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Chaos in Fisheries Management

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What's the Problem?

In the current process of coping with the crisis in marine fishery resources, the United States has developed a management technique centered around the creation of eight regional fishery management councils whose primary function is to produce plans for both protecting and enhancing utilization of marine resources.[1] A portion of council positions is filled by individuals whose membership is mandated (e.g., the director of fisheries for each constituent state); other members are selected for fixed terms on the basis of their expertise or working knowledge. Despite regional variation, however,[2] members of the councils are predominantly drawn from, on the one hand, public sector personnel (e.g., administrators, scientists, technicians) and, on the other hand, the user groups – particularly members of the commercial fishing industry.[3]

The currently dominant model of public policy theory is that such diverse groups bring to the negotiating table a diverse range of goals combined with special knowledge and practical expertise, the result of which will be consensual management programs with which "most people can live most of the time." In the case of fisheries management, the process is expected to be capable of producing plans that balance long term conservation of the stocks with optimal economic utilization of the resources.

The context within which the councils operate requires members to recognize political, economic, sociocultural, and biological forces in play. In brief, during the past three decades, the market forces of consumer popularity, technology, and an expansion in the human predator population have combined to increase inroads on the stocks – which, in turn, has led not just to lower landings but, more critically from the biologists' perspective, annual catch statistics indicating an ominous emphasis on single (and younger) year classes. The difficulties of both management and stock maintenance per se are compounded by such additional factors as: (1) the expansion in the number of targeted species which results in increasing pressure on the entire food chain and also increases natural predation opportunities for some species and removes food resources for others; (2) the increase in pollution that may be affecting the reproductive cycle; (3) the alteration, even disappearance of marshes, beaches, and other locales necessary for the reproductive cycle of some species – and thus for all in the chain – forcing the species dependent on them to move elsewhere or die; (4) the targeting of new species about which we know little or nothing, whether of their particular life cycle or their place in the food chain; (5) volatile market forces; (6) a rapidly

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changing commercial fisheries technology (and rising capitalization costs); (7) overlapping demands among multiple users; (8) competing life styles,[4] with special attention to the concerns of those in fishing communities who see both their livelihood and their way of life under attack from all directions.

Hopes for this type of management process were high at the outset since, despite all the complexities, uncertainties, and differences of opinion as to the present and future state of affairs, whether for practical or ideational reasons, all the participants in the management process are agreed on one thing: Steps must be taken to maintain the resources at a viable enough level to sustain the food species for future generations.

As noted, however, this approach involves a delicate juggling of competing economic and political interests, conservation and predation, the public and private good. Thus, the history and results of the process since regional council management was initiated in March 1977, have satisfied few. Charges of overmanagement compete with counterclaims of inadequate regulation – while concern over the present and future condition of the stocks grows; claims that we have too little data for an adequate analysis conflict with arguments that we are buried under data and attention needs to be turned to the production of more robust analytical models in order to gain better understanding of what the data are indicating.

Though a more fine-grained analysis might indicate more categorical subtleties, a first approximation suggests there is one major difficulty that, while hinted at for a number of years, has yet to be spelled out and addressed: *Despite that all accept that, in one form or another, a crisis confronts them, the negotiating participants – in all sectors and at all levels of the management process – are divided by their differing views of Nature.* These views are axiomatic but significantly inform each participant's approach to (1) what constitutes critical or relevant data; (2) how to interpret those data; (3) how to design crisis-appropriate responses. They are variously acquired and systematically integrated as one moves through life, making a series of commitments to various modes of thinking about the world in order to devise decision-making strategies consonant with (or at least are not in opposition to) those held by the primary groups with whom one lives and works.

Consensual Management

It seems clear that at least one of the problems in consensual fisheries management is the basic difference between the ways that representatives of the two groups identified in the opening paragraph view the nature of Nature. The consequences of this difference are twofold; (1) Different information is gathered and interpreted differently; (2) there are sharply divergent perceptions of how to manage – how to make decisions *now* that will produce intended results rather than unintended consequences. Among the longer-term effects are what each group increasingly sees as "the other side's" lack of good faith, good will, and ability to come to grips with the basic characteristics of the need of the fisheries and the industry.

Critical as a variety of factors may be in producing the "noise,"[5] that acts as a barrier among those working to manage the fisheries, a more fundamental barrier to fishery plan production/implementation seems to be a crystallization of two groups, each implicitly holding differing premises about the nature of nature and, given that nature, how to study it, analyze it, and, most importantly, manage it.

Given the basic and fundamental difference between the bargaining of participants in the chain that goes all the way from local public hearings and council activities by the people on "the Hill" in Congress, Commerce, and Cabinet, what has been the result of all this debating, arguing, and horsetrading among these diversely-constituted groups who have been charged to "Do Something"? What has been the product of the labor of all these individuals who know that they must be prepared to negotiate trade-offs, make accommodations, and be open to new input (but not so open-minded they're called "airheads" or, worse, "sell-outs to the other side")? The majority opinion of participants from all sectors is that each plan, once actually implemented, has been insufficient, inappropriate, probably incorrect, and certainly out of date.

What is critical is that each participant in the negotiation and implementation phases of management planning is embedded in a sociocultural matrix from which the primary cognitive mode – a way of perceiving and thinking about the world – is derived. Membership in and an effective affiliation with the group is maintained by articulating its axioms or certain basic, usually unquestioned truths. These are the basic formulas that, if challenged, bring frowns or pitying smirks and charges that the speaker must be "dumb," "asleep at the wheel," or "just plain nuts." Axioms are taken for granted as "right," "rational," and, "it goes without saying." Those who assume that others who, like themselves, possess an expertise in fisheries also assume that these others hold a set of assumptions in common. These are taken as "understood" by all who are "truly knowledgeable" "possessed of common sense."

The Glitch in the System

The catch is that fisheries management in the modern world requires the involvement of a range of civil servants, scientists, and user groups participating in some or all stages of management plan production and implementation. What are the consequences of engaging people with widely differing views of Nature in a project to manage Nature by consensus – especially when one of the engaged groups also has the primary responsibility for acting according to the rules in the day-to-day activities of making a living?

These models provide the yardsticks individuals and groups use when measuring "good" versus "bad management." Unfortunately, their fundamental difference and the extent to which they are rarely made explicit also create a chasm across which dialogue is difficult, if not impossible. "My position" (whether derived from scientific research or practical experience) is grounded in common sense and will surely generate sound plans; "your position" is too

general (or too narrow), complex (or too simple), rigid (or ad hoc), costly (or inadequately funded for proper implementation), ignores the human element (or is too vulnerable to manipulation in the political and economic arenas). If or when management programs finally are implemented, such deeply held but rarely explicit stated world views – call them, if you will, cognitive modes – are liable to lead members of, especially, the targeted user group(s) enthusiastically to endorse, comply reluctantly, or rigorously resist the rules and regulations.

In short, the extent to which a group whose members hold diverse viewpoints can produce a *workable* management plan that does not violate their respective axiomatic models (but need not fully reflect them), determines the degree to which industry members cooperate in making the plans work. It will, as well, influence the extent to which fishery managers will perceive the need to continue "fine tuning" the plan, a process that frequently results in continued modification, what has been termed "crisis management" (as when, once in place, the history of a plan is marked by a series of emergency actions to deal with "unexpected" overfishing of juveniles or shortfalls in landings) and what user groups see – sometimes correctly – as a bewildering and contradictory flow of rules and regulations. To this extent, management plans will come close to their target, fall short or overshoot in one or another function – or even careen wildly, producing devastating, unintended consequences.

Natural Systems: Linear and Non-linear

It is when working in the realm of second-guessing nature, particularly the fish stocks, that we are able to see this major distinction emerge. There are, on the one hand, those who view Nature in classic Newtonian terms; on the other hand, there are those whose understanding of natural processes is strikingly parallel to the model being suggested by the newly emerging science of Chaos.[6] Adherents of the first position model the world in terms of linear relationships; those of the second, in non-linear interweavings.

The one group, consisting of the majority of biologists, economists, and ecologists – those scientists and technical experts who are the lead members in marine research studies and in the state/federal agencies concerned with fisheries – see nature as (1) a system and (2) a system in which there is periodic order.[7] Essentially, the study of such a system depends on looking at it locally, studying various species, year classes, sub-regions within the marine econiche, the various ports and their landings, etc. It involves defining perimeters and parameters, identifying relevant variables and utilizing differential equations to describe processes that change smoothly over time. In such a system, one must monitor and measure within a context that stays constant from Time Measurement X_1 to Time Measurement X_2, X_3, etc.

Lending itself to the perception of the rightness of such approaches to understanding the workings of Nature is a tendency among fishery managers to speak of the reproductive process of the stocks as if there were neither interactions among overlapping generations, not unique environmental events affecting

generations differently. Overlooking such variables can add credence to the presupposition that one can directly identify the relationship between the number of, say, herring or cod at Time X_1 and the number for Time X_2 – i.e., to express stock dynamics as if the Time X_2 population is a simple function of the Time X_1 population.

Perhaps the classic expression of the linear view of population dynamics – i.e., the view that the nature is ordered, balanced and in dynamic equilibrium – was given by J. Maynard Smith (1968), whose position was that populations either remain relatively constant or regularly vary around some presumed equilibrium point. In the case of commercial fisheries, biologists frequently assume that fishing effort accounts for deviations of real populations from this model and, in the last decade especially, have moved to sustain the stocks by attempting to regulate human predation. As James Gleick put it:

> In a real world system an observer would see just the vertical slice corresponding to one parameter at a time. He would see only one kind of behavior – possibly a steady state, possibly a 7 year cycle, possibly apparent randomness. He would have no way of knowing that the same system, with some slight change in some parameter, could display patterns of a completely different kind (1987:73).[8]

In this cognitive mode, macro-level phenomena are "explained" in terms of a reductive or analytic analysis grounded in the perception that whatever is defined as the observable whole is "the natural result of the interaction between the externally related 'parts'" (Madison 1990:91).[9]

Members of the second group – for the most part industry members, made up of fishermen (and their families), buyers, and processors – see Nature as non-random ("Things don't just happen – there's always got to be a reason") but unpredictable ("If I knew everything that was going to make one trip a winner and another a loser, I'd be God"). Natural processes are complicated and dynamic; causal relations and sequential patterns (if they can be charted at all) can stretch over so long a period that they appear aperiodic. Data selected for review will appear random, disordered, non-causal in their linkages, and chaotic.

The view of Nature held by most in the industry encourages them to see their world (the fish stocks, the weather, the market, the fishery management process, whatever) as continually susceptible to disequilibrium rather than in a linear mode where entropic systems are in constant search for equilibrium. This is a perspective beginning to find some support among scientists. There are strong indications that attempts to understand population dynamics (or the weather, economic activity, or most forms of human behavior for that matter) in terms of linear relationships that can be captured on a straight line graph can be counterproductive. In the case of fisheries management, it may not be a feasible model for managing the resource and it has certainly failed to win cooperation from the industry when plans are actually implemented. Yet, those critically responsible for final plan production – in translating the variety of discussions and hearings that are preliminary to plan submission for federal approval and thus also

underwrite their final rejection/approval of plans – are, for the most past, linear models.[10] They approach the understanding of natural processes, as well as the human activities and decisions that affect those processes, with the kinds of assumptions that are both preferred by and required of those who occupy positions within what social scientists label "rational bureaucracies" – management structures in which public policy decisions are, ideally, made in an objective and non-personal fashion.

