ENVIRONMENTAL ETHICS
AND THE OYSTER OF THE CHESAPEAKE BAY

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(ABSTRACT)

One of the primary concerns of science studies scholars is the translation and utilization of theory in practice. In this thesis, I address this concern as it applies to theories of environmental ethics by analyzing the present use in and the applicability of Green philosophy to a current environmental public policy debate. Namely, through a history and analysis of the debate over the proposed introduction of a foreign species of oyster to the Chesapeake Bay, I show that the Green perspective can, if adopted, be a valuable aid to solving current environmental problems.
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Introduction

In recent decades, a sizable and increasingly influential environmental movement has become prominent. Centered around the science of ecology and focused on the preservation of Nature\(^1\), the environmental movement is a twentieth-century phenomenon. Although the movement did not begin to be widely influential until the establishment of various environmental groups in the 1960's, several authors in the first half of the century laid its foundations by introducing and defending the notion that present human civilization and patterns of human interference in Nature were destroying the environment, a process which would eventually lead to the destruction of the human species as well. Aldo Leopold, writing in the 1930's, was one of these writers. He was both one of the first to write on these topics and his works are still an influence on contemporary environmentalists. Another author to whom contemporary environmentalists turn is Rachel Carson, who published *Silent Spring* in 1962. Most of these authors were not philosophically or scientifically rigorous, although they all had in

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\(^1\) I will be capitalizing "Nature" throughout this thesis in order to accentuate the importance of its role in both the Green perspective and the Chesapeake Bay oyster debate.
common a crucial appeal to the science of ecology for their thoughts, their warnings, and their evidence.

As the environmental movement has grown and become a political force since the 1960's, two branches have diverged. Greens today characterize them as the reformist movement and the Green movement. Both, Greens contend, act in response to the abuses of Nature by modern Western civilization and both work to change the current situation. Their approaches, however, are radically different. In short, reformists attempt to change the pattern of abuse by working within the present system. Reformists accept the system as it is, believing that an attempt to change the system would likely be unsuccessful, and even in the event that it were successful, such a change would take too long to effect. The present environmental problems are severe, and, reformists believe, action is needed now to curb the devastation; action taken only once the system has changed would be far too late. Many reformists, furthermore, feel there is no reason to change the system; in their view the present system is capable of handling environmental issues responsibly and effectively. Reformists' publications, then, are mainly pamphlets and news items on present abuses of Nature. Their work revolves around what environmental problems currently exist, what should be done, what is being done, and what citizens can do to help.
Greens have rejected this reformist approach as futile, feeling that it is analogous to taking one step forward for every two steps back. Instead, Greens concern themselves not only with political action, but with philosophical orientation. They advocate the adoption of an alternative world view, with differing political systems, societal structures, and ways of relating with Nature through these structures. Conceptually, their alternative differs from what they consider to be the mainstream, "dominant" world view in that it is non-anthropocentric, holistic, and emphasizes human community and human harmony with Nature. While Greens write extensively on both their vision of a new belief system and what they criticize in the contemporary "dominant" world view, they are at the same time consciously andconcertedly politically active, and they produce literature on regional environmental problems as do reformists in an effort to inform and encourage involvement from concerned citizens.

Whether or not Greens are or can be more successful than reformists has yet to be determined, and their path to such success is certainly besieged with obstacles. Since Greens argue from a perspective which contradicts and vehemently opposes that of traditional entrenched political bodies, the road Greens travel in convincing such policy makers to make environmentally conscious decisions is very difficult. Green arguments are often not considered viable, and, in some cases they are not considered at all. As a result, in trying to accomplish political objectives now, before the Green world view
is recognized as a legitimate alternative, Greens walk a fine line between their desire to accomplish their goals within the present system and sacrificing their beliefs in the attempt.

It is not immediately obvious how Green theories of Nature are influential in on-going debates, nor is it clear whether these theories are able to contribute constructively to such debates. Although elusive, these concerns are crucial to an assessment of the efficacy of Green philosophy, and in this thesis I endeavor to illustrate that Green theories of Nature can, if utilized, contribute analyses and recommendations to the solution of current environmental policy problems which would otherwise be overlooked.

More specifically, I have studied a debate which is now raging in the Chesapeake Bay area. In the last thirty years, the oyster population of the Bay has suffered dramatic losses, and as the oyster has suffered, so has the oyster industry. As industry representatives have clamored for help, scientists and policy makers have sought solutions to the problem but have nonetheless been unable to curb the devastation through policy changes or scientific advances. The most prominent environmental group of the region, the Chesapeake Bay Foundation, has since entered the fray, and they have advised policy makers and industry representatives to view the problem as primarily ecological in nature, making the economic concern
secondary, because if the oyster is saved, the industry will probably survive as well whereas if the oysters cease to exist, the total collapse of the oyster industry is guaranteed. Interestingly, none of these interest groups claim to be Green or even environmentalists. Even the Chesapeake Bay Foundation (the CBF) makes a clear distinction between itself and environmentalists in public statements and in private interviews, most likely because of the decreased effectiveness of groups with that label in public policy forums.

Since 1989 the debate has intensified because at this time two scientists at the Virginia Institute of Marine Science proposed a highly contentious solution. In their view, the population of native oyster, *Crassostrea virginica*, might never rebound from the stress of two uncontrollable and deadly diseases, and therefore the best and most reasonable solution would be to introduce a foreign species of oyster which was proven to be resistant to these diseases. The oyster they proposed to test for resistance was a Japanese oyster called *Crassastrea gigas*.

The proposal was initially rejected because it required testing the oyster in bay waters, which would risk a full-scale introduction of the organism before they knew the potential resistance and problems which could result from such an introduction. The debate over this proposal, however, has continued, and as participants have
aligned themselves and have established arguments for and against the testing and the introduction, two inextricably linked areas of concern have emerged: the ecological and the economic. Generally speaking, industry and governmental policy-making bodies are mainly concerned with the economic problems associated with the debate, although policy makers are also concerned with the ecological effects an introduction of a foreign species would have as well, because of the traditional and symbolic value citizens of the states of Maryland and Virginia attribute to the Bay. The CBF (Chesapeake Bay Foundation), as I have stated, wishes to see the ecological issues become the primary focus of the debate, and most scientists agree because of the inextricable nature of the concerns.

One of the most contentious issues, then, is whether the oyster itself is important primarily for its ecological or economic value; the two common slogans of the debate have been "save the oyster" and "save the watermen [those who harvest the oyster]". All participants agree that ecologically, the Bay would be irreparably damaged if the oyster were to disappear and that economically, the oyster industry, as well as the traditional and almost mythical occupation of watermen, has no chance of survival without a rebound in the oyster population. The actual economic value of this industry, however, is not agreed upon and is questioned by many because it is not clear that the amount of money and the number of jobs which the citizens of the states of Maryland and Virginia receive is enough to
warrant the amount of time and money spent by the states in efforts to preserve and maintain the industry.

Such questioning of the economic value of the oyster industry is unthinkable to most of the participants in the debate, because of the traditional and the symbolic significance participants grant both the oyster industry and the oyster. Traditionally, the oyster has been viewed as a symbol of the Bay, as an entity which represented the bounty and richness of the Bay. As the oyster becomes less plentiful, however, it is slowly being replaced in this role by the Blue Crab. This traditional and symbolic importance is an intrinsic value, and here it is being attributed, albeit weakly, to the oyster. Through its traditional importance, the Bay as a whole is also granted intrinsic value, and this value is strong, unchanged. The majority of debate participants believe that the Bay has value in and of itself.

The main insight that the Green perspective lends this debate concerns the tripartite distinction present in the views of the participants. There is the ecological value of the oyster to the Bay, the economic value of both the oyster to the industry and the Bay to all of the bay seafood industries, and there is the intrinsic value weakly granted to the oyster and strongly to the Bay. These values exist simultaneously, and participants often fail to differentiate

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2 A few scientists are the only exceptions.
between them. This is especially true of the intrinsic value attributed to the Bay.

Participants not only value the Bay, the oyster, and the industry in these three ways, they also use it as a basis for assessing their responsibilities. They feel that they have a responsibility to protect the oyster, the Bay, the industries, and the traditions and mythic significance attributed to them. The conflict between these three sets of duties and the absence of any clear way to rank them is the crux of the debate. Policy makers feel torn between the seemingly opposing, divergent responsibilities they have, and other participants argue as well over which should have priority. In finding a swift, long-range solution to the problems, however, participants would do well to adopt the Green belief in human harmony with Nature, by which they would then view these three areas of responsibility as co-operative efforts rather than competitive. In other words, the ecological, economic, and traditional concerns are not separate and distinct issues in any sense, and participants’ sense of responsibility, and their resulting action, should reflect this. Industry concerns should not be viewed as opposing ecological concerns, and traditional concerns should not be seen as frustrating the path to a resolution.

Such co-operation is one of the main thrusts of the Green belief system, and as such, I show that Green philosophy can be a
significant and useful alternative perspective for people to consider when approaching environmental problems.
Chapter 1 -- Environmental Philosophy

In this first chapter, I establish the relevant philosophical bases of the Green perspective. The first section describes the "dominant" world view as it is defined and reacted to by Greens. The second section presents the Greens' view of reformist environmentalism; it is a summary of the largely political reformist response to both environmental abuses and governmental lack of action towards curtailing these abuses. These two sections provide the context within which Greens place their own approach, which is the subject of section three.

1. The Green Critique of the Dominant World view

Greens define a world view as the collection of norms, beliefs, and values which are commonly held as true, and are passed on from generation to generation by social institutions. A world view is the frame of reference to which a collectivity of people appeal in answering questions and solving problems in their daily lives. This includes general assumptions about reality, general "rules of the game" for approaching problems, a definition of the assumptions and

goals of their society, and a confidence in the ability of this framework to elicit solutions to problems.\textsuperscript{4} In this sense this conception is reminiscent of one of the ways in which Thomas Kuhn uses the word "paradigm", and indeed, some writers prefer to call this dominant world view a dominant social paradigm, often using the two words interchangeably.

Although limited space curtails any in-depth discussion of this definition, it is important to note that even if one accepts the definition, finding evidence of a 'dominant world view' in an actual population is difficult. Evidence appears not in what people say; rather, it appears in how they say it, and it appears not in what solutions they might suggest to a problem, but in which solutions they consider viable and realistic and which they do not. And evidence also appears in people's actions. For example, animal rights activists often feel they are marginalized by policy makers in public policy forums, because policy makers consider many of the activists' arguments, such as that all species have "intrinsic value" and should be treated accordingly, to be invalid or unrealistic. Activists contend that in these forums, their concerns are often excluded because of the obstinacy of those whose views of nature prevail. If activists say that they believe an animal should be allowed to keep its natural habitat intact simply because it is a living creature, deserving life in its own right, and because it is a

part of the ecosystem of that area, they are liable to be labeled "sentimental, irrational, or unrealistic". Such labels, especially when they are unquestioned and assumed by the majority of the population or even by the dominant socio-political structure, are clear indicators of the dominant world view as it is acted upon by its subscribers, whom I will call traditionalists.

Such clashes are what George Sessions, in *Deep Ecology*, points to as one of the main reasons that many environmentalists now actively strive to change the system rather than simply work within it. It is also through such experiences as those of animal rights activists that Green environmental ethicists formed a characterization of this system, this dominant world view.

One of this world view's primary elements is a sharp separation of human beings from Nature, in that traditionalists consider the concerns and characteristics of the human realm to be distinct from those of the non-human realm. For instance, traditionalists would approach debates over the development of wetlands as an issue of competing and separate interests: that of the wetland, which will lose habitat for its inhabitants, thereby risking the loss of species to extinction, and that of humans, who need places to live. Traditionalists do not view themselves as losers when wetlands and

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5 Sessions & Devall, pg. 3.  
6 Sessions & Devall, pg. 43.
other ecosystems are destroyed; they do not see themselves as active participants in those ecosystems.

Another notion attributed to the dominant world view, one which is linked to the element of separation, is anthropocentrism; namely, a sense of the absolute superiority of humans over Nature. It is "the conceited notion that man, or human reason, . . . is the center and pivot of the universe".7 The concerns of human beings, therefore, are not only separate from those of Nature, but are superior to those concerns as well. Furthermore, all things which have value are those things which are made by, controlled by, or useful to humans. Nature has no intrinsic value, and therefore Nature is a resource which is important only insofar as it is available for human use.

Nature's role in this process of exploitation is that of a passive participant to the activities of humans. Nature, then, is not a living, active entity; it is mechanical, dead. To traditionalists Nature has no independent life in the sense that human beings do (this has been debated with a few individual species, but rarely very successfully and never for the whole of Nature). Nature "in itself is basically a self-sufficient, self-enclosed complex of merely physical forces acting on colorless, tasteless, and odorless particles of hard, dead matter".8 The science of physics gives this definition to the

7 Santayana, from Sessions & Devall, pg. 47.
dominant world view, specifically through Newton's three laws of nature which describe Nature in terms of forces and masses of dead, passive, physical matter. Such a conception does not lead one to feel sympathetic towards Nature, because if Nature is dead hard matter, then such effusion is unnecessary; an argument that explains the frequent characterization of Greens as "sentimental, irrational, or unrealistic" when they assume or argue for a living view of Nature.

