day-to-day practitioners of the subject—the actual participants in an economy, the consumers and the producers.<sup>3</sup>

(exempli gratia: f) There is a problem in inference well-known as the problem of induction. It is a problem that has been haunting science for a long time, but hard science has not been as harmed by it as the social sciences, particularly economics, even more the branch of financial economics.<sup>4</sup>

(exempli gratia: g) Reared on Merton's and Scholes teachings of efficient markets, the professors actually believed that prices would go and go directly where the models said they should. The professors' conceit was to think that models could forecast limits of behavior. In fact, the models could tell them what was reasonable or what was predicable based on the past.<sup>5</sup>

(exempli gratia: h) Recall that I have waged a war against the charlatanism of some prominent financial economists for a long time. The points are as follows. One Harry Markowitz received something called the Nobel Memorial Prize in Economics...

What is his achievement? Creating an elaborate method of computing *future* uncertainty... An immediate result of Dr. Markowitz's theory was the near collapse of the financial system in the summer of 1998... by Long Term Capital Management ('LTCM'), a Greenwich, Connecticut, fund that had for principals two of Dr Markowitz's colleagues, 'Nobels' as well"...

Somehow they thought they could scientifically 'measure' their risks. They made absolutely no allowance in the LTCM episode for the possibility of their not understanding markets and their methods being wrong."<sup>6</sup>

(exempli gratia: i) Kant, in his Critique of Pure Reason, asserted under the influence of Hume that pure speculation or reason, whenever it ventures into a field in which it cannot possibly be checked by experience, is liable to get involved in contradictions or 'anti-anomies' and to produce what he unambiguously described as 'mere fancies' ; 'nonsense' ; 'illusions' ; 'a sterile dogmatism' ; and 'a superficial pretension to the knowledge of everything.'<sup>7</sup>

(exempli gratia: i) The indomitable force of nature was a fashionable nineteenth-century belief. The age was marked by tremendous optimism about science. The lesson gleaned from Charles Darwin, especially as interpreted by the tremendously influential British scientific philosopher Thomas Henry Huxley, was that nature was a marvellous and determined force that held the inevitable solutions to all of life's problems. Huxley was appointed to three British fishing commissions. He played a major role in an 1862 commission, which was to examine a complaint of driftnet herring fishermen, who said that longliners were responsible for their diminishing catches. The fishermen had asked for legislation restricting longlining. But Huxley's commission declared such complaints to be unscientific and prejudicial to more "productive modes of industry." The commission also established the tradition in government of ignoring the observations of fishermen. It reported that "fishermen, as a class, are exceedingly unobservant of anything about fish which is not absolutely forced upon them by their daily avocations."

At the 1883 International Fisheries Exhibition in London, which was attended by most of the great fishing nations of the world, Huxley delivered an address explaining why overfishing was an unscientific and erroneous fear: "Any tendency to over-fishing will meet with its natural check in the diminution of the supply,... this check will always come into operation long before anything like permanent exhaustion has occurred."...

For the next 100 years, Huxley's influence would be reflected in Canadian government policy. An 1885 report by L.Z. Joncas in the Canadian Ministry of Agriculture stated:

"The question here arises: Would not the Canadian fisheries soon be exhausted if they were worked on much

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1 Italics mine, Einstein 1956 p 21-22.

2 Botton 2000, p 90.

3 Hayek 1991, p 9.

4 Taleb 2004, p 117.

5 Lowenstein 2000, p 234.

6 Taleb 2001, pp 241-242.

7 Popper, 1945, vII, p38.

larger scale and would it be wise to sink a larger amount of capital in their improvement?