Although a recognition of non-linear processes has only been achieved in the past decade or so, it's a good guess that industry members (especially those on the front lines, the fishermen), have long organized their knowledge of Nature intuitively in terms of non-linear relationships. "Little things can mean a lot" – and make a big difference. The model of Chaos argues, that *the dynamics of systems can unfold in a non-random but unpredictable fashion.* However, they are labelled "unpredictable" only because those studying them do not (indeed, perhaps cannot) take into account an almost infinite number of small initial perturbations. These are elements ignored, dismissed, and excluded in the decision-making involved in identifying relevant current data or model configurations but highly determining in both calculated and real outcomes. We all learned the principle as school children:

> For want of a nail, a shoe was lost; for want of a shoe, a horse was lost; for want of a horse, a rider was lost; for want of a rider, a message was lost; for want of a message, a battle was lost; for want of a battle, a war was lost; for want of a war, a kingdom was – and all for want of a nail.

In the dynamic universe being modelled by students of Chaotic systems, no input our output can be prejudged to be "irrelevant," or "trivial," and little if anything can be set aside in a category labelled "All things being equal." In non-linear systems, not only does "Every little movement have a meaning all its own" but, more importantly, as the "meaning" of that small event or new input moves through successive layers of ever-more extensive networks, its significance snowballs; its potential to alter future events or characteristics of the system intensifies. Thus, small initial conditions can have a major impact "down the line." When fishermen and those in the buying and processing sector make decisions about resource exploitation, decisions that affect the extent to which they act to violate or comply with regulatory regimes, the non-linear models they use to make their individual decisions are based on a view of Nature as complicated and aperiodic. That view is that each trip, each season, each year's stock almost but never quite repeats itself – in short, that the industry operates in a universe marked by what scientists from a variety of disciplines are now identifying as "Chaotic systems."

Since it is scientists who are identifying this new model, it is clear that the distinction between those arguing for the existence of linear and non-linear views of nature is not a difference between scientists and entrepreneurs, pure theory and dirty practice, those who are smart and dumb, or altruistic (but only, snarl

the fishermen, because *their* incomes aren't affected) and greedy (because, sneer the fish managers, they can't see beyond the immediate trip's payoff). People can switch from one to another. Industry personnel usually think in linear terms when making economic decisions, especially capital investment, and, basically, the Chaos model does not deny the basic order of linear thinking dominant in rational, linear thinking, only the difficulty (perhaps impossibility) of including *all* the significant variables in a predictive model.[11]

Given that the chaos model argues that *any* small initial condition or action by a component of a system can generate consequences that magnify and intensify as one moves up to move inclusive systemic levels, it is impossible to have full rationality of action.[12]

Sensitive dependence on initial conditions can produce startling consequences. One of the early proponents of the Chaos paradigm labelled this characteristic "The butterfly effect." As Edward Lorenz put it in an important and early statement of this approach,[13] "the fluttering of a butterfly's wing in Rio de Janeiro, amplified by atmospheric currents, could cause a tornado in Texas two weeks later." Examples of this abound in the real world. Thus, it has been suggested that the crisis at the Three Mile nuclear plant – which led to the entire U.S. nuclear energy program being indefinitely constrained – resulted from one particular workman, at one point in his work schedule, neglecting one gauge on the instrument panel he was supposed to monitor – a gauge obscured by the overhang of his over-generous belly.

To further complicate the issue, it is often difficult to distinguish between two forms of Chaos. The one results from not including critical but periodic components. The second – that being discussed here – is the result of the fact that in a majority of natural, open systems, new information – strangeness – can be introduced, and thereby create a new order. Perturbed by noise (by real randomness), real systems will permit a new variant to emerge that cannot be made to disappear by future noise. In short, a Chaotic entity can also be one in which locally unpredictable innovation – strangeness – can emerge.

Fisheries as Open, Non-linear Systems

The non-linear model is a relatively new way of looking at natural systems. What are some of the effects of using it to study fishery issues?

The market and consumer behavior is one important generator of oscillations in the system. However, in the case of commercial fisheries, consumer taste and market prices also play a role in the equation. Monkfish, once little utilized and often discarded as trash fish, has become enormously popular, pricey and scarce as a result of Julia Child (riding on the crest of the popularity of gourmet dining for the affluent) pushing it on her nationally syndicated TV cooking shows from Boston. On the other hand, the same media can report pollution, contamination and cases of food poisoning and, of course, when this happens, fishermen stop fishing because processors stop buying – and fish buyers stop buying because retailers stop buying because consumers stop buying. Similarly, the North Sea

herring stocks, dangerously low in the late 1930s, made an outstanding recovery during World War II for obvious reasons. Thus, the equation must include fishing effort. When a species is popular on the market, pressure increases, stocks decline. When the market ignores a species, the modelers also ignore it and assume a population in long-term equilibrium, rising sharply when small because there is plenty of food and few predators, settling into growth zero at intermediate values, and crashing downward to near zero when large because it exceeds the carrying capacity of its niche. Theoretically, this is how any fish population would behave if fishing effort were removed. Additionally, if we can include fishing effort and this can be measured relative to growth rate (assuming that, say, in 1989 we have an accurate knowledge of the size of the stock and its growth rate), we should be able to predict the species' population size in 1990.

However, when W.E. Ricker used the logistic difference equation to study fisheries in Australia,[14] the growth rate parameter, X, was non-linear, that is, just as with friction, he discovered that growth rate serves as a messy quantity in the modelling of a stock. This means that growth rate is like, say, friction in a hockey game. As Gleick (1987:24) put it:

> ... without friction a simple linear equation expresses the amount of energy you need to accelerate a puck; with friction, the relationship gets complicated because the amount of energy changes depending on how fast the puck is already moving ... the act of playing the game has a way of changing the rules. You cannot assign a constant importance to friction because its importance depends on speed. Speed in turn depends on friction. The twisted changeability makes non-linearity hard to calculate but also creates rich kinds of behavior that concerns the qualitative rather than the quantitative. It asks: if you don't know the measurements, what can you say about the overall structure.

The market and the cumulative effect of fickle consumer patterns (to mention only two) are such quantities.

The distinction between the two models has a powerful effect on analyses that proceed from one or the other. On the one side, a whole of a system is the sum of its parts; on the other side are synergistic systems and therefore the whole is more than the sum of its parts.

Linear-oriented analysts believe that the significant components of a system can be identified so completely that they can identify the appropriate input and predict the results; this is called "fine tuning the system." Those relying on the non-linear approach argue that we can never identify an entity's full synergistic potential – the entity is "sensitive dependent" on initial conditions, which (at least at present) would be impossible to model in a temporal-susceptible entity. Thus, to this extent, nature is unpredictable.

The question of what happens when a Chaotic entity is disturbed is of critical interest to those who are involved in managing nature. Fishermen, especially, are keenly aware of the extent to which small changes can have major effects; a minor mechanical problem leads to a loss of lives; the vessel that steams in just minutes before you do is the last to sell its catch.[15] Those in the commercial

sector resist management because they believe that those who produce the management plans are insensitive to such realities. As one fishermen once said to me:

> By god, those people ["fishcrats"] are stupid! Year after year they come out here with their charts and graphs and measuring tools and go to the same spot at the same time and try to catch fish so they can compare this year's stock with last year's and 10 years ago and so on. And when you tell them that's dim, that that's not going to tell them anything, they mumble about "replicability" and "sampling procedures," and like that. Jeeesus! Don't they understand that fish *swim*? There may be more or less of them, but you'll never find out by checking in one place year after year. Fishermen know that the fish are out there somewhere. That's what we mean by "going fishing."

At least in part of what the fisherman is saying is that a small change in the local water temperature, a ghost-net, some vessel dumping waste overboard can be the minute disturbance that leads to a change that ripples along the food chain, amplifying in scale as it moves up in scale. Many see management plans as doubly damned – imposing overkill responses to normative abnormalities that, in an exercise of hubris and ignorance, managers attempt to eliminate, while ignoring the extent to which Nature is vulnerable to small natural perturbations with large consequences. Over time, industry personnel, particularly fishermen, have created a perspective of and shaped a philosophy about the natural phenomena that underwrites their livelihood. That the technological leap that has occurred in the 20th century has created a problem rarely if ever encountered before, the ability to overfish and wipe out regional stock in a matter of months, even weeks, has not yet been fully incorporated in that view.

> Every time there's a drop in landings, the fishcrats say, "how do we cut back on the fishing?" There are other reasons why fish landings can go down. And that's not to say that there isn't overfishing right now. But you aren't going to solve all – maybe not even most – of the things that can go wrong in the industry with a management plan. Sometimes Nature has a mind of her own, just like a fish does. And you know, we don't really know enough about how it all fits together. Hell! We don't even understand how just one stock works in and of itself, let alone how that stock fits into the whole picture. And these people aren't just tinkering, you know; they're shovelling sand into the works by the ton!

He went on to tell me that he once knew

> ... a man who changed a whole stretch of shore and the fishing because he drained a little piece of marsh for his son to build a house when he got married. But when you try to talk to these people about how things like that must be going on all the time, all over the place, and what that must mean to the fish and the fishing, they just look at you, throw a bunch of equations at you, and imply that because you don't go fishing according to equations, you can't be expected to understand how things really work. And then they pass another regulation to tell me how to fish – not for the condo builders, not the tourists of the marina people or the developers. And not the fish, or the weather, or the pollution. It's only the fishermen who are making the difference.

A recent example of the chasm between fishery managers and industry personnel was the dispute between, on the one hand, a group of commercial fishermen and buyers and, on the other, Dr. William W. Fox, head of the National Marine Fisheries Service, the federal agency most directly responsible for managing U.S. fisheries. The industry personnel filed a civil suit in the U.S. District Court against Fox[16] because a drift gillnet ban

> was imposed ... without benefit of new data or information ... and even though ... a substantial part of the commercial quota for Altantic king mackerel is likely to go unharvested. It was, in the final analysis, imposed on the basis of politics and preconceived conclusions...[17]

As reported in the *National Fisherman* a major news media for the U.S. fishery sector:

> Fox argues that poor information leads to honest differences of opinion. [He states that] "... it depends upon what you do with uncertain data. You can say, 'Well, this doesn't prove there is a problem even though it may imply it. Therefore we aren't going to take any action until we can prove it.' My view is ... to react in a conservative manner in the face of uncertainty" (Fee 1990:15).

Though there are other considerations at work, it is obvious that, for Fox (who teaches fisheries management and is currently in leave from his university position), uncertainty mandates linear modelling as a risk-minimization strategy when faced with uncertainty.