Traditionalists believe that promotion of sciences such as physics accomplishes the domination of Nature through the production of knowledge, which in turn leads to a better world for humans. The domination of Nature, then, stems from scientific, dispassionate learning and knowledge and is also exemplified by so-called "hard" sciences such as physics and chemistry. It is through the knowledge of science that domination is possible, and it is through technology that domination is achieved. As humans dominate more and more of Nature, they are, then, also making progress in the traditionalist view, and such progress is a requirement of civilization, it is a needed, mandatory state. Greens criticize the high status afforded to "hard" science, but some non-Green critics of the dominant world view believe that physics does not need to be devalued in this way. These critics believe that physics itself, as it

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9 It should be noted here that physics has often been hailed (or lamented) as the dominant and most important science of the twentieth century.
10 Engel, pg. 72.
is newly expressed through relativity theory and quantum mechanics, can provide humanity with a new way of being, with a new world view, which is not destructive and unhealthy. For Greens, however, the problem with this view is that even if the New Physics, as it is called, does lead to the "reenchantment of the world", it does not include the notion that the Earth itself has value in and of itself, distinct from the value it has relative to human beings. The view which comes from the New Physics is still essentially anthropocentric and mechanistic. As such, Greens also criticize these "New Physicists", although Greens do turn to them in analyses of the dominant world view.

Greens believe, however, that this human domination of Nature has led to an increasingly artificial environment in that it is created by and to human specifications, making for a humanly created but ultimately destructive environment for both humans and Nature. Furthermore, in this process, science and technology have replaced Nature not only as a source of marvels and power, but as a source of human contentment and continual, growing happiness. This progressively destructive environment necessarily comes at the expense of Nature, but because Nature is outside the realm of human

11 See Berman, The Reenchantment of the World
12 Such as to Fritjof Capra's The Turning Point and Morris Berman's The Reenchantment of the World.
13 Sessions & Devall, pg. 48.
beings, that is, separate from humans, and dead, it is no matter to traditionalists (a position Greens vehemently oppose).

William Leiss, in *The Domination of Nature*, claims that, by means of the same science and technology, the desire to conquer Nature leads to the inevitable domination of not only Nature but also of human beings.\(^{15}\) Traditionalists, then, hold that the perfection of human society comes in its adherence to science intellectually and ideologically. In other words, if humans were to adopt "scientific" values such as disinterestness and progress in their social interactions, then social interactions, and thereby society, would be much more organized, peaceful, and contented. Nations would no longer war, poverty would be obliterated.\(^{16}\)

Greens object to this reasoning, believing that such a claim, that the betterment of humans comes via science and technology, via the control of humans by their own scientific knowledge, is an insidious one to any who value their liberty and freedom of thought and action.

Another problem Greens cite in this view is that at the same time that traditionalists say that humans are different and superior to Nature, they assume that humans resemble machines as they believe Nature does; thus they provide a scientific basis for their

\(^{15}\) Leiss, pg. 15-16.

\(^{16}\) Leiss, pg. 79.
assumption that humans and Nature are machines, but they leave unsupported their assumption that humans are superior to Nature.

II. The Reformist Response

Alarmed by the spoiling and destruction of the natural world and inspired by the words of earlier writers such as Aldo Leopold and Rachel Carson, people sought to reform this value and belief system without presenting any serious challenge to its main assumptions and attitudes. They began forming action groups to combat polluting factories, the building of dams which would be highly destructive, and so forth. They are "reformists"\textsuperscript{17} and they form one of the two branches of the environmental movement.\textsuperscript{18}

Although the reformist tradition is one of the two branches of environmentalism, Greens heavily criticize it because, in their view, reformists have an anthropocentric perspective, one which accents human affairs above those of Nature.\textsuperscript{19} Reformists, then, criticize the unrestrained, irresponsible use of natural resources without disagreeing with the anthropocentric approach from which this policy originates.\textsuperscript{20} Their stance is that we must conserve our finite natural resources so that future generations may enjoy the same quality of life that we have.

\textsuperscript{17} Sessions & Devall, pg. 52.
\textsuperscript{18} Gancher, forward of Dobson, Andrew (ed), \textit{The Green Reader} (San Francisco: Mercury House, 1991), pg. x-xi.
\textsuperscript{19} Sessions & Devall, pg. 52.
\textsuperscript{20} Sessions & Devall, pg. 56.
Even within the realm of political action, Greens criticize reformists because "single-issue environmental [i.e. reformist] campaigns and Green politics proper [differ in that] the former treats symptoms while the latter deals with causes".\textsuperscript{21} Furthermore, Greens have concluded that reformist environmentalism is analogous to "running a battlefield aid station in a war against a killing machine that operates just beyond reach, and that shifts its ground after each seeming defeat".\textsuperscript{22} It is perhaps not surprising that Greens use words against reformism which are nearly as strong as those they level against the dominant world view and its adherents. One prominent Green, Murray Bookchin, in the "Open Letter to the Ecology Movement", states that "from an outlook and movement that at least held the promise of challenging hierarchy and domination have emerged a form of environmentalism that is based more on tinkering with existing institutions, social relations, technologies, and values than on changing them . . . [this] environmentalism is merely environmental engineering".\textsuperscript{23} He criticizes the fact that reformists stick to the belief in a Nature which is passive to the actions of human beings. Bookchin also complains that reformists use ecology "to 'win' large constituencies, \textit{not to educate them}".\textsuperscript{24} Even as J. Ronald Engel in

\textsuperscript{21} Dobson (ed), pg. 4.
\textsuperscript{22} Berg, Peter, from Sessions, pg. 3.
\textsuperscript{23} Bookchin, Murray, \textit{Towards an Ecological Society} (Montreal: Black Rose Books, 1980), pg. 77.
\textsuperscript{24} Bookchin, pg. 82.
his edited volume on sustainable development tries to ease this conflict by pointing out that these two factions are indeed part of the same movement and together can accomplish more for world ecology than they can apart.25 Most Greens, it would seem, believe this is impossible because reformists are committed to a way of life and system of belief that Greens reject.

Reformists have been quite successful in their struggles for the resolution of specific local environmental problems. The Sierra Club, the Wilderness Society, and the Audubon Society are examples of national and international groups which have struggled and succeeded in many public policy forums.26 They have been successful in banning destructive traps, preserving forests and wetlands, and protecting disappearing species by lobbying for their designation as endangered species. Another arm of this reformist political movement is resource management, which is now an entrenched part of the American bureaucratic structure. Managing of public lands is the responsibility of governmental managers. Their commitment even to reformist environmentalism, then, is often questioned. Even so, resource management, generally speaking, is conservationist, and both its conception and suggested treatment of the land indicate a view in which Nature is a farmland, to be utilized and managed as a farmer would tend a field of corn.27

25 Engel, pg. 8.  
26 Gancher, from Dobson, pg. 8.  
27 Sessions & Devall, pg. 56.
In short, Greens see themselves and reformists as two very different peas in the same pod; both are factions of the environmental movement, but while reformists feel that the present system with its underlying assumptions and attitudes is flexible enough to accept and bend to the changes which are needed to protect the environment, Greens, quite simply, do not.\textsuperscript{28} One Green writer, Brian Tokar in his book \textit{The Green Alternative}, has even stated that such reformist actions in public policy "merely forestall the impending collapse of the industrial economies . . . ",\textsuperscript{29} forestalling, then, the end of the way of life those economies support.

\section*{III. The Green Approach}

In reaction to what they perceive as the destructive effects of the dominant world view and the limitations of the reformist program, Greens have devised an alternative which acknowledges the independent value of Nature while striving to preserve the integrity and rights of human beings. This alternative is a complete way of life as well as a protest. It has proposed a different political system and strategy; an educational ideal; a systems, steady-state economics; a different societal structure; and an underlying philosophy. And it has, as have radical alternatives of the past (including the world view which is now dominant), several utopian

\textsuperscript{28} Gancher, from Dobson, pg. x.

\textsuperscript{29} Tokar, Brian, \textit{The Green Alternative} (San Pedro, CA: R. & E. Miles, 1987), pg. 138.
visions. For the purposes of this work, my main focus will be on its philosophy, that is, its world view.

i. Ecology

The Green world view assigns the science of ecology a crucial role. So crucial is it, in fact, that Andrew Dobson starts his anthology of readings called *The Green Reader* with the *OED* definition of the word 'ecology'.30 Ecology frames the Greens' approach in that its theoretical concepts and entities are the model by which Greens hope that people can understand and act in their world. Ecology is, like environmentalism, a twentieth-century phenomenon. The term "ecology" evolves from the Greek word "oikos" which means home,31 and as such ecology is mainly concerned with the relationships between the Earth and its living organisms, and with the individual relationships between those organisms which collectively compose the biotic community. Ecology involves what was in the early twentieth century called an economy of Nature,32 and the environment within which this 'economy' functions includes not only the physical landscape or water basin, but the weather, the particular types of soil in that area, the seasonal changes in patterns of daylight, as well as all of the living organisms.33 The relationships between the organisms and their environment,

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30 Dobson, pg. 1-3.
32 Callicott, pg. 82.
33 Owen, pg. 1-2.
Furthermore, are as crucial to an understanding of the whole as are the actual organisms. These relationships can be said to be even more important, because the interrelationship of organism and environment creates what is a fundamental reality of ecology: homeostasis. Homeostasis is the ecological precept that each combination of organism and environment forms a shifting, but constantly balanced whole in which changes are basically absorbed by variations in the total system. The system, called an ecosystem, is dynamic, controlling and changing independently as it is faced with changes from its individual constituents.

The life forms themselves are what make homeostasis a reality. The biologist and environmental theorist J.E. Lovelock postulates in his Gaia hypothesis that all of the separate, distinct life forms on Earth together constitute a dynamic and homeostatic system and in turn make the whole of life together a single living entity, meaning that the Earth as a whole is alive. This is what Lovelock calls the Gaia hypothesis. Furthermore, whereas the dominant world view's version of evolutionary theory states that life on Earth and comfortable planetary conditions evolved simultaneously but separately, Lovelock contends that these conditions did not evolve separately, but were dependent upon each other for that development.34

This conglomeration of life and of forces of the atmosphere, the sea, and the land, are the Earth. By virtue of these forces, according to Lovelock, the Earth regulates itself, maintains its environment through active control and manipulation, and as a whole is much more powerful than any of its constituent parts alone. Lovelock admits that there is no way to prove that the Earth is alive quantitatively, as science demands that evidence be presented. Qualitatively, however, he claims that the reasoning is sound. Since in ecology, ecosystems’ processes of active variation and accommodation to new parts is a process of active control, originating from the system, Lovelock postulates that one can reify the whole, and say that by virtue of this internal, independent activity, the Earth itself is actually alive.

Within these systems, species’ populations are also stable. Breakdowns in ecosystems do occur, however, even with this self-regulation, and when they do, certain species may experience rapid population growth or, conversely, extinction. Interestingly, this seems to occur mainly in ecosystems where there is little diversity of species, such as high-altitude areas or inhospitable climates. Such large-scale changes are much less likely to happen to the ecosystem as a whole. Nonetheless, desertification and other such ecological tragedies are realities to twentieth century humanity.

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35 Lovelock, pg. 9.
36 Owen, pg. 22.
37 Owen, pg. 194.
ii. The Green World view

As well as understanding nature in these ecological terms, Greens also incorporate them into their approach to human life. Greens theorize that humans and Nature have the same status and are subject to the same forces, and as such Greens use the same approach for humans and Nature. By using the science of ecology in this way, Greens feel that they radically alter "our understanding of ourselves, severally, and of human nature, collectively". In other words, from this "altered representation of the environment", certain conceptual notions about life and the interrelationships between life forms become evident.38

Greens hold that this switch to ecology changes the way in which people literally think about their world. Whereas in the dominant world view, the analytical method of thought popular in physics is encouraged and is the best way in which one can 'analyze' and understand the world, ecology emphasizes what might be called "systemic thinking". In systems biology, biologists talk of not only the organism as a "unit of survival", but of, critically, the organism and its environment together as a unit. The individual organism cannot be understood when viewed by itself, in isolation; rather, only when it is viewed in its natural environment, amongst the various other life forms and the landscapes from which it developed,

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38 ibid.
can it be understood.\textsuperscript{39} Within this reasoning, something is good for one part of a system when it is considered to be good not only in relation to its own situation but in relation to that of the whole system; conversely, what is good for the whole system has to be considered so in relation to its constituent parts as well as for itself. What is truly good for humans, then, must be something which is good for the whole ecosystem within which that group of humans lives.\textsuperscript{40} While modern society does not follow this principle, they do follow the converse, in that what is good for the world ecosystem must be so for humans as well. Greens hold that following this line of thought in one direction as above, without following it the other way is meaningless. Ecology, they hope, will be able to bring this method of thought to human relations, culture, and society, as well as to human relations with Nature.

Thinking about the world in this way leads to a fairly strict holism. The man to coin this term and develop the concept of holism, Greens embarrassingly report, was Boer General Jan C. Smuts, the "scourge of Mahatma Gandhi and Prime Minister of South Africa".\textsuperscript{41} In 1926 he wrote his thoughts on the functioning of human and non-human life, and the work was ultimately called \textit{Holism and Evolution}. His definition of holism, which is part of the reasoning behind the Gaia hypothesis as well as ecology, is:

\textsuperscript{39} Engel, 80-81.
\textsuperscript{40} Engel, pg. 83.
\textsuperscript{41} Dobson, pg. 255.
the whole is not a mere mechanical system. It consists indeed of parts, but it is more than the sum of its parts, which a purely mechanical system necessarily is. The essence of a mechanical system is the absence of all inwardness, of all inner tendencies and relations and activities of the system or its parts. . . A whole, which is more than the sum of its parts, has something internal, some inwardness of structure and function, some specific inner relations, some internality of character or nature, which constitutes that more.42

Greens have made this concept a crucial part of their thinking, understanding it perhaps most simply as the "economy of Nature". Just as in capitalist economies, for example, purchasing patterns of individuals affect the whole economy and its distinct characteristics and its viability, so does the individual organism, its living patterns and behaviors affect the functioning and characteristics of the ecosystem. Furthermore, these individual parts depend upon the stable functioning of the whole, and as such they depend upon all other individual parts of the whole as well.43 Ecology is, then, a theory of interrelationships and of interdependencies.