...As to those fishes which, like cod, mackerel, herring, etc. are the most important of our sea fishes, which form the largest quota of our fish exports and are generally called commercial fishes—with going so far as to pretend that protection would be useless to them—I say it is impossible, not merely to exhaust them, but even noticeably to lessen their number... *For the last three hundred years fishing has gone on in the Gulf of St. Lawrence and along the coast of our Maritime Provinces, and although enormous quantities of fish have been caught, there are no indications of exhaustion.*"<sup>1</sup>

Only a decade after reassuring the Canadians and the world that the waters around Great Britain “show no sign of exhaustion,” such a thing being scientifically impossible, the British discovered that the cod stocks in the North Sea had been depleted.<sup>2</sup>

(exempli gratia: j) We shall never attain scientific consensus concerning the systems that are being exploited. There have been a number of spectacular failures to exploit resources sustainably, but to date there is no agreement about the causes of these failures....

The great difficulty in achieving consensus concerning past events and a fortiori in prediction of future events is that controlled and replicated experiments are impossible to perform in large-scale systems. Therefore there is ample scope for differing interpretations. There are great obstacles to any sort of experimental approach to management because experiments involve reduction in yield (at least for the short term) without any guarantee of increased yields in the future. Even in the case of Pacific salmon stocks that have been extensively monitored for many years, one cannot assert with any confidence that present levels of exploitation are anywhere near optimal because the requisite experiments would involve short-term losses for the industry....

Scientific certainty and consensus in itself would not prevent overexploitation and destruction of resources. Many practices continue even in cases where there is abundant scientific evidence that they are ultimately destructive. An outstanding example is the use of irrigation in arid lands. Approximately 3000 years ago in Sumer, the once highly productive wheat crop had to be replaced by barley because barley was more salt-resistant. The salty soil was the result of irrigation. E. W. Hilgard pointed out in 1899 that the consequences of planned irrigation in California would be similar. His warnings were not heeded. Thus 3,000 years of experience and a good scientific understanding of the phenomena, their causes, and the appropriate prophylactic measures are not sufficient to prevent the misuse and consequent destruction of resources....

Once we free ourselves from the illusion that science or technology (if lavishly funded) can provide a solution to resource or conservation problems, appropriate action becomes possible. Effective policies are possible under conditions of uncertainty, but they must take uncertainty into account.<sup>3</sup>

(exempli gratia: k) ‘In cases of uncertainty, economic reasoning will be of little value’ (Lucas, 1981, P 224).... In the case of uncertainty no such probability distribution is possible and in consequence, to quote two of economics most eminent practitioners ‘no theory can be formulated in this case’ (Arrow, 1951 p. 417) and again ‘In cases of uncertainty, economic reasoning will be of little value’ (Lucas, 1981, P 224). But human beings do construct theories all the time in conditions of pure uncertainty—and indeed act on them and sometimes die for them.... Therefore the central questions that confront economists in cognitive science are not only how human beings learn and meld beliefs and preferences to reach decisions and hence the choices that underlie economic theory but also how and why do they develop theories in the face of pure uncertainty.<sup>4</sup>

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1 Italics mine, Kurlansky, 1997, pp 121-123.

2 Ibid, p 144.

3 Ludwig et. al. 1993.

4 North, no date, p 2.

## Problem Solving

Men, animals, plants, even unicellular organisms are constantly active. They are trying to improve their situation, or at least to avoid its deterioration. Even when asleep, the organism is actively maintaining the state of sleep: the depth (or else the shallowness) of sleep is a condition actively created by the organism, which sustains sleep (or else keeps the organism on the alert). Every organism is constantly preoccupied with the task of solving problems. These problems arise from its own assessments of its condition and of its environment; conditions which the organism seeks to improve.

An attempted solution often proves to be misguided, in that it makes things worse. Then follow further attempts at solution – further trial and error movements.

We can see that life—even at the level of the unicellular organism—brings something completely new into the world, something that did not previously exist: problems and active attempts to solve them; assessments, values: trial and error.

It may be supposed that, under the influence of Darwin's natural selection, it is the most active problem solvers, the seekers and the finders, the discoverers of new worlds and new forms of life, that undergo the greatest development.