Conclusion

In the final analysis, every management scheme is measured not by its internal consistency and potential for success (*if* all do their part) but by the extent to which people comply with it. And a willingness to comply is usually grounded in a perception that it "makes sense." Industry members will not "follow the rules" if those rules seem too much of the time to violate *their* practical needs and *their* common sense considerations. Fish managers will be forced to "return to the drawing board" continually if their projections prove to be out of kilter with real time events. The consequences? Constant perturbations introduced into a system that, more than most (the managing of, say, forest or water resources), is already marked by unpredictability. Indeed, as those in the industry constantly repeat, it might be better to have a "good enough" (or even a "bad") plan with which there was no constant tinkering, then to aim for the "best" plan. As one New Bedford scalloper said to me (to the accompaniment of approving "Yeahs," "Right on!" and "You said it" from his fellow fishermen): "We could learn to live with *anything* if the damn Feds would just put something in place and then leave it alone for a while."[18]

This discussion has been presented not to argue for the strength or weakness

of one or another model but to demonstrate that both conceptual cores are part of the "intellectual baggage" that each and every participant in every phase of the management process brings to negotiating, planning and implementing fishery plans. This paper argues that different cognitive models *do* exist, *do* play an important role in the way people think about the world, and *do* affect everyday things that everyday people do or choose not to do.

If the existence of these subtle, covert models are sufficient to cause our attempts to deal with the problems to become subverted, perverted, or fall, I think it important to take the time to bring them out into the open, discuss the extent to which they lead to confrontation on issues that are really tangential to the fundamental opposition. It is not easy to question those things that "everyone knows" and that are taken "as given," far from being commonplace, ordinary, and trite, they frequently embody complex, sometimes contradictory components. Even after one starts thinking about them, it can remain difficult to express them lucidly - to oneself and, especially, to others. In a world where attempts to manage are increasing, it is increasingly obvious that how well we can address common problems in non-common contexts really *does* matter. It is critical to address the basic reasons why, as one long-time council member despairingly said to me a few months ago, "Sometimes it seems the more we try, the worse things get."

Notes

1. There is an extended discussion of the structure and processes of these councils in Smith (1982 and 1988).

2. For example, some councils weight the recreational sector more heavily than others.

3. This is especially true for the New England Council, from which the data for this paper were drawn.

4. For example, dwellers in urban ports, recreational coastal communities, retirement villages, or historically embedded rural fishing communities.

5. See, for example, West and Shlesinger (1990).

6. Work going on in this field has strong interconnections with the work being done in mathematics on fractals (scale invariant processes), and with the work going on in a variety of disciplines on spontaneous order or self-ordering critically, catastrophe theory, complex systems, and synergistics.

7. I stress the word "majority" since, obviously, some of those concerned with fisheries management are working with the Chaos model. A recent notable example is the analysis of the Nova Scotia fisheries produced by Allen and McGlade (n.d.). It should also be noted that the categories "linear"/"chaotic thinker" are, in a sense, ideal types; people switch from one model to another in homely ways (e.g., one may think linearly when planning for retirement but non-linearly when trying to understand why one's children behave as they do) and when addressing issues related to professional or scientific thinking (e.g., one may utilize non-linear "hunches" to inform or direct linear cognitive modes).

8. James Gleick's work is a popular, non-technical introduction.

9. For an interesting critique of the economists' utilization of Newtonian thinking, the reader is recommended to Philip Mirowski (1989).

10. This is expectable since the majority have been trained to think in terms of such models and became accredited only after demonstrating their competency in the use of such modes. Barinaga

discusses the extent to which management blunders occur because practitioners are slow to change to more up-to-date procedure – e.g., "The reservoir behind a newly built dam in Idaho is filled for the first time – and the dam collapses due to soil erosion engineers hadn't predicted" or, erring on the other end of the spectrum, "$82 million [was spent] to strengthen Jackson Lake Dam against the possibility of soil liquefaction in an earthquake – even though newer in situ and laboratory tests suggested liquefaction would not be a problem" (1990:356). Barinaga cites lack of communication and fear of legal liability. However, it is likely that, as well, one *could engage* Foucault's arguments concerning the role of the institutionalization and professionalization in creating habitual mind sets from which it is difficult to break free.

11. Speaking within the frame of the model of natural and human systems identified as the product of "spontaneous order," Hayek identifies this mode of sciencing as very different from that predicated on Cartesian rationalism, a rationalism flawed, he argues, since: "Complete rationality of action in the Cartesian sense demands complete knowledge of all relevant facts. A designer or engineer needs all the data and full power to control or manipulate them if he is to organize the material objects to produce the intended result" (1973:12). Indeed, he points out, Cartesian rationalism requires us to believe much "that we cannot know to be true in the Cartesian sense" (ibid.:12). To that extent, then, one might argue that at a certain margin, the commitment to linear models underwritten by extreme rationalism becomes irrational.

12. For one thing, we cannot tell till after the event what input may have been critical (for, obviously, if we had pre-knowledge of its criticality we would have included it). For another thing, even were they known, including all such variables would make for too complicated a model design. Finally, it might not be possible to produce a timely analysis – even with the most powerful computers. It is for this reason that, what in point of fact may be critical variables, are a priori evaluated as "givens" or set to one side in the category of "all things being equal."

13. In a paper presented at the 1979 annual meeting of the American Association for the Advancement of Science.

14. As cited by Gleick (1987:63).

15. Superstitions may be ways of expressing what fishery people understand is the chaotic nature of nature – the extent to which large-scale phenomena are sensitive-dependent on initial conditions. An open hatch is "bad luck;" it's also a condition that can lead to a lost vessel if a sudden storm rises.

16. The judge dismissed the plaintiffs' argument as without merit.

17. Lawsuit filed in Washington D.C. civil action 1990, as reported in Fee (1990:14).

18. It should be noted, however, that (1) industry personnel are just as guilty of calling for changes as the "fishcrats;" (2) one also hears from fishermen that if plans were instituted and left alone, the main reason one could "learn to live with them" is because creative minds would find loopholes and ways around the rules – in short, how to manipulate and cheat the system.

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The Fishermen and the Nation

The Identity of a Danish Occupational Group

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ABSTRACT The development of modern fisheries in Denmark meant a change in social identity for the fishermen from being an estate in a hierarchy to being members of an industry on an equal footing with the other industries of a modern nation. The fishermen of the 20th century have been strong supporters of modern development and seen themselves as partaking in it. Yet, they have maintained some distinctly non-modern views and practices. The article compares the fishermen's concepts of social categories and relations of exchange with the formal image of a modern nation and tries to demonstrate that informal aspects of modern social organization differing from the modern norm, are integral parts of modern society.

A directory of Danish fishermen was published in 1935-36. The title was *Dansk Fiskeristat* (Strubberg 1935-36). It has been of great use to fisheries ethnologists who in the two volumes would find biographical information on almost 5,000 fishermen and on the status of the industry in local areas. Instead of reading this treasure of information, one should contemplate the meaning of the fact that it has been published.

The term *stat* for this type of books is related to state and estate. It is a type of Who's who, and the mark of nobility qualifying for inclusion is that of belonging to the national fishing industry.[1] There is a tradition for publishing biographical calendars of the higher ranks, but Denmark in the 1920s and 1930s saw an almost epidemic publishing of such works on all kinds of professions: *Dansk Grossererstat* in 1925 (merchants), *Dansk Mejeristat* in 1931 (people and institutions in dairy production), *Dansk Håndværkerstat* in 1932-33 (artisan trades), *Dansk Skolestat* in 1933-34 (teachers), *Danske Værter* in 1934 (innkeepers), etc., and in 1935-36 the specified *Dansk Fiskeristat*.

In the biographical calendar of the dairy industry it is obviously the attachment to dairies that connects the people involved. There was no dairy population or dairy estate; for fishermen it is different. It made sense to speak of fisheries as a separate social segment, a population apart. A quick statistical calculation based on the biographies shows that 71 per cent of the fishermen were sons of fishermen and 75 per cent were living in the same or neighbouring parish as the one they were born in.

In the foreword A.C. Strubberg writes that the fishing industry led an unobtrusive existence: "It was known, I suppose, that we had an able and fearless fishing population, but generally little was known of its conditions of life" (1935, I: *Forord*).[2] Because of the development that had taken place and the economic difficulties of the thirties, he finds that

> It is thus natural that the practitioners of the fisheries become more and more conscious of themselves as an estate and want to address the public saying: come and see who we are and learn what our conditions are (ibid.).

In this work the fishermen from the whole country effectively step forward in their Sunday dress or navy uniform to introduce themselves as an *estate* and an *industry* of the nation. In his own local context the individual fisherman might be a poor and peripheral member of a community dominated by wellto-do farmers or towns people. But, as biographed in *Dansk Fiskeristat* and as a member of his professional association, he would be performing on the national scene as an equal on a level with members of other industries.

The organization/association is, following the American anthropologist Jonathan Wylie, a characteristic solution to a characteristically Scandinavian problem. In a comparative perspective he finds that "an ethos of egalitarian individualism" (1989:7) is a prominent feature of Scandinavian culture. This creates a problem in the relationship between individual achievement and communal equality. The way of handling this dilemma is that "Scandinavians construe realms of social interaction hierarchically, such that individuals finding themselves unequal or dissimilar at one level may meet as equals on another, more comprehensive level of social organization" (ibid.).

In the *Dansk Fiskeristat* the fishermen are presented as a horizontal community on a national level, and they are collectively referred to as an *estate* and, simultaneously, an *industry*. Fishermen and their organizations have continually applied the term "estate" (*stand*) to themselves during this century, though gradually giving precedence to the term "industry" (*erhverv*). These categories imply two different ways of classifying the realm or the nation into subdivisions: "estate" situates horizontal collectivities in a ranked hierarchy whereas "industry" situates horizontal collectivities on an equal level. Both models seem to matter for the social identity of fishermen despite the anachronism of associating estates with a modern nation state. The publication of the directory of fishermen is a statement on the identity of a social segment as part of a whole, but it is a statement which is partly at odds with a modern nation state. The cultural categories and the relations of exchange that define fishermen's social identity have implications that challenge the concept of a modern nation state.

Fishermen in Denmark

Before the Fishing Estate

Johannes Steenstrup, a historian, in 1907 warned against the tendency to project contemporary concepts on the past (1907:141). In his day it was "justified to speak of the fishing population as an estate within society" (ibid.). This was justified because fishermen made up a considerable population segment (fishing earned a livelihood for 32,600 persons) and because of "that distinctive way of living which confers on this population its particular stamp and builds its

spiritual character, results in its own traditions and views and, in short, marks it off as an estate in its own right" (ibid.:142).

Steenstrup raises the question of whether the name "fisherman" in former days designated members of a population segment or an estate and not just people engaging in the activity of fishing. His answer: there was no fishing population. From old title deeds and cadastres it appears that "many a cloister had a man who was called its fisherman" (ibid.:143) while in the 16th century there were inhabitants of certain coastal hamlets who were called fishermen, a fishing population proper did not appear until the 19th century; the mediaeval and early modern fisheries in the Sound (herring) and in southwestern Jutland (cod) was practiced *seasonally* by all kinds of people (ibid.:153-58).[3]

Steenstrup was searching for a population which *per se* could be characterised as fishermen, but, even if he had found one that would not suffice for calling it a fishing estate. "Estate" does not just refer to the internal characteristics of a social segment. It is a relational definition of the place of a part in a whole, and the whole in the 16th century was different from that in the 19th. Despite Steenstrup's demonstration – that "fishermen" have not always been there – did include an account of the relational setting of the people who engaged in fishing; fishermen and fishing rarely appeared in historical sources because they were out of focus in a society organised around landed property. What mattered for social identity and for taxation was vertical social integration and property or use rights in real estate.