Some Greens have argued that holistic definitions and systemic methods of thought should be used as the basis for teaching children in school44, and, even more radically, Aldo Leopold in 1949 used it as the basis for a new morality. He postulated that "a thing is right

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42 Dobson, pg. 256.
43 Callicott, pg. 23.
when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise.\textsuperscript{45} Leopold called this his Land Ethic, and he saw it as perhaps the only way to reestablish balance and harmony with Nature, because even if people understand and accept that it is their duty to preserve and live in harmony with the biotic community, unless this understanding is accompanied by moral conscience, then the present self-centered and destructive treatment of the Land will not change.\textsuperscript{46} Dobson calls this moralism a "general environmental rule of thumb", but Callicott believes that when one looks at it in conjunction with both Leopold's work and Callicott's analysis of Leopold, it is obviously much more.\textsuperscript{47} Leopold uses holism, and his belief in the intrinsic value of the biotic community, as the moral, not just conceptual, foundations of a new world view.

Many philosophers have rejected this Land Ethic as a "naive, moral plea, altogether lacking a supporting theoretical framework, . . . [i.e.] foundational principles and premises which lead, by compelling argument, to ethical precepts".\textsuperscript{48} Callicott disagrees with such critics, arguing that Leopold's ethic does have a supporting theoretical framework which includes all of the same concepts and values which are embraced by the Green approach: the integrity of

\textsuperscript{45} Callicott, pg. 21.
\textsuperscript{46} Callicott, pg. 70.
\textsuperscript{47} Dobson, pg. 238.
\textsuperscript{48} Callicott, pg. 76.
the community, homeostasis, holism, biocentrism, and harmony with Nature are all implicated in Leopold's one moral precept and his subsequent argument in its defense. According to Callicott, Leopold relies on evolutionary and ecological biology to provide the conceptual foundations of the Land Ethic. Evolutionary theory provides the concept of harmony and kinship with Nature (which is admittedly a different interpretation of evolutionary processes than Darwin's survival of the fittest). Ecological biology provides the community concept in both human and natural realms.\textsuperscript{49}

Leopold also argued that it is through education that the Land Ethic could become entrenched in a culture and be made a part of a "cultural institution."\textsuperscript{50} In this process, the Ethic would need to become a primary focus of educational programs.\textsuperscript{51} Thus, Leopold was critical of modern education, questioning its emphasis on classification, memorization, and its fragmentation of knowledge into different subjects and was one of the first advocates of interdisciplinary education.\textsuperscript{52} This is itself a natural by-product of a holistic worldview, for if it is indeed the case that all single entities are parts of a conglomerate whole, and that they cannot be understood except within this larger context, then fragmented education makes no sense.

\textsuperscript{49} Callicott, pg. 82-83.
\textsuperscript{50} Callicott, pg. 223.
\textsuperscript{51} Callicott, pg. 223.
\textsuperscript{52} Callicott, pg. 227.
The concept of intrinsic value for both individual species and the Earth itself is another important aspect of Green thought. In believing that non-human life forms have value in and of themselves, Greens embrace a non-anthropocentric perspective. Rather than attributing value to non-human species only insofar as they are useful to humans, Greens focus on the biotic community, a position they call biocentrism. Biocentrism upholds the rights of the biotic community in that no one species dominates others in the way that traditionalists hold humans do the Earth. Biocentrism postulates that the whole Earth ecosystem is a complex array of mutual associations and interactions, not of domination and subjugation.\textsuperscript{53}

Callicott goes even farther, saying that the system, the biotic community, \textit{precedes} the individual species. In other words, "ecosystemic wholes are logically prior to their component species because the nature of the part is determined by its relationship to the whole".\textsuperscript{54} Species develop certain characteristics through the process of adapting to their environment, and these characteristics, then, suit their environment, not the other way around. It is a symbiotic situation as well, because the ecosystem varies itself, too, as changes occur in individual organisms. As further explanation, it is useful to recall the definition of homeostasis: that it is only when there is a \textit{breakdown in the system} that a species

\textsuperscript{53} Dobson, pg. 80.
\textsuperscript{54} Callicott, pg. 111.
might become destabilized and suffer rapid population growth or, conversely, extinction.\textsuperscript{55}

The ecological concept of homeostasis is brought into the Green world view in other ways as well. First and foremost, Greens use it in their approach to Nature and in their ideal for human impact on Nature. Kirkpatrick Sale, in "Mother of All", states that from ecology's principle of homeostasis, it follows that a human economy would ideally be bioregional. That is, humans would be based in a particular "bioregion", which is an ecosystem whose natural landscape defines its borders. Such an economy would strive to maintain the stability of that bioregion (maintaining its individual parts as well) and would therefore also attempt to accommodate people's lifestyles and practices to the capabilities and needs of the environment. Such an economy would work towards achieving a balance, a 'steady-state'.\textsuperscript{56} This same philosophy of economy would apply to inter-human economic as well as human-environment interrelations. Instead of striving for constant improvement, 'progress', in their economy, nations and communities would work for balance.\textsuperscript{57}

Another important consequence of ecological homeostasis as it is applied to humans is the reemphasis of community. Greens

\textsuperscript{55} Lovelock, pg 152.
\textsuperscript{56} Sale, Kirkpatrick, "Mother of All" (in Kumar, Satish, The Schumacher Lectures, Volume 2., (London: Abacus, 1974)) from Dobson, pg. 79.
\textsuperscript{57} Sale from Dobson, pg. 79.
assimilate the importance of community into every aspect of their thought. Politically, they encourage "Think[ing] Globally, Act[ing] Locally", a phrase which was picked up by West German Greens and has been adopted by the worldwide peace movement.\textsuperscript{58} Greens hope that through encouraging community action and establishing community-based institutions, democracies, and even educational systems, a potent source of power countering and challenging the dominant world view and its own institutions will emerge.\textsuperscript{59} Furthermore, they hope that widespread "local self-reliance" will also emerge. Not only would this strengthen the communal basis of life and create a community economy, but it would also reduce pollution and waste. For instance, polluting delivery trucks in America make daily drives from one coast to the other (a good 3500 miles) to deliver produce from California to supermarkets in Boston. Ideally, Greens hope that if one lives in a coastal town, then one would eat a lot of fish, while if one lived in the western ranges, one would not eat a lot of fish. This is what Tokar calls "bioregional consciousness and an ethic of local self-reliance".\textsuperscript{60}

Throughout this discussion, one of the most crucial postulates of the Green world view has remained unaddressed; namely, that humans, above all, need to live in harmony with Nature. Greens believe that humans need to strive to live within their bioregion not as

\textsuperscript{58} Tokar, pg. 138.  
\textsuperscript{59} Tokar, pg. 147.  
\textsuperscript{60} Tokar, pg. 147.
aggressors or opponents of Nature, but as co-workers with Nature. Greens issue a warning meant to urge the adoption of this norm, saying that humans, by acting as aggressors and attempting to dominate Nature, are effectively ensuring the reduction of the quality of life of future generations by destroying the very world within which they survive and thrive. Nature, as Callicott says, is not an attic full of odd pieces of furniture which can be thrown out or moved elsewhere without disturbing the natural balance of the whole.\footnote{Callicott, pg. 183.} If the Earth was a house, dismantling the kitchen would mean that the inhabitants would have no place to sit and eat. Presumably, the inhabitants would adapt, deciding to eat somewhere else. This process could continue, however, until there was nothing left in the house for one to remove or alter. The 'standard of living', then, by which traditionalists justify their domination of Nature through scientific and technological advances and through their largely unchecked consumption, would certainly be much, much lower.

For all its advantages, however, there are quite a few potential problems with the Green way of life, one of which concerns the position of the individual. Certainly, the rights of the individual should be defended and not degraded, but how is that possible considering the elevated position of the community in the Green program? This has been an issue of contention since the 1940's.
when Leopold established his "Land Ethic" of preserving the biotic community.\textsuperscript{62} Ethicist Mark Sagoff is one such critic, and in his paper "Animal Liberation and Environmental Ethics: Bad Marriage, Quick Divorce", he answers that the Green world view does not, in fact, uphold the rights of the individual. Basically, he says, Nature is not fair, it does not respect the individual, and this is true for humans as well as other species.\textsuperscript{63} This criticism, however, overlooks one of the main points of homeostatic ecology: "... complexity (in terms of species diversity) is correlated with stability".\textsuperscript{64} In this way, to preserve the integrity of the whole, the diversity of species must also be preserved. Each individual, then, is important if the whole is going to maintain its balance.

The Green objective is not to abolish all evil and unfairness in the natural or constituent human worlds. In the affairs of Nature (which includes those of humans), the goal is to allow Nature to function as free from human interference in the natural balance as possible.\textsuperscript{65} In human affairs, the key is to accept human nature as we also would Nature, and instead of fighting human nature and trying to control it absolutely, we would try to accommodate it, accepting it for what it

\textsuperscript{62} Dobson, pg. 238.
\textsuperscript{64} Owen, pg. 194.
\textsuperscript{65} Notice that I say human interference in the natural balance, not in Nature. Every species, in interacting with their environment, changes that environment, and this is not problematic until homeostasis in that ecosystem is destroyed. This is the level of interference which Greens want to curb.
is. Instead of people perceiving themselves in conflict with their world and striving to 'fix' it, perhaps they can actually improve their quality of life by striving to live with how they are and how their world is. In this way, "we must dream of systems . . . which allow people to be people, in all their variety . . . ".66 In a sense, then, this does duplicate the unfairness of Nature in that people, in such a system, could be bad or unfair to others, and there would always be someone to whom they were being bad or unfair. There are those who will die in wars and those who will suffer persecution.

To Kirkpatrick Sale, the key to dealing with this unfairness is to keep a "strict eye" on such events.67 This is perhaps the biggest flaw in the Green approach in that there is no clarity as to what form such a "strict eye" would take. Greens envision a global human community composed of smaller communities, much as there is a global ecosystem within which smaller individual ecosystems thrive. Within these smaller "bioregional" communities, Greens believe that humans will form their own culture, beliefs, and customs while still adhering to the general Green world view, much as nations around the world now adhere to the dominant world view while maintaining different cultural identities. Furthermore, through global communication, bioregional communities will maintain a concern and involvement in other bioregional communities and in the global communities.

66 Sale from Dobson, pg. 81.
67 Ibid.
All of this is consistent with and results from ecosystemic thinking; it is reasonable that these communities would have inter-relationships with each other and with the global community. It does not, however, follow that all the individual people within each community would maintain this same concern and involvement. In fact, as the German Green movement has discovered, they do not. While the Greens in Germany have been very successful locally, more so than reformist American groups, networking such local action groups into a significant challenge to national politics has proven to be extremely difficult. The reason such local action and concern has not translated into national, much less global, action and concern is itself evident from a closer glance at the science of ecology. In an ecosystem, all individual organisms act on, vary with, and live within the ecosystem, but in no concrete sense do they do any of these things within the global ecosystem. Greens can consistently argue that the active effect individuals have on the global ecosystem and vice-versa follows from this principle because there is a network of interactions, but there is nothing concrete which indicates such an interrelation between the smallest element, an individual organism, and the largest, the whole planet.

This lack of concrete cause and effect is the key to the problem. When Kirkpatrick Sale suggests that the global community should keep a "strict eye" on the actions of individual communities, the
Green approach falters, because such a watchdog individual would be taking their local actions, abstracting them into local thinking, then abstracting them further into global thinking, and finally making judgements and acting on what they think globally. This is in direct contrast to the Green slogan, "think globally, act locally", in which Greens want people to think globally and act in their local communities from what they perceive on the global scale. In this case, people must turn the global abstractions into concrete plans in order to act from them. As such, people would take their global thinking, their abstract thought, and make those thoughts concrete by translating them into local thinking, into local concerns, beliefs, and values. The local thinking, then, is that from which they would act. In the former case, Greens are assuming that humans are capable of acting from a conception which is highly abstract, and this contradicts the Green desire to accommodate and do not try to change or "better" human nature because it argues that individuals should be globally concerned and aware and should act within a concept of the global as well as the bioregional community. People act from the concrete, not from the abstract (especially when they have a strong sense of their local rootedness, their community), and this would have to change before any global action would be possible within the Green world view, short of establishing some sort of global non-democratic, if not totalitarian, regime, a suggestion which Greens would certainly reject. This is the problem encountered by German Greens, and if Greens indeed want to
maintain this global movement as a part of their approach, then they are going to have to redress the issue of how they are going to accomplish this.

Another problem German Greens have had in nationalizing their efforts is that much of their national program has been co-opted into the mainstream. This is essentially a failure, because the system itself has not changed and therefore the national program of the German Green movement has become reformist environmentalism. This is true even though many political objectives have been accomplished, because without the major changes to the system, such co-option weakens the total program by narrowing its effectiveness to only short-term goals. Long-term environmental security is not possible in this case. As such, the prospect of a global Green movement is highly improbable until most of the localized communities have rejected the mainstream system and have created their own Green way of life.
Chapter 2 -- The Chesapeake Bay Oyster

Greens claim that their view is a valuable and legitimate alternative and is superior to the current view. In this chapter, I analyze an ongoing environmental public policy debate, the oyster debate of the Chesapeake Bay area, and in doing so, I continue my dual purpose of adding insight to this debate and of testing this purported usefulness of the Green world view. There are two sections in this chapter, the first of which is a history of the oyster debate from the year 1989 to February, 1992. The second section is an analysis of these events and the reactions of participants to them in an effort to characterize both their perceptions and views towards the issues of the debate. This chapter, then, provides the main analysis of the oyster debate, and it lays the foundations for assessing the usefulness of the Green perspective to current, local issues.