Each organism also strives to stabilize its internal conditions of life and to maintain its individuality – an activity whose results biologists call 'homoeostasis'. Yet this too is an internal agitation, an internal activity: an activity that attempts to restrict the internal agitation, a feedback mechanism, a correction of errors. The homoeostasis must be incomplete. It must restrict itself. Were it completely successful, it would mean the death of the organism, or, at the very least, the temporary cessation of all its vital functions. Activity, agitation, search are essential for life, for perpetual restlessness, perpetual imperfection; for perpetual seeking, hoping, evaluation, finding, discovering, improving, for learning and for the creation of values; but also for perpetual error...

*Darwinism teaches that organisms become adapted to the environment through natural selection. And it teaches that they are passive throughout this process. But it seems to me far more important to stress that the organisms find, invent and reorganize new environments in the course of their search for a better world...*

All organisms are fully occupied with problem-solving. *Their first problem is survival.* But there are countless concrete problems that arise in the most diverse situations. And one of the most important problems is the search for better living conditions: for greater freedom; for a better world.

According to this optimistic interpretation, it is through natural selection and (we may suppose) through an external selection pressure that a strong internal selection pressure comes into being at a very early stage; a selection pressure exerted by the organisms upon their environment. This selection pressure manifests itself as a kind of behavior that we may interpret as searching for a new ecological niche. Sometimes it is even the construction of a new ecological niche.

This pressure from within results in a choice of niches; that is, in forms of behavior that may be regarded as a choice of lifestyles and of surrounding. This must be taken to include choice of friends, symbiosis, and above all, perhaps most importantly... the choice of a mate...<sup>1</sup>

## R&D Research & Development

### RIS Relatively Insular States

This category includes sovereign island nations, sub-national island jurisdictions, insular provinces (i.e. Newfoundland & Labrador), states (i.e. Hawaii), municipalities (i.e. Vancouver Island), and relatively insular jurisdictions (i.e. The Alpine Convention region) Given relative insularity (see Axiom VII), we divide geopolitical regions into (1) RIS and (2) GEMS, but in reality, naturally, the true relative insularity of each region lies along a sliding scale with a true GEMS at one end (the United States) and a true RIS, such as the big island of Hawaii at the other.

### Social Norms

The existence of social norms is one of the big unsolved problems in social cognitive science. Although no other concept is invoked more frequently in the social sciences, we still know little about how social norms are formed, the forces determining their content, and the cognitive and emotional requirements that enable species to establish and enforce social norms....

Human societies represent a spectacular outlier with respect to all other animal species because they are based on large-scale cooperation among genetically unrelated individuals. In most animal societies, cooperation is either orders of magnitude less developed compared with humans, or it is based on substantial genetic relatedness.<sup>2</sup>

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1 All italics mine, Popper 1992.

2 Fehr & Fischbacher 2004, p 1.

## Strategic Equilibrium

What do I mean by “strategic equilibrium”? Very roughly, the players in a game are said to be in *strategic equilibrium* (or simply *equilibrium*) when their play is *mutually optimal*: when the actions and plans of each player are rational in the given strategic environment – i.e., when each knows the actions and plans of the others. For formulating and developing the concept of strategic equilibrium, John Nash was awarded the 1994 Prize in Economics Sciences in Memory of Alfred Nobel, on the fiftieth anniversary of the publication of John von Neumann and Oskar Morgenstern’s *Theory of Games and Economic Behavior*. Sharing that Prize were John Harsanyi, for formulating and developing the concept of *Bayesian equilibrium*, i.e., strategic equilibrium in games of incomplete information; and Reinhard Selten, for formulating and developing the concept of *perfect equilibrium*, a refinement of Nash’s concept, on which we will say more below. Along with the concepts of *correlated equilibrium* (Aumann 1974, 1987), and *strong equilibrium* (Aumann 1959), both of which were cited in the 2005 Prize announcement, the above three fundamental concepts constitute the theoretical cornerstones of noncooperative game theory [all italics Aumann’s 2005, p 352].