Fishing in mediaeval and early modern Denmark was not an industry or a trade in our sense of the words. It was not an independent sector in the economy of the realm. Fishing rights could be part of the land rights of shore- or coast-owners, and access to the sea invariably depended on the owner of the coast (Kudlik 1986:186, 189). If nobody else, the king would be the owner. Since, however, fishing involved only moveable property, the social identity of seasonal or occasional fishermen would be subordinate to their involvement with people or landed property and to their legal status.

Not until the 19th century did specialised, full-time fishermen become a component of society in their own right, entailing some idea of being a horizontal community. It makes no sense to interpret fishermen before that time as a horizontal collectivity or stratum just because they shared the activity of fishing. The hierarchy they were part of was not one of separate horizontal strata, but one of vertically integrated persons.[4]

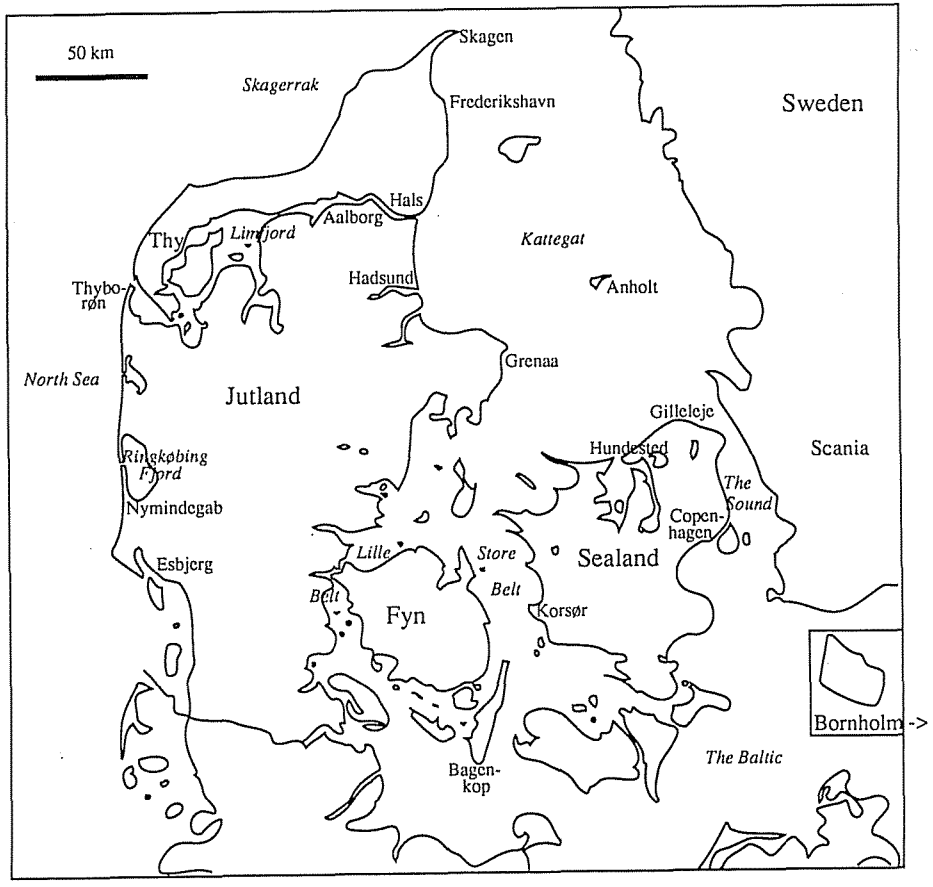
The 19th Century

"The fishermen" were dear to imagination before they became a sociological reality. The image of the brave and dauntless fisherman held by the educated public was assisted by a theatre play from 1780, *The Fishermen* by Johannes Ewald. This became very popular in the repertoire of The Royal Theatre. The plot referred to the heroic rescue by north Sealand fishermen of an English captain from a shipwreck. An account of this rescue was included in a patriotic and

edifying collection entitled *Great and Good Deeds by Danes, Norwegians and Holsatians* which was reprinted several times. In this account the fishermen were referred to as cottagers (Malling [1777]:21), in other words, they were not seen as a separate occupational category.

Around 1800 fishing was only of limited importance where good fishing opportunities joined forces with a lack of alternatives or easy access to markets. Given the limited means of transportation and the perishability of stock, fishing was largely for local consumption. The land reforms of the 1780s increased, moreover, opportunities in farming, which was apparently the preferred alternative.

At Nymindegab on the southern part of the West Coast seasonal cod and haddock fishing had survived as a part time occupation from the Middle Ages, and a large part of southern Jutland was supplied with fresh or dried fish from there (*Handels- og Industrie-Tidende* 1802:82-83). On the poor coastal fringe of West-



Map of Denmark

ern and Northern Jutland (Thy, Hanherrederne, Skagen) fishing was important for lack of good farming opportunities (ibid.:31920). In the Limfjord (by then still unconnected with the North Sea) there was an important herring fishery with pound nets and fykes not far from Aalborg (Holger Rasmussen 1968). This particular fishery was integrated in feudal forms of organization. Though unconnected with land, the sites for the standing gear were held as property, real estate, sharing much the same conditions for use as farm land. Along The Sound and in North Sealand there were also full-time fishermen supplying Copenhagen with fish. Lastly, in Store Belt there was a drift-net herring fishery in the autumn (*Handels - og Industrie-Tidende* 1802:178-80). The so-called "Belt boats" were, however, also used for freight transport. In 19th century sources the owners and the crew often hide behind such labels as "skipper" or "sailor" (Vårning 1984:22-23).

It is reported for a stretch of coast at the Store Belt that people "who have obtained plots of land for their houses after the enclosure have totally abolished fishing and prefer to earn a living from farming and day labour" (*Handels- og Industrie-Tidende* 1802:180). It almost amounts to a refrain in the reports of the *Handels og Industrie-Tidende* from all parts of the country with acceptable soil that "Fishing is not used as a way of earning a living since they all have cultivation and other such trades as prevent them from fishing" (ibid.:374). The reporter is especially alert to the innovative role of educated coast owners and does not expect much from the coastal commoners.

The 19th century was to change the fishermen's social identity and its context: the volume and the structure of the fisheries. While the wish to develop the fisheries was explicit around 1800, basic preconditions such as markets, transport and technology were still insufficient. During the 1800s population growth created bigger urban and rural markets and labour surplus (i.e. potential fishermen). Better means of transportation enabled the fishermen to reach wider markets. Well-smacks had been used from the 1750s, but from the 1820s they occupied an increasingly important role in fish the trade with cod, plaice and eels on Copenhagen, Kristiania (Oslo) and German Baltic towns.[5] In 1860 the actor A. J. Smidth, conducting a survey for the Home Office on the status of the fisheries, complained that fishing was still neglected in favour of farming in many places (Moustgaard 1987), but from then on modern development gained momentum. In the 1860s the railroad network was greatly expanded and new harbours were built. The harbour in Esbjerg was particularly important for steam-ship connections with England. The railroads connected the main fishing areas of Jutland with the vast fish markets of Hamburg and Berlin, and regular shipping routes created stable opportunities for export by sea.

The growth in fishing effort and numbers of fishermen in the decades after 1860 show that it was not willingness that was lacking before, but markets and transport. It now made sense to intensify effort and take up new fishing technologies. The first expansive innovation in the fisheries of the Inner Waters was the Pomeranian drift seine for eels which was introduced in Denmark from the 1860s onwards (Hjorth Rasmussen 1988). In Kattegat, Skagerrak and the North Sea,

the ground seine - or so called Danish seine - formed the basis of sea-going expansion in the plaice fisheries from around 1870 to 1930. For the year 1885 Drechsel in his work on the Danish saltwater fisheries enumerates 635 fishermen working in the "large scale fisheries in Kattegat," three years later the figure was 1403 ([1890]: Table II & IIIa), and by the First World War there were more than 10,000 occupational fishermen in Denmark.

Only for a short interlude did modern development necessarily mean large scale fisheries. The eel seiners were small craft of 20-25 feet, but the plaice seiners of the late 19th century were sailing vessels of 30-100 gross tons, and demanded capital investments from non-fishermen. With, however, the advent of combustion engines around the turn of century, a new and smaller type of ground seiner - aided by improved opportunities for obtaining loans - largely brought ground seining back in the hands of fishermen.[6] Since then Danish fishing has been dominated by moderate sized, fisherman-owned enterprises paying wages in shares of the catch. A wide variety of gear has been used in the varied types of what became traditional Danish fishing waters (seines, trawls, gill nets, fykes, pound nets) and adaptability to stock fluctuations and changing opportunities has been high.[7]

The Fishing Estate and the Nation

The growth of a fishing industry proper in the later half of the 19th century changed the wider social setting of the fishermen. The autocratic Denmark of 1800 was neither a consistent feudal hierarchy of personal relations, nor was it a nation of juxtaposed citizens. It was a combination: a nation of estates where each member was connected to the nation through membership of his estate. The spread of horizontal forms of community characterises 19th century Danish history. Estates were internally becoming horizontal communities, though ranked in relation to other estates; "Autocracy ... had created forms of organization which channeled currents in society to decision makers through permanent estate organizations such as the Merchants Society, the Copenhagen corporations, the guilds and, for instance, The Royal Society of Rural Economy." (Wåhlin 1981:35).

There were preconditions for further expansion of horizontal forms of organizations in towns as in the countryside. In the 18th century most arable land was cultivated by middle sized farms which were to become freehold during the following century (ibid.:13). Towns were dominated by small to moderate scale trade; artisan enterprises and industrial production was mainly based on subcontracting artisans. The country was dominated by small-scale independent producers and businessmen who organised horizontally like workers, bourgeoisie and landlords were later to do. In the towns guilds were superseded by new forms of professional associations. In the countryside, where the farming community of villages was abolished with the enclosure around 1800, new forms of community grew up in the following century: insurance- and savings-associations, farmers associations, religious movements, cooperatives and the liberal farmers' party (ibid.:31-32).

The fishermen emerged as a separate segment of independent producers in the decades around 1900 (i.e., much later than the farmers). Efforts to create a horizontal community of fishermen were motivated by the same values and the same ideal model of the relationship between the nation and its constituent parts as for the rest of society. Fishermen should unite as a social and occupational community and as such partake in the development of the nation. Initially these were the values and ideals of the educated public, not of the fishermen. Like the farmers, who got their "peasant friends" in the 1840s, so the fishermen got theirs in the 1880s. Merchants, noblemen, academics and naval officers started the Danish Fisheries Association in 1887 for the noble purpose of promoting the fishing industry economically and socially (Christensen 1983; Hecht & Vestergaard 1987). From a slow beginning the number of local fishermen's associations under the aegis of the national association grew to 125 in 1912 and almost 200 in 1937 (Sølling & Thunøe 1937:35). As in farming, communal and cooperative enterprises followed in the wake: fish sales associations, fish auctions, harbours, etc. This process, however, did not really accelerate until the 1920s and '30s (Hansen 1952:35-40).