The main issue of this debate is how the states of Maryland and Virginia should proceed in order to reverse the impending

68 Much of the first eight pages of this chapter was originally presented as part of a conference paper at the Society for the Social Studies of Science (4S) meeting in Boston, November 1991. That paper was presented by the author and was co-written and co-researched with Charlotte Webb.
disappearance of the native oyster, C. virginica, from Chesapeake Bay waters. The Chesapeake Bay oyster, C. virginica, was once a flourishing species, providing ecological benefits as well as substantial economic contributions to the Bay fishery, but the oyster population has been reduced to a mere 1% of what it was in 1890\textsuperscript{69}. The twin causes of the decline are disease and, in all probability, overfishing, although there is sharp disagreement between scientists and watermen in how the latter has contributed to the problem.

This severe decline in the oyster population has had both ecological and economic repercussions. Ecologically, the native oysters form a basic, integral part of the Bay's ecosystem, mainly because they are reef-forming organisms, providing food, habitat, and protection for other organisms living in the Bay\textsuperscript{70}. Furthermore, because they are filter feeders, oysters have the ecologically crucial ability to filter Bay waters, in the process removing impurities that include the extra nutrients which are a result of pollution runoff\textsuperscript{71}. With the decline in numbers, oysters now take approximately 340 days to filter all of the water in the Bay, whereas in the 19th century, the oyster was able to accomplish the same task in just three days.\textsuperscript{72}

\textsuperscript{70} Mann, Roger et al., "The Decline of the Virginia Oyster Fishery in Chesapeake Bay: Considerations for Introduction of a Non-endemic Species, *Crassostrea gigas*" (Gloucester Point, VA: VIMS, Contribution number 0000, 1991), pg. 3.
\textsuperscript{71} Horton, pg. 28.
\textsuperscript{72} Mann et al., pg. 3.
Economically, the Chesapeake Bay was once the leading producer of oysters in the world, and until the 1970s, the Bay was still one of the major producers despite the continuous decline in oyster populations\textsuperscript{73}. Now, however, it is in serious straits. Whereas in the 1970's the annual oyster harvest was around 2 million bushels, it is now, in 1991, 500,000 bushels baywide.\textsuperscript{74} The struggling yet sizable and traditional oyster industry in both Virginia and Maryland is one which is composed of a varied and diverse set of professionals: watermen, shuckers, packers, distributors and purveyors of the oyster to the public. Within this inter-state industry, the decline of the oyster population in Virginia waters has been much worse than the decline in Maryland, where lower salinity levels have kept in check the worst ravages of the two major diseases, the parasite called MSX\textsuperscript{75} and the fungus Perkinsus marinus, or Dermo\textsuperscript{76}. This state of affairs, in turn, has the oyster industry of Virginia close to the verge of collapse, while Maryland's industry is still viable, having brought in 400,000 of the 500,000 bushels of the 1990 harvest. As a result of this, there is a split between Maryland and Virginia packers and watermen that has at its base very different economic realities.

\textsuperscript{74} Roanoke Times & World News, pg. F6.
\textsuperscript{75} Joyce, Christopher, "The Scourge of the Biovalve," \textit{New Scientist} (117(7 Jan 1988):56-59), pg. 56.
\textsuperscript{76} Joyce, pg. 56; CBF Marine Notes, September 9, 1991, pg. 1.
Policy makers, watermen and businessmen in both Maryland and Virginia want to rescue this once-profitable industry. They also want to protect the traditions surrounding the industry; traditions in which the oyster has been a symbol of the bounty of the Bay since the landing of John Smith, and in which the watermen who harvest the oyster are also somewhat romantic figures whose value is perhaps more important symbolically than economically. As a Virginia policy maker recently said, "the waterman is the cowboy of Virginia". The waterman, like the oyster, has been seen by the public to be a figure at risk for some time, a view which was intensified in Virginia by the temporary closure of the James River, Virginia's primary seed oyster resource, in the 1970's as a result of the discovery of a toxic chemical in the river.

Although the population of oysters, as well as the numbers of the watermen and of others involved in the oyster business, has been dwindling since the 1920s, the debate which is the subject of this study began when a few scientists at the Virginia Institute of Marine Science (VIMS) proposed to address the problem by introducing a non-native species of oyster, Crassostrea gigas, into the Bay. C. gigas, popularly referred to as the Japanese oyster, has been introduced through human intervention in other parts of the

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78 Tolton, Telephone interview.
79 Hargis, Telephone interview. 30 October 1991.
world, proving to be an economic and ecological success in places where less hardy oyster species had died off. For instance, France, Australia, New Zealand, and the west coast of the United States have all introduced the oyster. In many of these places, however, the C. gigas oyster has perhaps been too successful, so that in some places it has become a nuisance organism; or, as it has been dubbed in New South Wales, Australia, a "noxious fish".80

The chief motivation of the VIMS (Virginia Institute of Marine Science) scientists in suggesting the introduction has less to do with the economic significance of this shellfish than its ecological value. VIMS scientists reason that the oyster forms such a vital part of the ecosystem that the Bay cannot afford to lose it. Whatever the contribution of overfishing to the declining oyster population may have been, the two diseases rampant in the Virginia waters have increasingly killed more and more of the native oyster; therefore, to these scientists, introducing a disease resistant non-native species is a reasonable solution to a critically important ecological problem. Efforts to breed disease-resistant variants of the C. virginica oyster, having proved futile to date (not only in Virginia, but also in Delaware81), VIMS scientists began experimenting with C. gigas in an effort to test the gigas oyster for susceptibility to MSX and Dermo.82 During in-lab experiments,

80 Ayers, from Conference proceedings "The Oyster: Ecology and Management", (MDNR (Maryland Department of Natural Resources): Annapolis, MD, 30-31 October 1991).
81 Tolton, telephone interview.
82 Conference proceedings.
scientists found that the gigas oyster was resistant to *Dermo*. They were, however, unable to import the elusive parasite *MSX* into the laboratory. In other words, they were unable to infect any species of oyster, gigas or virginica, with *MSX* under laboratory conditions.

It was at this point that a few VIMS scientists proposed overboard experiments; that is, they asked the Institute to put triploid, laboratory-bred C. gigas overboard in a controlled, monitored area.\(^{83}\) The fact that the oysters had been laboratory bred for two generations, meant that the oysters would be disease-free themselves; the fact that they were 90% triploid meant that they would nearly all be infertile\(^{84}\). The latter was, from the point of view of the scientists, critical, because C. gigas under even less than ideal circumstances is a vigorous breeder. VIMS meant to reassure the policy makers that the potential for these heavy breeders to disseminate themselves throughout the lower Bay, and potentially the upper Bay, would be minimal.

In 1989 VIMS scientists brought their formal request to the Virginia Marine Resources Commission (VMRC), the policy-making body for fisheries in Virginia, but their request was denied. It was clear that the majority of the Commission members believed that any overboard experiment would essentially be a wholesale introduction because gigas would be likely to spawn and set. Commission

\(^{83}\) Mann, personal interview. 30 October 1991.

\(^{84}\) Conference proceedings.
members also appeared to believe that the possibility that the gigas
would even introduce more diseases to the native C. virginica was
too great to risk at this time.\textsuperscript{85} In their view, the proposal brought
too great a risk of further destruction to both the native oyster and
to the entire Bay.

This initial VIMS request was the main instigator of the current
debate, and concerned groups immediately began to mobilize and
maneuver for position. Debate was further heightened in Virginia
when Governor Wilder, through the secretary of Natural Resources,
appointed a Blue Ribbon Oyster Panel, appointing representatives
from a variety of professions, to look at the decline of the oyster
and to make recommendations for a management plan for Virginia.\textsuperscript{86}

At the same time, policy makers, businessmen and scientists in
Maryland also began to maneuver for position in the debate, since it
was widely, and, as it has developed, correctly assumed, that the
Panel would take a strong position\textsuperscript{87}. Participants in this debate,
then, can be divided into four groups: industry representatives,
including packers, planters, watermen and seafood processors; the
policy makers; the scientific community; and the Chesapeake Bay
Foundation.

\textsuperscript{85} Hargis, telephone interview.
\textsuperscript{86} Hargis, telephone interview.
\textsuperscript{87} Blue Oyster Panel, "Recommendations -- Draft 1.0 of the Holton Plan for Restoring
First of these, the representatives of the oyster industry, generally all those from watermen to distributors, are chiefly concerned with economic issues; not surprisingly, their goals are to save jobs and to make money. Even with this pragmatic, capitalistic attitude, however, members of this industry are still quite bound by the time-honored traditions that still hold sway in the oyster business. In other words, while they clearly want to obtain the best cost/benefit ratio possible, they are unwilling to change traditional practices.\textsuperscript{88} It is this attitude towards traditional practice that lies behind the split inside the oyster business itself; between those who support the introduction of C. gigas to Virginia waters and those who oppose it. Oyster packers and planters of Virginia, particularly, appear to view the introduction of the non-native species as a solution to their economic troubles, while many of the Virginia watermen are vehemently opposed to it.\textsuperscript{89} The latter group draws support from Maryland, where industry's watermen and policy makers are united in their opposition to the introduction of a species that they view as a potential economic threat. All cystemen, however, believe the oyster industry itself is valuable, not only because of the economic benefit they and the states gain, but also because of the traditions associated with the industry. In this sense, the cystemen value the oyster for its economic importance, and at the same time they


\textsuperscript{89} Shabman, personal interview. October 1991.
attribute an intrinsic value, hinged upon tradition and history, to the oyster industry.

The policy makers of both Maryland and Virginia, with their responsibilities of managing the oyster fishery and appeasing their constituencies, also hold views which differ in ways similar to those of industry representatives. Maryland’s policy-making body, the state’s Department of Natural Resources, has predictably taken a strong stand against the introduction of C. gigas, demanding that Virginia not approve its introduction into Virginia waters\(^\text{90}\). Feelings are so strong, that recently one member of the staff of Maryland’s DNR said, "I think its accurate to say, and I’ll check with my lawyers on this . . . I believe I can stop it [an introduction of C. gigas]. There’d be one hell of an argument if Virginia did it.\(^\text{91}\)" While one might expect that Virginians would be vigorous in support of the introduction of a species that might revitalize the dying Virginia industry, I observed that the policy-making body, the Virginia Marine Resources Commission, is itself split. While most of the present staff members of the VMRC support the introduction, the Associate Members of the Commission, who are the final voters on fishery proposals and are themselves political appointees, are far more reluctant to support the introduction of C. gigas. This, I believe, is evidence of the fact that the short-term benefit which the oyster industry might gain via an introduction is not what these Virginia

\(^{91}\) Brancher, telephone interview. October 1991.
policy makers most value. In their view, the long-term stability of both the oyster industry and the Bay itself is what must be sought and preserved.

The views of the scientists who are considered experts in this debate, unlike those of their policy-making and industry counterparts, are hard to characterize because there is no sense of organization within the scientific community. At the Maryland conference in October 1991, scientists were called from Maryland, Virginia, Delaware, and even Australia and California (places C. gigas has been introduced by humans). Of these, the Maryland and Virginia scientists (of whom I will be speaking) were certainly the most vehement, but their views varied from one extreme to another. Some believed that the C. gigas should be tested for MSX in bay waters as soon as possible, because they believed that the native C. virginica was a lost cause, while others, even from the same research group, felt that there was no way to make such a claim and more should be done to save the native oyster. These views, then, could not be categorized by the geographical region out of which the scientists worked, nor could they be characterized by their institutional affiliation. They could, on the other hand, in part be explained by the differences between scientists in what was considered to be the cause of the decline. For instance, in the above research group, it seemed that those who attributed the oyster decline mainly to the effects of disease were generally in favor of
the introduction. Conversely, those who believed that the decline was due to the effects of overharvesting were against any foreign introduction.92

One research body which has taken a stand as an institution reflects this partial explanation. The Virginia Institute of Marine Science, with its recent appointment of a new director (having previously been under the leadership of an interim director), has issued an official statement to the Virginia Marine Resources Commission of their view of both the oyster's predicament and the best course of action. In their considered opinion, the C. gigas oyster should not be tested in bay waters right now; rather, a halt on fishing for an undetermined amount of time would probably be the best thing for the oyster and the industry at this point. They believe that "overharvest remains the issue that is fundamental to the problem".93

Although no Maryland research body has submitted a similar statement,94 in 1990 Maryland brought together many of their

92 This could be a conceptual distinction or a rhetorical one in that in the latter case, scientists could be accepting the cause which fits their own sense of the oyster's and the Bay's value.

93 VIMS position statement, pg. 1.

94 It is important to note that the Virginia Institute of Marine Science has an official, legal relationship with the policy-making body, the Virginia Marine Resources Commission. The VMRC is legally bound to gather information from the Institute before it makes any recommendations, and VIMS is legally bound to research the areas in which the VMRC needs information. This official relationship is a major difference between the marine resources management strategies of Maryland and Virginia, and with this difference, I have found that the positions of Virginia scientists are much more openly
scientific experts on oysters and created the Wolman report. Motivated by their concern for the troubled oyster industry, the committee reviewed Maryland's policies towards oysters in their report, and they recommended that the state begin encouraging private as well as public fisheries, and that research into aquacultures and the oyster diseases be upscaled.\textsuperscript{95} At that time, however, they made no mention of any radical reforms to Maryland's oyster management practices; they are still committed to changing the present system in little ways to try to get what they want.

The Chesapeake Bay Foundation, on the other hand, would like to see some positive action taken as soon as possible\textsuperscript{96}. Since early in 1991, the CBF has been recommending that a three-year moratorium be implemented on fishing, so that the oyster is given a chance to rebound from the dual stress of harvesting and disease.\textsuperscript{97} During the summer of 1991, the CBF was the first to suggest publicly that such a reduction in harvest pressure would be the first step to restoring the oyster population. Their own proposal and their rejection of the proposed introduction reflects their view that whether the oyster decline is due primarily to overharvest or to

\textsuperscript{95} Maryland Department of Natural Resources, Chesapeake Bay: Oyster Management Plan (Annapolis, MD: September 1989); referred to as the Wolman report, pg. 1-3.