## Struggle for Life

(a) Nothing is easier than to admit in words the truth of the universal *Struggle for Life*, or more difficult--at least I have found it so--than constantly to bear this conclusion in mind. Yet unless it be thoroughly engrained in the mind, I am convinced that the whole economy of nature, with every fact on distribution, rarity, abundance, extinction, and variation, will be dimly seen or quite misunderstood. We behold the face of nature bright with gladness, we often see superabundance of food; we do not see, or we forget, that the birds which are idly singing round us mostly live on insects or seeds, and are thus constantly destroying life; or we forget how largely these songsters, or their eggs, or their nestlings, are destroyed by birds and beasts of prey; we do not always bear in mind, that though food may be now superabundant, it is not so at all seasons of each recurring year.<sup>1</sup>

(b) Our objective here is not to come up with a ponderous definition of war, but rather to grasp its essence: *Zweikampf*:<sup>2</sup> *The Struggle for Life*. War is actually nothing but a series of *Struggles for Life*. It may be most helpful to think of the innumerable struggles that make up war as a single unit, to imagine two wrestlers locked in a hold, each struggling to impose his will, to attack, to defend against counter-attack, to render his opponent incapable or further resistance, and, both generally and ultimately, to survive the *Struggle for Life*.<sup>3</sup>

## Theory of Value

(a) As a man’s judgement about value, so, in the last resort, must his judgement about economics. Value is the essence of things in economics. Its laws are to political economy what the law of gravity is to mechanics. Every great system of political economy up till now has formulated its own peculiar view on value as the ultimate foundation in theory of its applications to practical life, and no new effort at reform can have laid an adequate foundation for these applications if it cannot support them on a new and more perfect theory of value.<sup>4</sup>

(b) As early as Aristotle we find an attempt to discover a measure of the use value of goods and to represent use value as the foundation of exchange value. In the *Ethica Nicomachea* (v. 5. 1133a, 26–1133b, 10) he says that “*there must be something that can be the measure of all goods. . . . This measure is, in reality, nothing other than need, which compares all goods. For if men desire nothing or if they desire all goods in the same way, there would be no trade in goods.*”<sup>5</sup>

(c) In economics the most fundamental of these central problems is the theory of value. The theory of value must explain how the comparative values of different goods and services are established. Until that problem is solved, it is not possible to analyse for scientific purposes what will be produced and in what quantities, how the resources will be employed in producing the menu of outputs, and how the resources will be valued. Without a theory of value the economist can have no theory of international trade nor possibly a theory of money. This central problem of value does not change in its

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1 Darwin 1859, p 62.

2 The essence of war is a violent struggle between two hostile, independent, and irreconcilable wills, each trying to impose itself on the other. War is fundamentally an interactive social process. Clausewitz called it a *Zweikampf* [*The Struggle for Life*]...and suggested the image of a pair of wrestlers locked in a hold, each exerting force and counterforce to try to throw the other. War is thus a process of continuous mutual adaptation, of give and take, move and countermove (Gray 1997).

3 Clausewitz 1832, p 1. The author would like to thank Simone Stahel-Webster for her assistance with this English translation; naturally, any errors or omissions may be attributed singularly to the author.

4 Wieser 1893, p xxx.

5 Italics mine, Menger 1871.

essential content if one seeks to explain values in rural or urban societies, or in agricultural or industrial societies. Indeed, if the problem of value were so chameleon like as to alter its nature whenever the economic or political system altered, each epoch in economic life would require its own theory, and short epochs would get short-lived theories.<sup>1</sup>

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<sup>1</sup> Stigler 1982, p 61.

## SELECTED BIBLIOGRAPHY

Since the heavily annotated, selected bibliography for this three-segment discourse is longer than this paper itself, includes a many high resolution photographs, I have submitted this file under separate cover, and will bring a few printed copies for anyone who might be interested in referring to titles cited herewith. If you would like a pdf copy of this bibliography and/or the second and third papers in this discourse, please email you request.

Thank you!<sup>1</sup>

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<sup>1</sup> All comments, criticisms, corrections, and questions will be gratefully accepted and carefully considered.

Thank you!