It was members of the elite who initially tried to organize the fishermen as an estate. What were hierarchical personal relationships in a local context turned into to a hierarchy of horizontal, occupational estates in the context of formal organizations. Yet, it was still members of the higher estates who represented the fishermen on higher organizational levels. The fishermen were held to be incapable of representing their own interests in a modern nation, and their protagonists did not see them as their equals. One of the devoted figures in the efforts to organise the fishermen and promote the fisheries could express sentiments like the following in a debate on fishermen's education:

> It is a fact that here, as in other countries, fishermen generally lack the simplest qualifications for conducting their trade except for manual skills and knowledge of local circumstances. Therefore, it is very difficult to convey to them much of what could contribute to develop and promote their trade. They know almost nothing of the natural conditions of the sea, neither of the economy of its animal life, and just as little of the life of fish. They can manufacture their gear, occasionally build their boats, and they know that fish can be preserved for shorter or longer periods by drying, salting, icing; but they are ignorant of the basic principles of that technical treatment. They have but vague ideas of how they could profit from some knowledge in sanitary regards or on matters of society etc. Work at sea has exhausted them so much physically that their unexperienced capacity for thought is weakened further (Aarsberetning 1891:22-23).

But, in 1902 – the year after the introduction of parliamentarism – a similar "systems change" happened in the Danish Fisheries Association. The old board left the scene for a board composed of representatives from all parts of the country. By 1905 general rights to vote were introduced for all members. By 1907 fishermen held the majority in the board, and in 1913 the first fisherman (M. C. Jensen from Grenaa) took the chair. One of the contemporary advocates for fishermen's education, Andreas Otterstrøm, commented on the event saying: "The fishing estate has laid its hand on the rudder" (Finsing 1964, I:451).

From Estate to Industry

During the first decades of this century the fishermen succeeded in winning themselves a valid place among the industries of a modern nation. That is what was celebrated with the publication of the national directory of fishermen in 1935-36. The status as an equal industry among industries was not a matter of course. Expressions showing the memory of hierarchy and estates often mix with expressions of equality and independence. They were not just memories of a past when the development of the fisheries was under the patronage of higher estates, but continued to be a matter of actual relevance in many local contexts and to form part of fishermen's interpretation of social relationships despite the fact that self-reliance and independence were core values.

Locally many forms of hierarchical social relations were still to be felt. Until 1958 the use of several forms of standing gear on the coast depended on the "eel weir privileges" of the coast owners. The fishermen had to rent the fishing sites or the owner might use them himself (Betænkning 1955; Vestergaard 1985; Warming 1931). Harbours and landing places were frequently dependent on landlords or community councils dominated by farmers. In the fishing village of Lundeborg on Fyn the fishermen in 1931 took over the harbour facilities from the manor Broholm. The lord of the manor used to be a reasonable patron who granted the fishermen access to the harbour, some of its buildings and drying places for nets on very lenient terms. When after 1931 the fishermen applied for public subsidies to repair some quays they were initially met with comments like the following from a farmer: "I cannot understand that you can bring yourself to beg for money to have your boats lying in the harbour. If I needed a garage for my car I would certainly build it myself" (Interview, Lundeborg 16.8.1989). The farmers did not feel obliged to be patrons though they sat in power in the community council.

In parts of Sealand a form of patron-client relationship was long maintained between farmers and fishermen. Most of the fishermen in Gilleleje in Northern Sealand had a particular patron farmer (*venningsbonde*). Their relationship involved the exchange of fish and farm products. Occasionally the fisherman would work for the farmer digging peat or otherwise, and the fisherman would buy potatoes from the farmer which he would take to Copenhagen in his herring drifter during winter. There could, moreover, be some expectations that the fisherman would vote for the farmer or his candidate at elections. The potato freights from Gilleleje to Copenhagen continued until around 1960, when their vessels could still be seen at the quays of Nyhavn (Interview, Gilleleje 28.1.1983).

This type of vertical social ties were much less prominent in large, new ports that were socially less integrated with the surrounding countryside. Fish auctions and cooperative fish sales associations are measures liberating fishermen from the dependence on particular fish buyers. Their spread correlated with the size of the fishing ports and with the separation between fishermen and the sur-

rounding community. Cooperative sales were established already from the first decade of this century, particularly in moderate sized fishing ports with homogeneous fishing populations (e.g. Anholt, Hals, Hundested, Korsør, Bagenkop) and fish auctions were established from the 1920s onwards in fishing harbours of sufficient size (e.g., Esbjerg, Thyborøn, Frederikshavn, Skagen). Locally, however, the idea often met opposition from fishermen who were unwilling to renounce the safety involved in mutual social obligations between fish buyer and fisherman.

Partaking in the progress of a modern industry was an advance in social status, it motivated support of modern individualist values (self-reliance, independence, freedom), and gave emphasis to the value of community between members of the same industry. This is no contradiction: the community in question is that of free, individual fishermen. It seems more contradictory that some statements imply that hierarchy is a negative aspect of the social order while others imply that it is positive. This difference, however, is related to whether the issue is downward social mobility and inequality among the fishermen themselves (negative) or upward social mobility of the fishermen collectively and vertical ties of solidarity (positive).

At the 50th anniversary of the Danish Fisheries Association in 1937 the chairman of the meeting, L. Pedersen, stressed the importance of "solidarity with the estate" and said that fishermen should "grow together and elevate the estate" (*Dansk Fiskeritidende* 1937:286). On the other hand, the eel weir privileges were offensive vestiges of a feudal past. But then, unlike the idea of an estate, these rights implied inequality among the fishermen themselves; "The fisheries must be a free industry. When I refer to the fisheries legislation as hopeless, it is the section on eel weirs I have in mind. That is the greatest disgrace in the fisheries laws" (Chr. Meyer, Korsør, ibid.:300). Yet, the same Meyer had his reservations when it came to freedom saying that it was "terrible times for the fisheries being exposed to a laissez-faire economy" (ibid.:290). Here he was thinking of the price formation on fish in the 1930s, which gave another fisherman, Johs. Larsen, Hadsund, occasion to complain that "fishermen have sunk to the same level as farm labourers and proletarians" (ibid.:299). The economic difficulties of the 1930s did not, nevertheless, stop the fisheries from becoming an independent industry and the fishermen from becoming an occupational community. Vertical ties between persons and between estates were giving way to mutual independence.

The Modern Fishing Industry

The period from the 1920s to the 1960s was the heyday of what you could call traditionally modern Danish fisheries. Stock fluctuations, changing adaptions and technical innovations were integral parts of a stable order, where problems could be solved and growth secured within the frames of private, moderate scale enterprises. Modernization made sense as a beneficial process leaving the poverty and dependence of former times behind without affecting the social organization of the fisheries.

In 1964, at the summit of uncontested modernization, a new national biographic directory of the fishing industry was published: *Danmarks Fiskerierhverv* (Finsing 1964). This differs in several respects from the old directory. Instead of giving local accounts of the fisheries connected with local collections of biographies, general accounts of the Danish fisheries are kept in one volume while all biographies have been listed alphabetically in the other volume. The directory has been modernised, brought into line with the idea of a nation state.

In the *Danmarks Fiskerierhverv* the fishermen are not particular members of a local context, but general representatives of a national industry (including fish farming and fish trade). The old directory had a hierarchy of levels: each fisherman belonged to a local community and the local communities formed parts of a national fishing estate/industry. The new directory has one level: individuals associated with the Danish fishing industry. The intention behind this publication was not to introduce the estate to the public, but to provide background information on individuals to people conducting business with the fishing industry (Finsing 1964, bd. 2:7-8). The form of this work corresponds to the nation state as a society of separate individuals (cf. Dumont 1986:10). Liberal ideals of independence figure prominently, even to the extent of belonging to fishermen's inherent nature (Finsing 1964, bd. 1:50). The ideas on the relations between parts and whole in the nation have, nevertheless, retained certain hierarchical implications. The horizontal community within the nation remains important, which is maybe not surprising in a country where even the nobility has founded a union (Rosenkranz 1932). But, the term estate is still in use (Finsing 1964, bd. 1:37, 449, 459),[8] and there are strong notions of vertical solidarity between fishermen and higher levels of organization in society.

Fr. Lodberg Jensen from Esbjerg expresses the wish that "the sons of the sea [may] always consider it an honour to be a free and self-reliant industry" (ibid.:52-53). This is supplemented by the value implications of statements on, for instance, the catches which the fishermen "bring home to the household of our society" (ibid.:59). "Economy" literally means "household management," not "market." *Bringing fish home to the household* depicts the fishermen as subordinate contributors to a hierarchical whole rather than just suppliers to a market.

During the 1980s the viability of the traditionally modern model of Danish fisheries has been threatened by a serious crisis. The fishermen have difficulties earning enough to cover their costs. The number of fishermen has slowly, but steadily declined since after the Second World War, and during the last decade the pace has accellerated. The size of the fishing fleet has been falling since 1976 from 3,756 vessels over 5 GRT with a total gross tonnage of 141,928 to 3,007 with a total tonnage of 121,602 in 1988.[9] This has not been enough to solve the problems which are owed to a complex of reasons: stock decreases, the Law of the Seas, political interference, seasonal oxygen depletion, etc. Danish quotas have gradually been reduced, sometimes corresponding to declining stocks, sometimes contrary to fishermen's experience of the stock situation. Bankruptcies and economic difficulties are no longer limited to incompetent fishermen and

bad administrators. Successful fishermen see their closest rivals surrender. Regulations, quotas and limited access to traditional – now foreign – fishing waters interfere with the usual strategies of finding a way out of economic difficulties: switching of species, technology or fishing water. This situation has even made fishermen's wives stand up to engage in public debates in the press in defense of their husbands and families.

Traditional and Modern Identities

Part and Whole in Society

Social identity concerns the place of parts in a social whole. The whole, its constituent parts and the relations between them, are shaped by social exchange and cultural classification.[10] Possessing an identity means to identify with a category and to be confirmed in belonging to it in social exchange with others. Social relations and communities depend on memory or imagination for their maintenance (Anderson 1983:15), and they are imagined differently in different cultures.

From widely different starting points Benedict Anderson and Louis Dumont have given very similar descriptions of different cultural ways of ordering the relations between parts and whole. Anderson (1983) deals with the specific way the nation state imagines itself as a community in contrast to the ideas of the social order before the nation state. Dumont ([1966]; 1986), for convenience generalised to traditional and modern societies, compares Hindu society with the modern West. I do not think it does serious injustice to the authors to sum up their contrasts thus: on the one hand, a social order where the parts are seen as relating to the whole through a hierarchy of concrete relations of social exchange, on the other hand, a social order where the parts are seen as a collection of separate entities with inherent identities while the whole is nothing but the sum of parts, something individuals relate to through the abstract act of identifying with it – not clientship that links you to the nation, but citizenship that identifies you with it.