\textsuperscript{96} The Foundation, with its main office in Maryland, is a privately funded, non-profit organization which boasts 83,000 members and four offices: the main office in Annapolis, Maryland; two in Virginia (Richmond and Norfolk); and one in Harrisburg, Pennsylvania: CBF literature November 1991 pamphlet entitled "CBF: Environmental Education, Environmental Defense, and Land Management.

\textsuperscript{97} Goldsborough, telephone interview (2).
disease, it is unreasonable to continue exerting two stresses on the organism when at least one of them, harvesting, can be controlled. At this time they submitted a five point proposal in which they recommended that the Bay Program adopt the goal of raising the oyster numbers to one-third of what they were in 1870 by the year 2020, that federal agencies work in conjunction with the states of Maryland and Virginia to restore oyster reefs, that remaining natural oyster bars be declared sanctuaries, and that aquaculture and research on the diseases MSX and Dermo be made high priorities.\footnote{Baker, William C. (president of CBF), Letter to the Honorable William K. Reilly (U.S. EPA), (Annapolis, MD: Chesapeake Bay Foundation, 11 July 1991). pg 1-2.}

Since then, the Foundation's restoration program has expanded to include the three-year moratorium on fishing, combined with a program which would employ the subsequently "laid-off" watermen to plant seed in oyster growing areas and start rebuilding historic oyster reefs.\footnote{Baker to Reilly, pg. 1.}

Their program for oyster restoration reflects the plan that they brought to the rockfish restoration effort which has been their biggest victory to date. The unrestricted fishing of the 1950's, 60's, and 70's virtually decimated rockfish populations, and this crippling blow not only hurt the rockfish and its ecosystem, but it also cost the East Coast 7,500 jobs and $220 million dollars.\footnote{Horton, pg. 107.} In 1984 a moratorium was put into effect on harvesting rockfish. Since then the rockfish populations have returned to semi-healthy levels,
although some are still hesitant to claim that the population has been completely restored.\textsuperscript{101}

Even so, the Foundation admits that restoring oysters is a longer shot than it was for the rockfish. The shad population, for example, has not been rebuilt to any significant degree, and there has been no fishing of shad allowed for over ten years.\textsuperscript{102} This, it seems, would not bode well for the oyster, because as many point out, the oysters are not just suffering from overfishing; they are being attacked by two deadly and uncontrollable diseases as well.\textsuperscript{103}

\textsuperscript{101} Horton, pg. 110.  
\textsuperscript{102} Horton, pg. 110.  
\textsuperscript{103} Conference proceedings, October 1991.
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**KEY**

Participants = participants of the oyster debate as of February 1992 (when I speak of planters, watermen, and others of the oyster industry, I speak only of those present at the October 1991 conference. I am sure these are not the views of all of those in the industry.

Position on Introduction = what each participant's view is on the proposed introduction of the C. gigas oyster to the Chesapeake Bay

Primary Priority = what concern (ecological, economic, or traditional) each participant views as the most crucial to consider in solving the oyster problem.

Secondary Priority = what concern (ecological, economic, traditional) each participants views as important, but as secondary to their primary concern.

Proposed Solution = what solution each participants believes should be implemented.

**Figure 1. A Summary of the Positions of the Participants**
II. Perceptions of and Reactions to the Issues by Debate Participants

Representatives of the industry seem to agree with this dismal prognosis of the oyster’s condition, and yet as a whole, they hold very different views on what the best solution will be. This is a curious inconsistency, one which I believe is rooted in the fact that these representatives have differing conceptions of the Bay itself, conceptions which are results of the kind of oystering they do individually. Basically, there are two kinds of oystermen, planters and watermen, and the difference between them is, in its simplest form, whether they oyster on private or public grounds. Watermen oyster off public grounds, they use traditional methods of harvesting such as tonging, which date back to the Bay’s oysterling prime in the 1890’s, and as such they, in a sense, rely on Nature to provide them with oysters to harvest. Planters, on the other hand, lease portions of the Bay’s bottom from the state, then they buy oyster seed, plant that seed in their oyster beds, and then harvest those oysters once they are grown. Watermen are like cowboys, as one policy maker said, and this is because they lead one of the "freest" lives still available to twentieth century people; they are not restricted in lifestyle or reliant on big companies in order to conduct this lifestyle. This is not the case for the planters.

104 Santopietro & Shabman, pg. 10.
105 As a note, the state government has designated only certain areas of the Bay as leasing areas.
however, who buy their seed from biological facilities and lease land from the government. From the planters perspective, oystering is entirely a human-run affair; there is no reliance on Nature for anything except growth of the oysters.

As times have gotten hard for the oyster, and consequently for the beloved watermen and the planters, the government has intervened more and more to keep both the oyster and those who depend upon it afloat. Therefore, in Maryland, where the public grounds fishery, i.e. that of the watermen, dominates, the state now plants seed and shell in historical oyster grounds so that the watermen might have something to harvest.\textsuperscript{106} Virginia also plants seed and shell, but on a smaller scale because of their largely private grounds oyster industry.\textsuperscript{107} With this involvement of the government, the idea that the watermen lives a traditional life, independent of big business and government is a myth. Even so, government involvement to the watermen is a more distant affair, and as a result, watermen still believe that they are dependent upon Nature, not human beings.

This perceptual difference in dependency between watermen and planters is the key to their opposing conceptions of the Bay. Watermen, as one might imagine, see the Bay as its own vital, active ecosystem; it is something that "shouldn't be messed with",\textsuperscript{108}

\textsuperscript{106} Santopietro & Shabman, pg. 8.  
\textsuperscript{107} ibid.  
\textsuperscript{108} Brancher, personal interview.
because it is more powerful than human beings. It is, they believe, deeply affected by human intervention, and in ways that are beyond human control. Planters, on the other hand, see themselves as farmers, and, likewise, they see the Bay as a farmland. On a farm, it is not a problem to introduce a new strain of corn or cut down a grove of trees. Similarly, introducing a new species of oyster or changing the structure of the bottom of the Bay is not problematic. To planters, then, the Bay is a much more passive entity than it is to watermen, and it does not react negatively to human intervention. Planters cite as evidence of this the fact that planters can and do intervene by planting seed, planting shell, and the result is the same each time in that the oysters will continuously grow and flourish (until, that is, they are struck by the diseases MSX and Dermo).

Even so, watermen and planters are united in their opposition to the CBF's proposed moratorium. They all contend that with or without a moratorium, the oysters are going to continue to die, because of the lethal diseases MSX and Dermo.\textsuperscript{109} This is not necessarily true, the Foundation and now the Virginia Institute of Marine Science both point out, because without the stress of harvesting, the oyster might be able to rebound. Of the two stresses on the oyster, disease and harvesting, there is no evidence that one or the other is the most devastating to oyster populations, because with constant harvesting, year in and year out, the oysters have never had a chance to build up

\textsuperscript{109} Simms and Cowart and Maryland packer, conf proc, pg. 5, 11, & 12.
a resistance to the disease.\footnote{110} Oystermen know this, although they do not necessarily agree that it is a significant factor in the decline of the oyster population. Even so, their united opposition indicates more than a different interpretation of scientific evidence; it indicates the conceptual claim that there is an absolute separation between themselves as human beings and Nature, i.e. the Bay. They do not, in other words, believe that what is good for the oyster will necessarily be good for them. As this is the case, oystermen furthermore hold that their concerns are unarguably superior to those of the oyster. As President of the Maryland Watermen's Association said at the October conference:

> the environmentalists get on their bandwagon saying, "save the oyster for the watermen" ... they use the watermen to get what they want and to do their research and then they forget about [watermen] in the process. They are carried away with saving the species; they lose sight of the fact that people is what it's all about.\footnote{111}

In this statement, this watermen feels that his concerns must be defended as if they were in competition, not just opposition, with those of the oyster.

Although this attitude is perhaps obvious or predictable from an industrial concern, to a Green it is by no means necessary. If one will recall, Greens believe that if one's ethical system was inherently biocentric rather than anthropocentric, one would not

\footnote{110} VIMS statement & Goldsborough, 2nd interview. \footnote{111} Conference proceedings, pg. 5.
approach Nature from a perspective of "us" (humans) against "them" (other living organisms). Rather, the concerns of both would be seen as being different yet inextricably interwoven.

The perceptual differences between the types of oystermen is important in yet another way. Because the public grounds fishery is stressed in Maryland while the private is in Virginia, there is a regional as well as an industrial basis for perceptual differences and thereby differences in attitudes towards the proposed solutions as well. In other words, those of the oyster industry in Maryland (not only oystermen, but packers and shuckers) are inclined to reject an introduction on the grounds that it could have extremely devastating effects on the Bay's delicate ecosystem, while those in Virginia are more inclined to consider the introduction of a foreign species to be a viable option.

One could refute the claim that the differences are primarily perceptual in nature by pointing out that they could, rather, be geographical. Maryland could be against the idea because their oyster and their industry are not in as desperate straits as Virginia's are because the upper Bay, Maryland's half, has lower salinity waters. This, however, is not an entirely satisfying reason for Maryland's greater reluctance, because, as a packer from Maryland said at the October conference:

I feel like Virginia, because my plant only has twelve shuckers now and whether there're oysters or not, I'm not
going to be able to stay in business . . . I think you should tread very slowly even though Virginia has so large a problem . . . What damage could this do to the hard and soft shell crabs? I think you should keep things the same in Maryland. Even if I were Virginia, I would make sure I had all the answers before I did anything, even if it spelled disaster. And I do feel like I'm in as desperate a situation as Virginia, but I think we should go very slowly with this.\footnote{112}

As such, even with those who face "do or die" situations, there is a climate of caution and fear of other reprisals in Maryland which is certainly existent but is not as evident in the Virginia element.

In my research, this latter point was most evident in governmental responses to the oyster situation, in that Maryland's governmental officials constantly asserted the need for extreme caution in deciding how to intervene in the Bay's ecosystem. These responses, however, are much less likely to be characterizable in terms of official's perceptions of the Bay. Basically, at the October conference government officials of both Maryland and Virginia gave statements which reflected more than anything the feeling amongst their constituents in industry. Indeed, this is logical because on the basis of this decision, they will gain or lose votes on this issue mainly from this element of society. This was exacerbated at the conference by the common unwillingness of scientists to get involved in the issues as well as the science of the debate. Most scientists were willing to say that action is needed to solve the

\footnote{112 Maryland packer, conf proc, pg. 12.}
problem immediately, and some were willing to state their opinions on what should be done. Even in this case, however, scientists continuously denied responsibility for their opinions, saying they would only be responsible for their facts, and they constantly reminded officials and others that they were involved in the debate only as scientists and would not be affected by how the issue was resolved. At the time of this conference, furthermore, the environmental contingency, the CBF, was also not very influential in the eyes of the other participants.

Traditionally, the oyster industry is very powerful in these debates, and thereby the cautiousness and resistance of Maryland's watermen-dominated fishery is reflected in the state government position. In October the state of Maryland recommended more research, better management practices. One official of Maryland's Department of Natural Resources said, for instance, that the state has been releasing seed and then planting shells, but these activities have not been coordinated well, so that the shell has been planted at the wrong time or in the wrong area, making it impossible for the seed to set on these shells. This is essentially wasted time, effort, and money. Maryland officials hold that with better co-ordination of these activities, perhaps the oyster population would stabilize or even rebound.\footnote{Jensen, telephone interview.} Virginian government officials, conversely, made statements at the conference which were filled with a sense of
urgency, feeling better intervention practices alone would not be enough. Virginians feel that if they want to have any oyster industry at all, or any oyster, then they must decide on a solution of positive action immediately.

Even as these government agencies and officials base their judgements on the concerns of their constituents, they also seem to be influenced by industry's perceptions of the Bay. One Virginia official, for instance, stated in a private interview that he believes that one can change an ecosystem in water as much as one can on land, i.e. the Bay is very much a farmland. As such, the Bay, like the land, can be used as farmland, developed for business use or whatever without a significant problem. A Maryland official, one who is similarly positioned in the Maryland Department of Natural Resources to the above Virginia official, stated the opposite view: "we need to save everything we can. Since it was there then, we need it now. Like Aldo Leopold said, 'the first rule of intelligent tinkering is to save all the parts'." Importantly, "saving all the parts" means saving the original parts, i.e. the native oyster. Maryland officials, in short, stressed how little was known about the functioning of the Bay's ecosystem and effects human action has on it, while Virginia officials acknowledged this, but then claimed they now had nothing to lose.

115 Brancher, telephone interview.
Significantly, this latter statement was made in conjunction with a support for introducing or at least testing the C. gigas oyster in bay waters. This statement was not made in conjunction with support for a moratorium or even with further restricted fishing. In other words, the concerns of the oyster were considered only to the extent to which they were relevant to solving the monumental problems of the industry. Again, there is an assumed intrinsic separation of humans and Nature in that no one considers that what is best for the native oyster would be best for the oystermen as well.

In response, one such participant might mention, as many did, the fact that the market for oysters might be gone by the time the oyster recovers, not to mention that all the packing and shucking houses would be out of business. The problem, however, is that there is no guarantee or even a probability that the case would be different if gigas was introduced. As one Virginia official said (the same one, in fact, that supported introducing gigas because Virginia has nothing to lose), it would be five to ten years before the population would come back at high enough levels to support a thriving industry, and that is assuming an optimumly successful set (introduction) of the gigas oyster.

A different voice in this political wilderness is that of the recent institutional statement from Virginia's main scientific research facility, VIMS. The document from VIMS, which was a collaborative
effort on the part of all of main scientists from VIMS who have been involved in research on this issue, claimed that overharvesting has been the main cause for the oyster’s decline in the twentieth century. Connected with this was the claim that a "large and significant body of literature" asserts their position.116 As a conclusion from this, then, they said that "VIMS takes the position that continued exploitation of the public fishery is unwise in the present circumstances".117 Basically, albeit in very careful language, VIMS supports a moratorium. In defense of this they cite protecting the resource, the already badly outmarketed and outcompeted Virginia industry, and its probable slow recovery. They stress that promoting harvest in the face of little information on the rate of disease-induced mortality, along with advocating a policy of overharvest before disease strikes "spells disaster for both the organism and the industry".118

Significantly, the VIMS statement draws an analogy between the management strategy for the oyster and bad economic strategy: "we have spent both principle and interest to the point that the resource is in collapse".119 In a private interview, one VIMS scientist expressed this same view. He said that with overfishing being the main cause of decline, if the oyster is given the chance to recover, it

116 VIMS position statement, pg. 1.
117 ibid.
118 ibid.
119 ibid.
will, even in the face of two major diseases. By virtue of this, he stated two main concerns: that the oyster be given the chance to recover, and that, simultaneously, the management of the public fishery be reevaluated so that the amount of fishing permitted matches the number of oyster that exist to be harvested.¹²⁰ Contrary to this, many more oysters can presently be harvested than actually exist.

This is by no means the view of all at VIMS, however, and one other prominent VIMS scientist actually holds the exact opposite view. He believes the Bay is no different than a farmland now, with all of the human-induced changes that have occurred in the past hundred years, and as such the introduction of a foreign species is no different than introducing a new strain of corn to a field in Kansas. Even more strongly, in October he said, "the oysters are irrevocably changed, the estuary is badly mauled. The oyster is no longer living in its natural environment. They're living in a New Jersey dumpsite, not a pristine estuary".¹²¹ He seems to believe that many in this debate are approaching the oyster problem emotionally rather than scientifically; they are basing their reasoning on the symbolic meaning of the Bay and their emotional attachment to the Bay (which he does not have, since he is not a native of the Chesapeake Bay area).

¹²⁰ Hargis, telephone interview.
¹²¹ Mann, personal interview.
One Maryland scientist agrees with this latter statement, saying that the traditional symbolism of the oyster is a part of its importance, but, he says, this is weak as the only reason to save the oyster. A stronger reason to save the oyster in his view is its ecological value. To this extent, he says that the oyster is important in that (as many say) the oyster is reef-forming and it filters the water and as such it is the cornerstone of the Bay’s benthic community. Interestingly, this scientist did not grant the oyster any economic importance at this time in history.\textsuperscript{122}

Another Maryland scientist, by far the most openly environmentally-minded of any at the October conference, believes that enough material and information has been gathered to proceed. He stressed both the ecological and the economic urgency of the issue, and that a full decision would include an immediate plan of action, an environmental impact assessment on the gigas oyster in bay waters, and a constant consideration of the urgency of the plight of the oystermen.\textsuperscript{123}

Another point that many scientists in Virginia stress is that the state of Virginia manages the Bay, but citizens of Virginia are the ones who actually own it. Here, then, along with a view of the Bay based on its existence as a complex, dynamic ecosystem, there is the further belief that, in a sense, all Virginians are responsible for,

\textsuperscript{122} Leonard, personal interview.
\textsuperscript{123} Krantz, conf proc, pg. 9.
are "stewards" for, the Bay. As a whole, scientists of both Maryland and Virginia seem to agree that the oyster is crucial to the Bay's ecosystem, and that management strategies need to be radically reevaluated so that the industry is harvesting at a sustainable level.¹²⁴

This, too, is the goal of the CBF, although their main focus is proper management as well as restoration. In total, they want to "save the Bay", and an integral part of this process is restoring the crucial benthic community,¹²⁵ which, in turn, makes restoring the oyster population a priority. They have, therefore, been heavily involved in this debate. They were the first to recommend a moratorium, their main reasoning being that it would be the best thing for the oyster itself. Faced with arguments such as Simns', that it is "people that it's all about",¹²⁶ the CBF tries to argue that what is best for the oyster is ultimately what is best for people as well. The Foundation also argues that it represents the resource, "independent of any sort of interest [such as financial interest] in the resource".¹²⁷ They, like the watermen and some of the scientists, see the Bay as a dynamic, complex ecosystem which is historically delicately balanced by the organisms that live in its waters.

¹²⁴ VIMS position statement, pg. 1.
¹²⁵ The benthic community is the community of organisms that live on the bottom of the Bay.
¹²⁶ see footnote 110.
¹²⁷ Goldsborough, telephone interview (1).
Significantly, they say that they do not want to "save the Bay" for itself or for themselves; rather, they want to save it for people and for what people value in the Bay. Even so, the Foundation would like to see those values, as they have traditionally been, changed. Rather than emphasizing the "dockside", economic value as well as the symbolic value of the oyster, the Foundation would like to see the ecological value become the focus of debate and of decision-making.

The CBF also stressed the fact that science knows very little about the inner workings of ecosystems and what ultimate effect random human intervention has on them. Furthermore, what is known is rarely positive. In the case of artificial introductions of C. gigas, in about half the introductions serious to even severe repercussions were impressed upon the whole ecosystem as well as upon the oyster.

Gaining support in this debate, however, has been an arduous process for the CBF. Historically, the industry holds the most political clout, and although the Foundation is always working to carve its own political niche, such a process, by the Foundation's own

\[128\] ibid.
\[129\] ibid.
acknowledgement, takes a long time.\textsuperscript{131} In this debate, the delegation of political power has followed this traditional path; as the Foundation's representative describes it:

[the CBF's proposal has] not [been received] well at all, that's a mild way of putting it. Watermen are upset, agencies in Maryland and Virginia have rejected it. Their policy is a reflection of the [oystermen], the user groups.\textsuperscript{132}

Nothing changed in this situation through the end of 1991, in that until recently, the Foundation knew of no group or even individual who supported the same course of action that it did. With VIMS' January 1992 position statement, however, there is a ray of hope for the CBF.

The Foundation is not the only group frustrated by government inattention. Scientists, too, often make the same complaint. In one ViMS publication called, "Research, Education, and Proper Extension work: the first 50 years of the Virginia Institute of Marine Science", the writer, a prominent ViMS scientist involved in the oyster debate, says:

acquiring scientific information and then persuading managers and the public to use it effectively is like rowing a boat upstream at three knots against a five-knot current. We have made some progress in solving the problems of our marine resources and environment. Yet with the lethargic pace at which governments try to solve resource and environmental problems, it seems

\textsuperscript{131} Goldsborough, telephone interview (2).
\textsuperscript{132} Ibid.
that society is destined not to catch up, get ahead, or win.\textsuperscript{133}

Other individual scientists, of both Maryland and Virginia institutions, make similar complaints with similar gloomy predictions. Perhaps with the current urgency of the oyster problem in Virginia, baywide government agencies will be forced to act quickly.

\textsuperscript{133} Hargis, William. "Research, Education, and Proper ExtensionWork: the first fifty Years of the Virginia Institute of Marine Science" (VIMS publication, 1990), pg. 23.
Conclusion

Certainly a prompt, considered decision would benefit all of the interests in this debate, human and non-human. A Green, I believe, would have to agree, even though a decision would likely be based on traditionalist reasoning as none of these interested parties are strictly Green, and in fact most of them are composed of fairly hard-core traditionalists.

The CBF seems to believe that it is not necessary to be a die-hard Green to be environmentally orientated, politically and philosophically. The Foundation has a moderate approach; as an organization, it does not consider itself to be Green, nor does it consider itself to be reformist in merely trying to make environmental policy changes. Its main goals are to restore the Bay and then ensure the Bay's long-term maintenance. Its strategy is threefold: environmental defense, watershed protection, and environmental education.\(^{134}\)

The Foundation's approach to these three is what separates them from both reformists and Greens. When asked about concepts such

\(^{134}\) Nov 1991, CBF publication.
as intrinsic value of species, the two representatives of the CBF whom I interviewed told me that "we [at the CBF] go with pragmatics, not philosophy"\(^{135}\) because "there's not much percentage in it [Green philosophy]" and "a real world environmental group can't make policy with that".\(^{136}\) They believe that endorsing such conceptions is too far-fetched and intuitively counter to the beliefs and practices of its members, not to mention that such philosophies would probably be suicidal in public policy forums. As one member of the CBF staff says in reference to intrinsic value of species:

\[
\ldots \text{some of the environmentalists and animal rights people say it's just not right to kill ducks and torture fish with hooks. Frankly, the older I get, the less inclined I am to kill, but I tell animal rightsers that, practically speaking, there are a lot of people who will save the Bay so that they can fish \ldots in the Bay. If the Foundation took their stand, they'd lose a lot of membership.}^{137}\]

Even so, the most recent book on the Chesapeake Bay to come from the Foundation, called *Turning the Tide* by Tom Horton, includes a section on the need for an environmental ethic. Just as those of the Green approach, the Foundation relies on ecological concepts and approaches to provide them with a workable goal for the Bay and its people. Members of the Foundation speak of minimizing consumption and of reaching a sustainable level of consumption and development. Here "stability" and restoring "balance" in the system (the Bay and

\(^{135}\) Goldsborough, telephone interview (2).
\(^{137}\) ibid.

70
its watershed) are key.\textsuperscript{138} They believe that this would not just maintain people's long-term quality of life, but will do so even in the short-term.\textsuperscript{139} The June 1991 \textit{CBF News} publication, incidentally, included a blurb from the section on environmental ethics in \textit{Turning the Tide}. At one point, Horton writes:

> although we cannot preserve Chesapeake Bay for future generations without laws, and regulations, all the legislation we could imagine will not be enough without an ethic that defines an enduring and nurturing relationship between humans and their environment. Nor are we likely to get to such a point without a massive commitment to education.\textsuperscript{140}

One obvious element from this passage is the belief that people are a part of Nature and need to act as such in order to preserve their quality of life, as well as to preserve the Bay. There needs to be, then, a co-operative spirit in addressing issues involving the Bay: as one said, "in all but the shortest term, what's best for the environment is best for humans economically".\textsuperscript{141} In this, in the Foundation's desire to replace what they call the "environment versus economics" argument, the same kind of harmony with Nature is being expressed as is by Greens.

\textsuperscript{138} ibid.
\textsuperscript{139} ibid.
\textsuperscript{140} \textit{CBF News}, June 1991, pg. 8.
\textsuperscript{141} Horton, interview.
The attitude of the industry consituency is unmistakably counter to this, and industry representatives draw a hard and fast line between themselves as human beings and the natural world, specifically the Bay and the oyster. There is, perhaps, an interesting explanation for this. In the course of this debate, two reasons for saving the oyster have been stressed, and they are ecological and economic in character. It is "save the Bay" and "save the watermen". All oystermen are acutely aware of this, and, as they believe that what is good for the oyster is not necessarily good for them, they view their interests to be in competition with those of the oyster. Oystermen, therefore, work hard to ensure the safety of their interests, vehemently and repeatedly rejecting proposals of moratoriums or introductions (in those cases where they see that as threatening).

It is not, as Greens have said, necessary for humans and Nature to be in competition with one another; in this case, it is not necessary that oystermen see themselves to be in competition with the oyster. Furthermore it would be a great benefit to both the oystermen and the oyster in the long run and in very tangible ways if the oystermen’s sense of competition did not exist. Instead of competing interests, then, the jointly concerned economic and ecological interests could work in conjunction with government agencies and the scientific community to hash out a solution which would accommodate both interests to the greatest degree possible. In
cases where the interests of Nature and humans were radically
diverse and opposed, then different perspectives and as much
information as possible would need to be introduced. It is important
to realize, however, that in a world where people perceived
themselves and Nature to have co-operative interests rather than
competitive interests even this situation would not, ideally, be a
threatening one for any of those concerned.

To explain this more completely, imagine a business meeting, for
example, where the advertising and financial branches of the
company are trying to hash out a plan which will reduce the amount
of money spent on advertising to relieve the budget deficit of the
past year. In the room are a few of the company's highest
executives, a representative from the finance department, one from
the advertising division, and a few outside "experts". During the
meeting, the advertising representative claims that the plans they
have for the year are extremely important if the company is to
maintain its market; the accountant from the finance department
claims that they cannot afford to allot as much money to advertising
this year; the experts give several different (not necessarily
opposing) evaluations; and the executives listen, asking clarifying
questions here and there. At one point, the budget and advertising
representatives begin to debate the issue heatedly, becoming
defensive. One of the executives, at that point, would conceivably
say something like, "wait a minute. We all work for the same
company, and as such we all ultimately represent the same interests. What we need to accomplish in this meeting is a co-operative agreement, and I realize that neither of your divisions are going to get exactly what you want, but you need to realize that what is most important is not that your department benefit the most, but that the company benefits the most.

This is the perspective that would be most beneficial in issues concerning the Bay and its watermen. Just as the advertiser represents the oystermen, the accountant represents the oyster's defender, the CBF, the experts represent the scientists, and the executives represent the government officials, the company itself, most importantly, represents the future of the Bay. Ensuring the future of the Bay ensures both the future of the oyster and the future of the oystermen. This is what will indefinitely preserve not only their jobs, but their way of life.

Perhaps, then, what is good for the oyster will not necessarily be good for the oystermen in the short term, but if the oystermen could realize that they "work for the same company" as the oyster, then the divergence between the interests of the oysters and the interests of themselves would be a challenge but not a hostile threat.
This would, of course, demand the same attitude from other participants in order for it to be successful. Government officials, in particular, would also need to adopt this attitude. As it is, they do not, and they thereby hold to a strict traditionalist view in which oysters have value only insofar as they are useful to the citizens. In a sense, adopting a view in which the central concern is something non-human is impossible for government representatives, because their central concern is the interests of their constituencies, their voters, and oysters, frankly speaking, do not vote.