Dumonts frame of comparison is an objective, universal principle which transcends the difference, the principle of *hierarchy* (Dumont [1966]:66; 1986:227, 247). Any relationship between part and whole is hierarchical since the whole encompasses the parts and implies a ranking of orders. This applies to ecosystems as to societies even if particular societies imagine it differently. So, in an objective way, modern society is a variety of traditional societies, a variety that tries to neutralise hierarchy.

The Neutralization of Hierarchy

The fishermen subscribe to being members of a modern nation. Their relations to that whole (as judged by themselves and by others) are in important respects those of a nation that has been very keen on neutralising hierarchy.

> In general, an ideology hostile to hierarchy must obviously dispose of a whole battery of devices for neutralizing or replacing the relation in question... The first consists in avoiding the point of view in which the relation would appear... A second and very important contrivance lies in the absolute distinction we draw between facts and values" (Dumont 1986:227).

To separate fact from moral value is to say that social facts are not total social facts in Mauss' sense.[11] It has been common to distinguish modern from so-called primitive society by its separation of economy, politics, etc., into distinct spheres. Exchange relations may thus be seen as functions that concern only their stated purposes without involving total persons. This is a denial of the social dimension of value and of the ranking which is produced all the time when exchange is based on the principle of reciprocity. Market transactions are not supposed to create moral bonds between a particular buyer and a particular seller, they do not rank exchange partners morally according to who gave the most, and attempts to maximize profits at the expense of your exchange partners are not morally condemnable. After the act exchange partners remain intact as separate individuals without particular ties between them (Anderson 1983:15-16). The focus is elemental, not relational.

The denial of total social exchange and of hierarchy deprives the modern social cosmology of moral bonds between part and whole, citizen and nation, except for abstract identification. The highest value in Dumont's traditional society pertains to the whole and is something you link with through social connections (Dumont 1986:20-28, 40; Anderson 1983:40). The highest modern value is the individual which is not an entity to relate to, but to *be*. Each individual incarnates the nation or mankind or whatever whole is in question, instead of relating to it through social exchange.[12]

Western political systems depend on the conception of society as composed of separate free citizens. As citizens we are similar. The division of labour in modern society rests, nevertheless, on complementary differences in society. This does not contradict the political order because the differences are not ranked. The division of labour is not a total social fact, but merely an economic fact without implications of social value differences. The values involved are economic, factual and not social or political. It is statistics and not theology that is relevant to the interpretation of the values involved in exchange in modern society. Statistics conjure up a social space full of comparable units, none in itself of any unique importance, but all representative of a type of phenomenon (cf. Anderson 1983:35). The fact that industries contribute differently to the national product does not rank them socially. The value dimension is not relevant as a hierarchical differentiation of persons. In the modernist model the "good" of being a fisherman is not seen as depending on social links to a hierarchy; it depends on the identification of fishermen with a modern industry. Partaking in modern development is good and meritorious as such.

As suggested by Wylie (1989) organizations and associations in Denmark are devices that handle the problem of equality versus hierarchy. Here the neutraliza-

tion of hierarchy is not an effect of separating moral value from factual relationships, but of "avoiding the point of view in which the relation would appear." When fishermen have to negotiate with representatives from other industries or estates this is handled by their associations. The organizational hierarchy of the associations has created forums for horizontal exchange at higher levels where fishermen are still be represented by fishermen or by administrators employed by them.

The Heterogeneity of Modern Society

To a considerable extent modern, industrial nation states manage to function as if social hierarchy and total social exchange were neutralised. Modernization theory expected such traditional components to disappear. But so far, heterogeneous forms of organization and exchange continue to be at work in actual modern societies, and some of these forms differ much from the modern norm. It seems, furthermore, a vain belief that the internal heterogeneity of industrial nations should give way to homogeneity in a convergent development of all industrial nations (cf. Berger and Piore 1980:1-4). Berger and Piore emphasise that among the resources applied in the solution of present problems are past values, choices, practices, and institutions, which are continuously being integrated into new patterns, even in the most leading of industrial nations (ibid.:8). "Traditional" components are parts of contemporary societies. What qualifies them for the label "traditional" seems not to be age, but that they do not harmonize well with the formal image of a modern society although they may be important preconditions for its maintenance and success.

Despite the denial of hierarchy nation states do have objective hierarchical dimensions. Modern nations do contain different levels of organization, subsystems that are ranked. They do contain people (probably most people) who find their social identity dependent on participation in social exchange, people whose value – in their own eyes and in those of others – is not exhausted by their abstract identification with a category in a social classification scheme, but requires that they relate to the whole through concrete social exchange. The Danish fishermen are a case in point even if, at the same time, they subscribe to modern interpretations.

Fishermen's Identity

In the 1930s and in the 1960s the terms and expressions for fishermen's place in society in part confirm and in part contradict the idea of the nation state. Fishermen saw themselves, and were seen, as members of an industry, a category of citizens earning their living in a similar way. The differences between industries were defined in terms of relations to different resources, and not in terms of ranked social relationships – the modern. Simultaneously the fishermen saw themselves, and were seen, as an estate, a social entity in a morally ranked context. This was not modern. In the 1960s the distribution of emphasis on industry

and estate had moved in favour of industry, but the framework remained the same.

The fishermen accept the nation state interpretation of their relations with society. It confers value upon them by making them participants in progress. It has created distance to a socially more humble past, and has abstractly identified them with the nation, a whole that is a sum of individual citizens. At the same time, their own interpretation of social relationships implies a hierarchical, relational order which the nation state sees only as a memory about the past.

Modern outsiders may hold the view that fishermen relate to one another in correspondence with the economic theory of common property resources: they are competing rivals for the same resource, united and divided by their similarity in relation to resources.[13] But, seen from the inside this is not the whole truth. There is one type of complementary difference between fishermen that gives them reasons for reciprocal exchange, namely the differential experience which is continuously renewed through the daily work of each unit and which is potentially useful information to other fishermen. This information is not exchanged for money, but as reciprocal gifts creating social connections, giving prestige and confirming the value of the participants as members of the community (Vestergaard 1989a and 1989b).

As to the relationship between fishermen and fish buyers or net dealers it is obviously one of market exchange; but, particularly when private fish buyers were involved, these relationships have commonly been modified considerably by social exchange of favours, gifts, credit and some protection against the full impact of market prices. At the same time the fish buyers or net dealers have commanded more resources than the fishermen and represented higher levels of integration in society providing for patron-like relationships with the fishermen.

Official fisheries authorities like the fisheries minister and his officials have definitely been seen as representatives of higher levels in a hierarchy however much they represent a democratic government. But, the spirit of the relationship has generally been one of positive solidarity. The fishermen see fishing as a noble task, one appreciated by the state "household" as a valuable contribution. Conversely the duty of the head of the household as represented by the fisheries minister must be to solve higher level problems in return. This places the fisheries minister in the position of a patron obliged by social relations of exchange with his clients.

Hierarchical Antagonism

There are occasions when hierarchical social relations do not involve protection but conflict. This occurs in the relationship between fishermen and fisheries biologists. Fisheries biologists have a higher education and are employed by authorities at a higher level in society. They represent a relationship of learned men to laymen which has not been forgotten. When involved in fisheries regulation they do not represent a complementary authority to the fishermens domain,

but a rival competence in knowledge of fish stocks. This turns into a problem when fishermen and biologists disagree.

The results of biological research can be disputed, but they cannot be negotiated through the fisheries organizations. Not until political decision making takes place on the basis of biological advice will there be opportunities to ward off or mitigate the consequences of the disagreement. It is not only disagreement on factual matters that separate fishermen and biologists, but also the violation of social taboos: a hierarchical social relation that cannot be avoided, neutralised or turned into social exchange. The relationship exposes an antagonistic, unequal relation of power, a combination of rivalry with inequality in relation to an administrative hierarchy and unequal claims to objective truth.

The fishermen's knowledge of marine resources is mostly concrete, time- and place-bound, and of unique relevance to each fisherman's evaluation of fishing opportunities. The importance of fishermen's social exchange of information has increased in Denmark during this century. Its practical utility has increased with the increased switching behaviour (geographically and stockwise) of individual fishing enterprises. One should not underestimate the capacity of this social exchange system to mobilize and coordinate dispersed knowledge of fishing opportunities despite the secrecy game that is part of it. With the expansion of the information exchange beyond the local community the social spheres of the fishermen have increased correspondingly.[14] Aside from being a community of occupation and a sphere (or overlapping spheres) of social exchange, the fishermen are also a knowledge community. Their knowledge is of matters invisible, which accentuates their separateness as a community or even secret community (cf. Vestergaard 1989b:94-98).

To the extent fishermen's knowledge is accessible to the authorities the latter have difficulty in making it useful. The fisheries authorities need modern data, which are comparable and can be handled statistically providing the basis for general guidelines.[15] The relationship between fishermen's and biologists' knowledge of fish is not one of hierarchical integration but of hierarchical separation between domains only one of which is compatible with the requirements of state administration.

The relationship between formal and informal rights represents a comparable schism. This distinction cannot make the same sense in the feudal model where the whole is a hierarchy of social exchange that can accommodate both traditional rights and written, legal rights in the same structure. The modern model would have to neutralise rights associated with social exchange. Such rights can either be left as harmless informal rights as in gift exchange for birthdays or obligations between members of a family enterprise, or they can be criminalized as when classified with underground economy, corruption and nepotism.[16]

The Crisis in the Fisheries

During the 1980s the fishermen's view of their place in the world has been seriously troubled. The crisis in Danish fisheries has not only consisted in traditional

difficulties. It is also a breakdown of the social identity of fishermen who have come to feel like a dying species.

> Even fishermen who used to have a reasonable economy can do nothing but watch while the cartload is tipping over. His whole life – it is an attitude to life being a fisherman – not only his material values is he loosing, but also the purely human values (from the general meeting in *Aarhus Fiskeriforening* 1990, quoted in *Dansk Fiskeritidende* 1990, nr. 7:10).

Individuals and the whole industry have often experienced economic crises due to catch or price fluctuations. With, however, the EEC fisheries policies, quotas and regulations of the last decade the basis of vertical solidarity between fishermen and authorities has broken down. The authorities might not know that they were expected to act as reciprocally obliged patrons, and in the experience of the fishermen the authorities can no longer be interpreted that way. The fisheries minister is no longer seen to act as a complementary supporter of the fishermen's cause, but as an antagonist, someone who is unable or unwilling to protect the fishermen against onslaughts from outside, or as the partial protagonist of some fishermen against others.[17]

The fishermen feel let down.[18] The experience that their gift to the "household" is unwanted implies that their social value is rejected. The wish that "we should like to be law-abiding," is sometime expressed. This is a wish to be restored in a position as citizens pursuing what they find is their rightful business and as valued contributors to a hierarchical household. The fishermen's image of their place in the whole, their identity, is in jeopardy, and the options of being law-breakers or registering their boats in foreign countries tend to become morally justifiable.

The crisis has affected the relationship between fishermen and society. The severity of the economic problems effects their internal solidarity, too. Knowledge of fishing opportunities becomes so economically valuable that it is tempting to increase secrecy and reserve useful knowledge for one's own purposes or keep it within narrower circles protected by the increasing use of radio scramblers. The increased knowledge of disappearing opportunities is worth nothing as a secret and as a shared reference of identity for a community.