Then again, neither do children, and yet state and federal governments feel obligated to protect them, because they are future voters and because they are human beings. Perhaps the latter of these two reasons is the stronger one, however, because as children, they have no vote and therefore no active control over their concerns or representation; it is only through the voters that their concerns are made important in the eyes of state and federal governments. It is only through the voters that children are even given an "intrinsic value" such as in child labor laws and child welfare laws. In this sense, then, the cases of children and oysters are similar, and Nature can be given rights in this same way. Oysters, then, can be granted "rights" as well.

Although most of the participants would scoff at this notion, they do attribute value to Nature in a way which is not what Green would
call traditionalist. Namely, nearly all participants of the oyster debate believe that the Bay itself has intrinsic value. No one directly states this, but whenever the effort to restore the Bay is defended by the CBF or the government or others, the "traditional" and "symbolic" value of the Bay is cited. The oyster is said to be important insofar as it is important to the Bay in that the Bay has been a part of the people's lives. This is granting the Bay a value in and of itself. Even for the Bay to have traditional value it has value in and of itself, for people are not valuing it simply for what they or another person can get out of it. They are valuing it for itself, because it exists and is beautiful and has life within it. Many of the people living around the Chesapeake Bay have grown up on it, they have found fun and simple pleasure on and in it, and it has been a place of beauty in their world. This is reminiscent of Leopold's ethic in that they are attributing value, integrity, and beauty to the biotic community. As people living on and around the Bay have realized that their actions and consumption, individual and collective, are destroying the Bay, this intrinsic value attributed to the Bay has spurred them to act. Predictably, many want to keep the Bay the same without changing their habits, such as some boaters who do not want to limit boating or act environmentally consciously when they are on the Bay. This is, perhaps, a case of Aldo Leopold's "obligation without conscience".142 Even so, many people living on

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142 see chapter 1.
and around the Bay do seem to value the Bay for itself, not just for what they get out of it in terms of fishing, sailing, or income.

The same kind of intrinsic value is attributed to the Bay's industry and its watermen. During the October conference, one scientist questioned this, asking why we needed an oyster industry at all. In response to his question, a Maryland government official commented that the question seemed "strange, because everyone was assuming we do". Interestingly, no one ever really answered the question.143

Another interesting aspect of this debate and the way its participants approached the issues is that ecological metaphors and systemic thinking were used throughout. One industry representative, a planter from Maryland, said:

the important question here is not whether we should have gigas or virginica. Are we going to take care of the necessary social changes that will be needed to have a good oyster industry again? This year the DNR [Maryland Department of Natural Resources] sold 1,000 licenses. Each of these can catch 15 bushels of oysters a day, and they have 100 days to fish. Well, anyone can add that up and see that they're allowed to take out 1.5 million bushels, when we only have 400,000 bushels that we can get. And then when you ask the DNR, they say they don't know how much it will take to replenish the stocks. If I, as a farmer, said this and then authorized taking out three times what I could produce, I'd be gone. As a farmer, I know that I can only harvest what I plant, and if there's no planting there's nothing to harvest.

143 Conference proceedings, pg. 11.
If this is the same managing program you'd use for gigas, too, don't worry about it because you're not going to have an industry... What is the importance of the watermen? We're talking about the jobs of 1000 people. Recently I read that they're laying off 1500 people from some part of the government. I didn't hear anyone screaming about that. So what we have here is a social problem... if you want to introduce gigas, go ahead, but make sure you also make the necessary social changes or you're wasting your time.\footnote{Conference proceedings, pg. 11-12.}

This planter's main point, which is common sensical and yet often, as he says, completely missed by decision-making agencies, is that neither the ecological nor even economic problems can be solved by addressing the issue in one way or the other, ecologically or economically. In the case of the introduction, participants are attempting to solve the problem by looking at the ecological and economic aspects of the problem separately. As he says, however, the "social problems", the managerial problems and issues of tradition and value must be addressed at the same time that ecological issues are discussed.

The only participants who did not seem to think systemically were the economists. In interviews and at the conference, they were the only ones to speak of "quantifying" values, and it was an economist who asked why the industry was important. Here, then, is evidence that the kind of science one is doing or appealing to in approaching issues actually has a direct correlation to how one thinks about those issues. This, it would seem, bodes well for ambitious Greens.
With the promotion of ecology as an important science, perhaps if Greens succeed and ecology becomes more and more prominent, the way people think about their world will change as well.

For the purposes of this study, then, the Green alternative has proven to be a productive and insightful aid to solving environmental problems. As for the Chesapeake Bay and its oyster, it seems that a co-operative spirit in such debates amongst human and natural interests is still a future prospect. Even so, it would appear that the foundation for instilling this harmony is present. As the Chesapeake Bay Foundation continues its efforts, as industry sees its concerns intertwined with that of the Bay, and as people approach the issues ecologically as well as managerially, perhaps in the coming decades this basis for change can become a real change towards human harmony with Nature and human understanding of the value of the Earth, as well as one towards a solution to the challenge which the oyster, the watermen, and all those involved in the debate now face.
Appendix A

Proceedings of The Oyster: Ecology and Management Conference
Annapolis, Maryland, October 30-31, 1991

Introduction and Welcome

(1) Pete Jensen

The overall question we have to answer is where does the future of the oyster stocks and of industry lie? Does it lie with native or non-native species? Even if we introduce the gigas, our industries and stocks need attention now and all of the change will not just come about in a decade or so. We have more and more imports as the industry is declining.

(2) Bill Pruitt

The situation in the Bay is horrible. In 1875, VMRC was established to manage both the natural resources and their habitat. We have a nine member commission, with a quasi-judicial role, and we make land decisions as well. VIMS is with the College of William and Mary, and by law, is our scientific advisor. So this is not like Maryland who relies on a whole slew of scientists. We rely on Hargis and Mann. VIMS came to the Commission about one and a half years ago, and said look, we want to introduce this oyster. We had a debate then; an open public hearing. VIMS wanted to put a few in the York river, and we denied their request on the basis that there was not enough information and too much division among the scientific community. and when Maryland and the other states wrote, hey, do not do this. Be very careful. We had a good catch this year. The problem now is that there is no market, the shucking houses are closing down. The secretary of the Natural Resource Commission created the Blue Ribbon Oyster Panel. Have been meeting for the past six months and have one more meeting. They will submit their reports and recommendations to the VMRC. Reports from this
Conference will also be submitted to the VMRC and they will decide. As you know, VIMS, no one, has the authority to introduce the gigas right now. Personally, I appreciate all of this. Many livelihoods and future generations depend on it. The oyster industry in Maryland and Virginia is a way of life. The burden is no longer just on the scientists. The managers, too, must bite the bullet. We need the managers to step in.

(2) James McVey: National Sea Grant College Program, NOAA

In the program, I am the director for aquaculture. The industry where there once was one is virtually nonexistent. There have been two meetings previous to now. Md. DNR, VMRC N Sea Grant, National Fishery Programs, National Coastal Resource Institute, USDA regional aquaculture centers. We have lots of good resources, but we are having trouble focusing. If we were able to focus, we could solve this problem. No matter what is going to happen, the industry is going to change either i. Into oblivion, with no oyster at all or 2. we will use and develop new technologies to grow and to manage oysters.

a. We have the triploid oyster: grows faster, is sterile, is good in the warmer waters
b. off-bottom growth-- no content with the other diseases.
c. genetic strains
d. does have the resistance to MSX, but do have for Dermo.

there must be a change in the marketing for the oyster, there is no public confidence that an oyster can be eaten safely. So the involvement of the social scientists is needed here. Need to certify to the public that it is safe. We need to think about how to train people to do the new oyster farming and fishing. Need new processing. Need to know better the impact of the oyster on the water quality. How to use our technology, develop new technology to solve the problem.

SUMMARY OF THE PREVIOUS MEETINGS

(1) Dr. Carl Sindersman, Oxford Marine Laboratory, NMFS, NOAA

From the scientists point of view, we have explored in grat detail the matter in hand, the resources, and the introduction of the gigas. We have looked at the issue from a number of different
disciplines and institutions. In the meeting held in December of 1989, we met to discuss the social, political, economic, and marketing issues for any decision regarding the rehabilitation of the American oyster industry. We had several working groups, one led by an economist, one by a sociologist, one by a resource manager, one biologist. At the end they drew up this general agreement:

1. We need a complete profile of the U.S. oyster industry (political, economic, marketing, technical, social, legal problems, etc., and look at the negative and positive aspects.)

2. Data developed from this needs to be used as the foundation for a cost-benefit analysis of restoring the industry.
   a. Preservation of a way of life vs. b. cost of the public hatcheries and the management.

3. Need an institutional framework for this new modified oyster
   a. the national level to plan and evaluate the kind of research to be conducted.
   b. The option versus the public versus the private growing areas needs to be looked at.
   c. The consideration of how the industry members are going to figure in

4. the research into the disease resistant strains needs to be done under very strict conditions.

The final decision should be made by the Atlantic Seaboard and Management.

5. short term management needs to be addressed as well

6. Need to explore the relevant social and policy issues that are relevant. For instance, who should manage? How can we best protect the land? What about public versus private aquaculture? What about the safety of consuming the seafood?

All the information produced mandated that the introduction be done with extreme caution. Conservatism was the dominant view of the participants. This meeting was very successful. As a biologist, I have a common narrow focus, and the sea of the other disciplines to flush out the issue was very refreshing.

(2) Dr. Roger Mann VIMS, W&M

The premise of the first workshop was to get a progressive series of proposals. Look at the research from a few years ago. It suffered from an incoherence. So the initial motivation for the
conference was to provide some sort of coherence, with the idea that we shouldn't be so narrow-minded as to look at just biology. Still, the end product was biology. In talking about the Bay, there are really two diseases that we really cannot control. We do not understand them. When the managers do not understand what is going on, it makes them unable to control the stuff, and that makes their life very hard. The oysters have been irrevocably changed by a badly mauled estuarine. We are not looking at a natural situation. So we are dealing with an indigenous species no longer in its natural habitat. We are essentially dealing with a New Jersey dump site, not a pristine estuary. Let's get back to reality. The situation is so grave with respect to the people who are involved in the fisheries. If you look at where we are in the development of our expertise, there is a lot that says how not to do the research. The question is, what is the limited amount of risk. No matter how hard we try, we do not have a good possibility in the next decade. Are we willing to accept this? This is a social decision. As a biologist, I provide the information for the risk assessment. The managers must put the different value sets together. This is the first conference to dedicate so much time and focus to the introduction of the non-native species into the Bay.

(3) Dr. Standish Allen Haskins Shellfish Research Laboratory, Rutgers University

I'll talk about the second meeting sponsored by Rutgers, Va., Maryland, and the Sea Grant program. The overall considerations are as such: On the biological side, we have to consider the disease, the ecology, and the genetics. On the non-biological side, we have to look at the social, political, and economic side. The recommendations are as follows:

1. Options with the virginica should be explored fully
2. Evaluation of the gigas should continue with care and conservation
3. The gigas field evaluations should be done with the triploids because they are sterile.
4. We can rule out the possibility of hybrids because they will not form between the gigas and the virginica. We looked at about 800-900 families.
5. The molecular probes for disease organisms and for making the studies is crucial.
6. ICES guidelines should be followed at all times.
7. A final workshop should be given on the ecology.

QUESTIONS
Q: Have an recommendations for the social species been carried out? Who will do this?
A: Sinderman: the general plan is to explore the options, outline the plan of action, and the appropriate research groups are to pick up the ball from there. Should be a cooperative effort.
A: Bill Ritkers from the Va. Sea Grant Program: we have already been talking about another meeting.

STATUS OF THE INDUSTRY

(1) Dr. Ken Chew, School of Fisheries, University of Washington
The west coast is a classic example of the mass introduction of non-native species. At the turn of the century, there was a huge decline in the industry. Why? We don't really know, but we think probably because of over fishing and climate change. The gigas was brought over from Japan, and in the latter 1920's we had the massive introduction of the gigas in order to replenish the oyster stock that had already declined. The oyster fisheries are changing because we are having to supply other regions besides ours now. We have this concept of technology on the west coast: we have remote setting (developing the larvae in hatcheries and shipping them to the farmers, the farmers catch their own seed and do what they want)

(2) East Coast Larry Simns, Maryland Waterman's Association
I am here as watermen do to upset the wagon, or, rather to throw some chalk in the cogs that are turning here. The future of the Bay is with the watermen. We feel abused, and we are not making much money. We have sat on the shore for the past five days because there has been nothing out there. there also has been no market. The price is lowering and we only are allowed to harvest fifteen bags a day. We cannot compete. I wonder what we would do if we had more oysters because we have no market. Well, the public perception is hurting the markets, but, then, if there was more markets, we could create the market. People are afraid to eat raw oysters because of any article at all that talks about any problem
anywhere at all. Scientists etc. jump because they can get grant money, they forget that people are affected. The environmentalists get on their bandwagon saying "save the oyster for the waterman". They create a lot of problems with all of this hype. They use the watermen to get and to do their research and they forget about them ion the process. They are carried away with saving the species. They lose sight of the fact that people is what it is all about. It is a good idea to fight the decline and the pollution but it is bad to put the burden on all of the watermen. We need to stem the population growth and then it will be okay, but that is not going to happen. Therefore, I feel that we need to have most of the research directed at how the population growth is destroying the estuaries. Whatever research you do, make sure that it is done in quarantine. Maryland has a great program. We manage around the disease. We put seed where the Dermo and the MSX are not. They anticipated a big catch in the lower Ba because there was a good hatching, but 90% of it all was dead by the time September had come because of MSX. So what good would a moratorium because they are all going to die anyway. We need you scientists to do research because we don't know what to do, but just be really careful.

William Hargis: Information with the interview stuff

ECOLOGY WORKSHOP SUMMARY

Dr. Victor Kennedy, Horn Point Environmental Laboratory, University of Maryland Center for Environmental and Estuarine Studies.

This is all very interesting because 45 years ago, the national Shellfish Association had proposed a conference for the study of the introduction of the gigas into the east coast. The first workshop was held at VIMS, the second i Annapolis for the socio-economic aspects of this introduction. The third workshop was held at Rutgers to study the genetic effects, and here we have the fourth to focus on the importance of an introduction and the ecological ramifications that it might have. Our objectives here should be to evaluate the effects of the C.gigas around the world. We must also provide an overview of the ecological factors that would effect the introduction of the C. gigas. We must assess the ecological risks and the benefits of a possible introduction. This should not be a pro-
con discussion, rather, we need to discuss the ecology of both the virginica and he gigas. In fact, I am not a proponent of the introduction of the C. gigas. So, we need to discuss what are the ecological requirements? So we need to studiously stay away from any opinions on whether or not we should have the introduction

MORNING PANEL: ECOLOGY WORKSHOP C. GIGAS AND C. VIRGINICA

Dr. Roger Mann: Information with the interviews

Dr. Parameswar Dinamini, consultant, Aquaculture, Wellington, New Zealand, Dr. Phillipe Gouletquer, Chesapeake Biological Laboratory, University of Maryland Center for Environmental and Estuarine Studies, Dr. Peter Ayres, Consultant, fisheries and Aquaculture, New south Wales, Australia. See papers and notebooks for stuff on these guys. Needed them in order to gather all of the potential information and in order to make some kind of good comparisons between the gigas and the virginica.

QUESTIONS
First, Victor K, Kennedy states: Remember, the question here is not whether or not will happen or not, but just what we can say ecologically.
Q: Is it resistant to the freezing in the intertidal reefs? We have a problem with the survival of virginica in this instance.
A: Supan: Yes, one of our scientists inadvertently froze some and they were okay.
Q: What might happen to the Eastern Shore to the very low, shallow systems?
A: Roger: At this point in time, we do not see very large populations of the gigas in the Chincoteague Bay. the small ones do not really like the the combination of high temperature, low salinity. And after all, we should not look at the worst and best scenarios, but at a typical situation.
Q: Research needs to consider the possible transfer of disease to some other shellfish such as the soft shells in the north Are there any chances that diseases would be brought in with the gigas that would affect this?
A: Yes, it is certainly possible. It might reduce the quality or the yield of the mussels.
Q: Can a pathogen for a finfish be brought in? Example: in China, the gigas brought in a disease that killed the gigas and one kind of finfish. So that it seems that even under the ICES guidelines, viruses can be introduced. Farley made this question, also pointing out that viruses are transmitted vertically so that even under the ICES guidelines, one could be transmitted.
Q: What is the possibility of the gigas spreading up and down the coast?
A: Ayres: In NSW, it was carried by the tidal movement, they suppose, but it could have also come by boat. So many mechanism could move it. There is always the possibility. Since the spat are so small, you often do not know that there is a problem until a problem is caused.
Q: Dr. Chew stated that the crosses between the gigas and the virginica were only moderately successful.
A: Dr. Stan Allen answering: Well, there was no genetic confirmation, they went through the larval period and set, but they turned out not to be hybrids. We need proof of everything to believe it.
Q: From Jenson: What length of time are we talking about with people doing these field experiments?
A: Mann: Management agencies need to look at their own local situation and all of their options. My job is to provide information, and, if they need more, to provide it. Essentially, field experiment is an introduction. And even overboard experiments are introductions. We have essentially no time frames. Our limit depends on 1) how much risk are they willing to take? we can do triploids but we cannot guarantee that we have 100% triploids or that viruses have not been introduced. 2) At what point are people willing to take some risks? The body of knowledge continues to grow. In many instances, the split is just an interpretive issue. These are extremely difficult research issues to address, but cannot say that we will be able to solve them in any time frame. We are going to have to 1) look at considered opinions and 2) some of the hard data. Here we have the scientists giving the information and you have people like Jenson and Pruitt with the politicians on their back saying what have you got for us? All this information is interpreted and may all differ. Managers may be really frustrated with my answer, but it is all that I can give to you.
Ayres: Roger has given an extremely honest answer. What do you want to do with the virginica? Do you want to keep it as a museum piece? The virginica just will not disappear. Do you want to maintain the industry based on the c. virginica? Are we doing the right things? Does the cost/benefit outweigh the value of the introduction? If you want an oyster industry, then just introduce it, but you have got to ask some basic questions and answer them or you will just have more meetings, but no advances. If you just want a fishery, forget it bring in the gigas. The virginica is not really going to go away.

Q: What are the ICES guidelines?
   1. Conduct a comprehensive study in the native habitat. That means looking at such things as the ecological, predator, diseases etc.
   2. If nothing strong against, transfer the brood stock to the closed system in a recipient area.
   3. maintain and study the closed system population
   4. develop the brood stock in the closed system
   5. Grow isolated F1 individuals and destroy the original introductions
   6. introduce small lots to natural waters, continue a close study for disease.

   This is to cover ecological as well as genetic and disease. The question is, here, is this adequate? Even if you subscribe to this part, the risk is still not zero. Canadian example.

Dr. George Krantz, Maryland Department of Natural Resources/Oxford Marine Laboratory

These meetings have radically altered my thinking. The most intriguing component is if we bring in the gigas, it is irreversible. We need to think globally, but act locally. I think that we have enough information to proceed to decision making. So, do you want the virginica or not? Do you want the gigas or not? We need a pro-active stance, not a re-active plan. the watermen, processing agencies, managers, legislators need to get together and start deciding. A suggest on doing this sequentially. We need a plan prepared now with all of these multiple components, an environmental impact program with written risk assessment standards. To Mr. Simms, many do not know what he was saying when he said "I am stepping on you toes." What he really was saying, was
"Please help me." We need to discuss all of this before the field experiments. We must have a decision and a commitment on what to do with the gigas and the virginica.

AFTERNOON PANEL: MANAGEMENT ISSUES C. GIGAS AND C. VIRGINNICA
Lipton spoke at this time. Information with the interview stuff.

John Supan: [the idiot from La. Anyway] No one is interested in the gigas in the gulf. I am concerned with the transfer. You need to be careful. I see frustration in the eyes of the oysterman and when they are depressed, they grab at straws, and I repeat, with certainty that no one in Louisiana wants the gigas.

Bill Goldsborough: in interview

Ivar Strand: in interview

Jack Travelstead: in interview

Doug Lipton: in interview

Dr. Brian Rothschild, Chesapeake Biological Laboratory
Us scientists think that we know why the oysters are depleted in Maryland and we think that we know what should be done. we must solve the problem with the virginica oyster before we go to the Japanese oyster. the problem is that there is a depletion because over the past one-hundred years the structure of the reefs has been destroyed so that there is fifty percent of the oyster habitat destroyed, thus the quality of the existing oyster is decreased. If it is destroyed for the virginica, is it alright for the gigas? in the low salinity waters, it is still limited despite the the faster growth. We think that the concerns for the water quality and disease are overrated because the principle cause is the degradation of the oyster reefs. In fact, on the bottom they are possibly more susceptible to diseases and more vulnerable to changes physiologically. Since the beginning of the oyster industry, the oysters have been fished out at too small a size. the population could perhaps be doubled by the increase in the size of the marketable oyster. I have seen almost nothing on the growth rate and the mortality rate. With the small
oysters, there is fewer and fewer females because as they get bigger, they change their sex from male to female, and now there are too many males. What needs to be done? On the technical side, we need to rebuild the oyster habitat. DNR had this program doing just that, but its funding has been curtailed. We need to reinstate this for the long term. We need to have a program on stock assessment (find out the time and the areas that are best in terms of population size, growth, and mortality rate. The traditional method of counting is not accurate so we need a better method. We need to think in connection with the harvesters of the experimental fisheries regime. We have extensive surveys by the DNR fisheries.

REPLY:
Look. We have extensive surveys done by the DNR fisheries. If one waits until the oysters are bigger, then they are all dead. If we wait until they are four inches, then all except two percent of the oysters are done. and that is usually by Dermo.
Q: Joe McKerskey: If we do not have some sort of strategy then the virginica will just disappear. this is a kind of spin-off question from the virginica stuff. The water quality regulations say that we cannot harvest unless we are in drinkable water. Keep this in mind. To Dr. McVey, if we go a route deeper, than sociologically and politically, people are going to be more likely to see the bay as a receptacle. So it'll be more relaxed on the water quality question. Now, to an economic question. the governments of Va., Md., Penn., have all signed an agreement to have a 40% reduction on the controllable nutrients in order to reduce organic carbon--also to reduce the N and P. This will cost about 100 million per annum, and is only going to reduce it by about 3%. So, my question is, what are the grazing capacities of the oyster? Can you just put the 100 million essentially into the oyster and have it give you a higher payoff in terms of reducing the N and P more than 3%? Because then that ecological role lives it another perspective.
A: Ivar: the only research being done on the Bay to answer your question is being done to answer the question of mass balance.
Q: the question really is, why do we need an oyster industry? Lipton A: Jenson: Seems strange, because we all assume that indeed we do. Really the question that this is pointing to is what do you envision as the future of the industry. too bad that they are not here to answer that question. Until the time that we change the laws, we should work to revive the social traditional ways and methods.
Lipton: What I was really trying to get at is that restoring is not a management goal. Is restoring the industry really the best way to go. And why are we doing it? Is it to keep a way of life? and if so, is restoring the industry the best way of doing this? If the point is just keeping the watermen on the waters, is what we are doing the best way of going about this? Are there better ways? Like better crab managing. As an economist interested in policy, thinking like a tax payer, I want this question to be answered.

Jenson: We need to initiate industry paying for what it gets w/out government subsidy. Industry agrees with this goal. But this does not answer your question.

Q: Lake Cowart: Va.

I am a shucker. I own a big company. We cannot operate w/out the resource and as a shucking house, we have been supplementing in order to stay above the water. There are not enough oysters in Md. to shuck and so there has been tremendous pressure from Texas and other Gulf states. Packing houses are going under. There has been a gradual disintegration and this will continue no matter if there is going to be a moratorium or not. In August in the Sounds and on the Potomac, a lot of oysters died because of disease. We would have had a good catch if not for the disease. At this point it is going to take three more years to get back to where we were before this year. We need to take action to see what other species can live in the Bay because ten years from now not is not going to be virginica.

Statement: Rothschild:

Economically, oysters bring a lot of revenue into the state treasury and they would do this a lot more if there were no disease. restaurants, packers, tourists, these are all economic resources and an oyster industry can be demonstrated to be cost effective. What we need is continued evaluation.

Max Chambers: President of the Maryland Aquaculture Association

The important question here is not whether we should have gigas or virginica. Are we going to take care of the necessary social changes that will be needed to have a good oyster industry again? This year the DNR sold 1,000 licenses. Each of these can catch 15 bushels of oysters a day, and they have 100 days to fish. Well, anyone can add that up and see that they're allowed to take out 1.5 million bushels, when we only have 400,000 bushels that we can get. And then when you ask the DNR, they say they don't know how much it will take to replenish the stocks. If I, as a farmer, said this and
then authorized taking out 3 times what I could produce, I'd be gone. As a farmer I know I can only harvest what I plant, and if there's no planting, there's nothing to harvest.

If this is the same managing program you'd use for gigas, too, don't worry about it because you're not going to have an industry.

What is the importance of the watermen? Were talking about the jobs of 1000 people. Recently I read that they're laying off 1500 people from some part of government. I didn't hear anyone screaming about that. So what we have here is a social problem. These decisions are hard to make. I'm sure if my neighbors heard me say this, they'd hate me. But then they say to me, Max, you're going under. And then I look at them and see they're not doing any better.

If you want to introduce gigas, go ahead, but make sure you also make the necessary social changes or you're wasting your time.

Lipton's question was a good one. Here we are, with the government subsidizing a fishing program, putting in $3-6 million dollars a year for 1000 people to fish. If you think catching a few animals a day makes a big difference in their income, look again. You get $ a bushel and you can get 15 bushels per day for 100 days -- that's not a lot. And even this is done with the government moving the seed and planting the seed in the areas. This is aquaculture. If you want natural oyster bars, let the oysters go and see where they set. But if you're going to be doing aquaculture, we may as well go out of business because we're private farmers and we can't compete.

MD Packer: I feel like Virginia, because my plant only has 12 shuckers now and whether they're oysters or not, I'm not going to be able to stay in business. If you do introduce gigas, have to think of what is best? Will there be processors? How will you handle this? So there's a lot to think about besides whether gigas should be introduced or not.

What damage might this do to the hard and soft shell crabs? I think you should tread very slowly even though Virginia has so large a problem. The public and private domain work hand in hand -- I think you should keep things the same in Maryland. Even if I were Virginia, I would make sure I had all the answers before I did anything, even if it spelled disaster. And I do feel like I'm in as desperate a situation as Virginia, but I think we should go very slowly with this.

Q: Will the states make a unilateral decision? (Dave)
A: (Travelstead) It's possible that the Mid-Atlantic States Fisheries Commission will become more involved. This will give comments from other states on why a state would not introduce another species. Even here, though, the ASMFC's influence is only through unanimity and peer pressure, so to speak.

Q: What is the connection between tourism and economics in Maryland?
A: (Lipton) There isn't really any, except maybe in the interest in skipjacks.

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