Conclusion

The Danish fisheries are presently a depressing example of traditional social components in modern society. It *is*, nevertheless, an example of a social segment in modern society whose identity, particularly as seen from within, is not at all exhausted by their place in a modern interpretation of the relationship between society and its parts. It is definitely unpleasant to fishermen to be the object of policies based on the modern interpretation of their identity, which sees them only as uncoordinated competitors that need regulation and who have no claims to protection by patrons in power. Yet, it would be equally unpleasant if the social order was rearranged to forget the distinction between facts and moral value in

the formal sphere since that distinction is the precondition for the independence of the fishermen as for the integrity of citizens generally. The point of these reflections on fishermen's social identity in a modern society has been to show that informal or traditional dimensions which cannot be integrated into the formal image of a modern society are none the less integrated parts of its reality. Modern society has been based on abstracting from hierarchy and social exchange that was actually there. Modern society is a variant of traditional societies, and it must be part of its definition that it could believe this was not the case.

Notes

1. A note on translation: The meaning of the term "erhverv" can only partly be rendered by the term "industry". "Erhverv" means a way of achieving a living and covers both a branch of trades and individual occupation. The term has stronger connotations of independent enterprise than of wage labour. Referring to a branch of trade and its practitioners it bears a formal resemblance to a category as "nation", i.e., comprising a quantity of separate, equal members.

2. Quotations from Danish are translated by the author.

3. John Kudlik's research on mediaeval fishing stations in eastern Denmark suggests that fishing prior to 1500 was not practiced by specialised fishermen, but as an activity among others which was quite important in certain parts of the country (1986:123). It also suggests that the prominence of maritime components in tradition was on the vane around 1600 (ibid.:199). Anecdotal evidence from the 19th century speaks of the former importance of geographically mobile fisheries (*Handels- og Industrie-Tidende* 1802:373-376, 378-384; E. Tang Christensen 1891:17, 19).

4. Benedict Anderson (1983:16) remarks on the French aristocracy under "l'ancien regime" that it was not imagined as a class but as particular persons in particular positions in relation to other persons. Nicholas A. M. Rodger (1989) describes the change in the social system of the British navy from 1750 to 1800 as a change from hierarchical social integration through reciprocal social relationships to class stratification. In the beginning of this period it was common for officers to bring crew members from their home area, to bring these men along when moved to another ship, and to accept respectable mutinies according to tradition as a legitimate way of complaining over specific matters or persons. At the end of the period officers and crew had become socially separate groups without mutual personal relationships and mutiny was interpreted in the image of the French revolution as threats to the social order rather than to persons.

5. Skippers from Bornholm in the Baltic had run well-smack enterprises for transport of cod since around 1760. A pharmacist in Frederikshavn in Northern Jutland started a well-smack enterprise before 1820 taking live plaice to Copenhagen (Krøyer 1866:116 ff.). This traffic expanded and continued until around the Second World War. Live fish trade with plaice, cod and eels became an important component in Danish fish marketing. For small cod this lasted until around 1960 and for eels it is still the case.

6. Poul Holm (1990:57), referring to Odd Vollans description of Western Norwegian fisheries, mentions a similar effect of the introduction of engines.

7. Examples of different Danish fisheries in the 20th century can be found in Moustgaard and Damgaard (1974) and Moustgaard (1984) (gillnets), Vestergaard (1985) (pound nets) and Wohlfahrt (n.d.) (mainly small trawlers).

8. The term estate (stand) is still in common use to designate the community of certain professions, e.g., physicians, teachers, clergymen.

9. Fiskeriberetning (1977, Table II-4) and Fiskeriårbogen (1989:394).

10. Classification and exchange may be reckoned as core issues in 20'th century anthropology. Cf. Durkheim & Mauss ([1903]), Mauss ([1925]), Lévi-Strauss ([1949]) and ([1962]), de Josselin de Jong (1977), and – to name a specific study – Platenkamp (1988).

11. "...in these 'early' societies, social phenomena are not discrete; each phenomenon contains all the threads of which the social fabric is composed. In these *total* social phenomena ... all kinds of institutions find simultaneous expression: religious, legal, moral, and economic" (Mauss [1925]:1).

12. In Oslo, Norway, a poster was placed over one of the streets in 1984 which could illustrate the conception of the relationship between citizen and nation state. It said: "If you violate the law you commit a crime against yourself!" It is the same configuration which enables anti-whalers to say: "It is an offence to my dignity as a human being that people kill whales!" This is based on the abstract identification of individual , not with nation, but with humanity. Humanity is supposed to be composed of separate, similar individuals displaying the same features of humanness as oneself. Hierarchization creeps in all the same, but in a form which segregates superiors and inferiors instead of connecting them in relations of social exchange. In consequence the others are either non-human, in need of improvement or they must be cleaned out. The modern way of imagining community has an inherent potential to pervert individualism into totalitarianism. Dumont explains modern racism in a similar way in distinction from traditional socio-juridical differentiation of population segments like castes in India ([1966]:254-55, 1986:256).

13. On the economic theory of common property resources, see Andersen (1982), Cunningham et al. (1985, ch. 2), Scott Gordon (1954), Vestergaard (1989c:158-60), Warming (1911, 1931).

14. Mobility applies to seasonal moves to different waters and to some extent to residential mobility. In the biographies of *Danmarks Fiskerierhverv* from 1964 the percentage of fishermen's sons was as high or higher than in 1935 (75 per cent), but the percentage of fishermen living in the parish where they were born or in one of its neighbouring parishes had shrunk to 57 per cent from the 75 per cent of 1935.

15. It would be relevant to compare social exchange among fishermen with the market as an information mobilizing device. Despite important differences of principle both are spontaneous forms of order mobilising dispersed knowledge, and they differ in a similar way from classical modern science: "The difference between economic competition and the successful procedures of science consists in the fact that the former is a method of discovering particular facts relevant to the achievement of specific temporary purposes, while science aims at the discovery of what are sometimes called 'general facts', which are regularities of events" (Cf. Hayek 1984:256).

16. "A significant reason for underground economy is often that 'you have always done it that way'" (Toldvæsenets 1983:26). The crisis in Danish fisheries since the 1980s has, among other things, resulted in reader's letters from fishermen and their wives seeing the formal rules as violations of the "rights" of fishermen (e.g., *Dansk Fiskeritidende* 1990, nr.6:2).

17. The strained relations between the fishermen and the fisheries minister were relieved to a certain extent in the end of 1989 when a fisherman, Kent Kirk, became fisheries minister. But the new fisheries minister is more vulnerable to accusations of favourizing some fisheries at the cost of others than was his predecessor who was not a fisherman.

18. It is particularly demoralising to compare the size of fines and confiscations for even minor offenses of fisheries regulations with for instance fines for industrial pollution or illegal trade with South Africa. It is not uncommon for fishermen to be fined up to several hundred thousand Danish Crowns to be paid out of an individually owned small-scale enterprise (see for instance *Dansk Fiskeritidende* 1989 nr. 36:5 & 6, nr. 42:2; 1990 nr. 6:2, nr. 10:3).

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Of Seals and Souls

Changes in the Position of Seals in the World View of Icelandic Small-Scale Fishermen

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ABSTRACT This article is concerned with the changes in attitudes towards seals among Icelandic small-scale fishermen. The material on which the study is based comes from recent fieldwork in an Icelandic east-coast fishing village, but also on the experience of the author as a native participant in small-scale fishing. It is argued that in order to understand the particular cultural change one has to see how it is "externally induced yet indigenously orchestrated" (Sahlins 1985:viii). Here the external influence is provided by the campaigns of environmental and animal welfare organizations against the killing of marine mammals.

Introduction

Why is it that an animal that has in general held a positive position, or at least a neutral one, can in a short span of time become loaded with negative feelings? I started asking myself this question some years ago after listening to a conversation between two fishermen who were discussing the technical possibility of exterminating seals that live along the coastline. The seals, for these men, were like rats in the sea with no right to exist.[1]

These extremely negative attitudes towards seals struck me as somewhat odd. I did not recollect such feelings some 14 years ago, when I started participating in small-scale fishing. Something had happened in the meantime. But what, why and how? This essay is an attempt to approach these questions.

At first it seemed to me that practical reasons provided straightforward answers. Seals had always been a source of food and income for Icelanders (Kristjánsson 1980). But as a result of the anti-sealing protest campaigns sponsored by animal welfare and environmental organizations, mostly against Canadian (Newfoundland) hunting, sealskins and other products have become almost worthless. Although the anti-sealing campaigns had mainly been directed against the Newfoundlanders' taking of young harp seals, the generalized nature of the protest made all seal products almost unsalable for Newfoundlanders, Icelanders, or Inuits. The effects were thus felt everywhere seal hunting had provided a source of subsistence and income. The economic benefit of having seals around had disappeared.

But there were also other "practical reasons" for the seals falling from grace in the Icelandic setting. In the beginning of the seventies there was a growing concern about the role seals play as a link in the life-cycle of the codworm, a worm which matures in the guts of seals and then spreads with its faeces (Bonner

1982; Pedersen et al. 1985). Cod and some other types of fish become contaminated by these worms which have to be picked out of the fish-fillets in the process of cleaning the fish, before it is exported to non-wormliking consumers in Europe and the United States. Getting rid of the worms costs the Icelandic fish industry, and thereby the Icelandic national economy, large sums of money.[2] Seals are also accused of taking a large share of the increasingly scarce resources of fish (Hauksson 1989) and scaring away fish from the local fishing grounds. Seals are no longer a contribution to economic resources. They have become the rivals of humans. One informant, a small-scale fisherman, sums up the feelings of those I talked to, saying:

> Seals around here are a pest. It is bad enough that they eat all that fish, but they also scare away fish from the fishing spots near to land. And there are not as many fishworms in the fish since they (the authorities) began paying bounties for killing seals.[3]

This is all very well and easily understandable in the sense that the attitudes have their material grounds. But I still had difficulties grasping why the fishermen of my village had these strong hostile feelings towards seals. Was there something more to it?

The Meaning of an Animal

Claude Lévi-Strauss has said with reference to the use of history in anthropology that if one wanted to understand the role of the aperitif in French social life it would be necessary to know about its history (1979:12). I do not know why he used the aperitif as an example, but it might be that it is good to drink and think. Seals have been living round the coast of Iceland since the island was first inhabited by Norsemen in the ninth century (cf. Byock 1988; Hastrup 1985a and 1985b). It is difficult to estimate the importance of seals for the subsistence of the early Icelanders but at least in some places it may have been considerable (Amorosi 1989:213), sometimes enough to evoke land disputes (Byock 1988:178).

Seals seem to have been a common theme in Icelandic folktales. They also occur in tales from Scandinavia and the British Isles (cf. Kvideland and Sehmsdorf 1988). In a manuscript written in 1641 an Icelandic scholar, Jón Gudmundsson "the learned," tells the following folktale:

> A man was on his way to celebrate Christmas and late at night walked along by the sea. He then heard the sounds of festivities, dance and enjoyment. He also saw that on the beach there lay many sealskins. He took the smallest one and put it inside his clothes. Then the elves ran wildly to their skins and plunged into the sea. All except one girl who was without her skin and although she tried to get it she could not. The man then got his hands on her, took her to his home and married her. She did not love him. They lived together for twelve years and had two children, a son and a daughter. But all this time it is said that a seal was seen swimming near to the shore where they lived. It was the elf-husband. Finally the woman retrieved her skin while her husband was away. She disappeared and was never seen again (Arnason in Kristjánsson 1981:436)

There are different versions of this story but they all have in common narratives about seals who, at certain times of the year, take off their skins under which they are like human beings. The version above is unusual in that Gudmundsson talks about elves instead of people. It is always a female that is caught by (most often) a farmer's son.

Another Icelandic scholar, writing in the eighteenth century, is perplexed over the curious confusion of seals and humans. Describing the commoner's ideas about seals he writes, in the spirit of an enlightened scholar:

> It is quite extraordinary how common Icelanders have a strange and mixed feeling of disgust and respect towards the seals. The causes of this are in the first place the ignorant view that seals are more man-like than other animals. The curiosity of seals and their intelligence strengthens this opinion. Then there is the folktale told here about Pharaoh, king of Egypt, and his army, who drowned in the Red Sea and the story tells how they all became seals. Another folktale with as little grounding but which claims respect for the seals, relates that seals are a group of people called sea-people (*sæfólk*). These people live in their dwellings at the bottom of the sea and wear sealskins on their human bodies. Sometimes they take them off and, in fair weather, walk on the beach for leisure. Sometimes men have women belonging to this people and married them (Olafsson in Kristjánsson 1980:434).[4]

This account becomes especially interesting when read in the light of "liminality theory" (see, for instance, Leach 1972, 1976; Douglas 1975, 1984; Jacobson-Widding 1979; Perin 1988). Seals are liminal in two ways: first they cross the boundaries between animals and humans which is universally important (Leach 1982:118). Secondly they are "betwixt and between" in the land/sea dichotomy which is held to be especially important in the cognitive classification of space in the Icelandic context (Hastrup 1985a, 1985b; Pálsson 1986, 1990) and as seems to be the case in many fishing societies (van Ginkel 1987; Löfgren 1981; Sahlins 1976:41; Cove 1978).

It seems clear that seals cross the classificatory boundaries between human beings and animals, being Pharaoh's soldiers who have turned into seals.[5] But neither do they belong entirely to the categories of land or sea. Icelandic seals whelp their pups on land, they rest there and for a certain period of the year they have to stay on land in order to renew their pelt. But they hunt for food in the sea and spend much time there. They are marine mammals who cross the boundaries of animals belonging to the sea, such as whales of fish, or animals belonging to land, such as foxes.[6]

So far so good. It seems that we may be dealing with a typical example of a classificatory monster with all the ritual foci, sacredness, disgust and special value and interest packed away in its rucksack. But it is best to be careful and also listen to skeptical voices:

> ... it is important to distinguish genuine anomalies from those produced by careless use of the taxonomic method. Repeatedly, "anomalies," have been shown either to be spurious or culturally irrelevant... We must be careful not to invent anomalies where they do not exist... Whereas the inbuilt, rigorous logic of ethnographic method easily gives rise to

> anomalies, the informal logics of folk systems permits its avoidance (Ellen and Reason 1979:14).

Only a few of the fishermen I talked to actually know about the existence of these folktales. Some of the older men remembered these stories being told when they were children but said they were not taken seriously or believed to be true.[7] It could be said that we are dealing with some kind of a hidden cultural grammar, manifested both in these old folktale as well as in modern Icelandic culture. Speakers do not have to be aware of the structure of the language they speak. Thus it is up to the grammarians (the anthropologists) to find out and describe the grammar (*langue*) of the cultural talk (*parole*). The question is: "Can anthropological interpretations be valid if they imply meanings that actors do not know?" (Crick 1982:299). I think they can in many cases and it does not necessarily have to be an arrogant (the natives being "imprisoned by culture") view (Durrenberger and Pálsson 1989; Ingold 1986).

Up to now I have discussed the anomalous and boundary breaking attributes of seals in Iceland in the context of classification and cognition. But that is not enough. The symbolic content of seals is to be found in other factors, namely in the animal's wider cultural context, just as Jew's abhorrence of pork cannot be understood simply as a function of the animals anomalous position in the dietary rules in Leviticus xi (Douglas 1978). Pigs were singled out as particularly revolting after the Jews' oppressors had committed terrible acts of cruelty on the leaders of the Jews who would not give in and eat pork as a sign of their submission. Therefore:

> ... after such historic acts of heroism, no wonder the avoidance of pork became a specially powerful symbol of allegiance for the Jewish people and so attracted the later hellenizing exegesis that looked to the moral attributes of the pig. Whereas this symbol in origin owed its meaning only to its place in a total pattern of symbols, for which it came to stand, as a result of its prominence in persecution (Douglas 1978:62).

But what does this have to do with Icelandic fishermen's attitudes towards seals? Most of them feel that foreign animal welfare and environmental movements have attacked their way of life and basic assumptions about nature as a resource. "Greenpeacers" of any kind are very unpopular in Iceland. That has a complex history which I will only sketch briefly here. Icelandic whaling has been met by environmental organizations such as Greenpeace International and the Sea Shepherd Conservation Society with action which includes campaigns for the boycott of Icelandic fish products, costing Icelanders large sums of money, and more drastic activities like the sinking of Icelandic whaling boats.[8]

The general view that fishermen have of environmental organizations is that they consist of vegetarian fanatics who earn their living in a protest industry. They have no understanding of the importance of sea mammals for nations such as Iceland and they do not care. These animal friends are doing their best to make life in the North impossible. The only thing they think about is getting

more money from ignorant and useful foreigners in order to kill off Icelanders, Inuits and other people who live off what nature has to give. To surrender and to give in to fanatical eco-warriors (who soon might get the idea to forbidding us to kill the cod we live off) is impossible for a proud nation. Foreigners have no right to meddle in our affairs.[9] One fisherman put it like this:

> These greenpeacers think that all people can live by eating grass. But they are wrong. Man has always had to kill to survive. They will forbid us to kill the seals and whales they love so much and they will not stop at that. Why shouldn't a cod also enjoy it's civil rights!

The response of Icelanders to the pressure of anti-whaling campaigns is very much like that of Newfoundlanders with regard to the protest against sealing:

> Newfoundlanders, on the other hand, do not perceive the protest in light of environmental degradation, but as a direct threat to their traditional way of life and economic welfare ... whereas only a few hundred men engage in the ship-based hunt each year, the conflict is perceived as a threat to all Newfoundlanders (Lamson 1979:6-7).

The central issue here is the clash or difference in that part of world view that has to do with basic assumptions about nature. The attitude of Icelandic fishermen towards animals is basically anthropocentric and utilitarian. Animals and nature in general exist to be a benefit to man.[10] The following quote sums up this view:

> The fundamental concern of the utilitarian attitude is the practical and material value of animals. A basic presumption is that animals should serve some human purpose and, thus, be sources of personal gain. This attitude is largely people oriented; animals are desireable only insofar as they produce some tangible advantage or reward. This attitude does not necessarily result in indifference or lack of affection for animals, but emotional considerations are usually subordinate to more practical concerns (Kellert 1988:143).[11]

Organizations such as Greenpeace challenge such basic assumptions about nature. They demand a biocentric perspective, an ecological and moralistic view where man is only one part of the global ecological system. It is the utilitarian view of nature which has brought about devastating pollution and near extinction of some animal species. Greenpeace has a tough and uncompromising policy towards all those who are classified as "rapers of the earth," be they factories that release dangerous chemicals, nuclear waste at sea or whalers and sealers.[12]The whaling issue has been very important for Greenpeace, whales being one of the main symbols of the environmental movement. About that John Gulland, one of the advisors for the International Whaling Commission, has the following to say:

> Among the reasons are the sheer size of the whales themselves and the apparent simplicity of the issue itself – if we cannot preserve the whales what can we save? Whales, for these same reasons, make excellent fund raisers, probably behind only giant pandas and baby seals.

> There may no longer be urgent reasons of conservation for continued pressure to strengthen the controls on whaling, but there are sound financial reasons for groups that depend on public subscription to be seen to be active in "saving the whale" (Gulland 1988:45).

In a CBS interview in 1978, Paul Watson, who had until then recently been one of the leaders of Greenpeace, had the following to say about the profitability of the campaign against the harp seal hunt in Newfoundland:

> There are over a thousand animals on the endangered species list ... and the harp seal isn't one of them. You see, the seal is very easy to exploit as an image. We have posters, we have buttons, we have shirts ... all of which portray the head of the baby seal with tears coming out of its eyes. Baby seals are always crying because the salt tears keep their eyes from freezing. But they have this image ... they are baby animals, they are beautiful. And because of that, coupled with the horror of the sealer hitting them over the head with a club, it is an image which just goes right to the heart of animal lovers all over North America (quoted in Henke 1985:125)

Seals are certainly a very strong, effective and much used symbol for environmental, animal welfare and other such groups.[13] They have come to be symbols for nature as a whole. Save the seals, save nature.[14]

Seals have not only become symbols *for* environmentalists, but also *of* their organizations. As animals they are "good to think" as they are animals that have "provided man with a model on the basis of which he could reflect on his social universe" (Ovesen 1983:7). I would like to argue that seals in Iceland are the victims of their metaphorical role. Seals are good to think with as they, by their metaphorical role as symbols for environmental organizations, are concrete "things" which allow people to think about much more abstract concepts or processes, such as foreign intrusion into the local society. They fulfil the role of projections which:

> ... are in a sense metaphors of reality. Like metaphors, they make that which is relatively intangible, abstract, or poorly apprehended appear more concrete by likening it to something that is more directly experienced or otherwise more salient, e.g. time *flows*, love is *sweet*... (Kearney 1984:117).

Seals are very salient for the small-scale fishermen I have worked with. They are seen almost every day. Greenpeace International, on the other hand, is an organization that they learn about through the media. It is an abstract phenomenon with ways and means that are hard to understand and affect.[15] But Greenpeace although powerful and impossible to get at, is an enemy. But it is at least possible to curse the enemy's *totem* (i.e., the seal)[16]

Conclusion

For some readers this essay will probably seem strange. But that is what symbolic studies in anthropology very often are concerned with, namely behaviour and

ideas that can not be understood as rational or instrumental. In fact, as Barley has pointed out: "The simplest and most pervasive viewpoint in anthropology can be summed up as: 'this looks crazy. It must be symbolism'" (Barley 1983:10).

I would like to conclude with a tentative hypothesis: in ordinary life we all tend to go the easy way when thinking about abstract phenomena (Piaget 1972) by using metaphors and other tools to make them more concrete and comprehensible (Lakoff and Johnson 1980:109; see also Fernandez 1972:42-43).[17] In the case of Icelandic "scapeseals," an animal, a natural symbol, has been used as metaphor. The use of the seal as metaphor may be called "a strategy for dealing with a situation" (Burke in Fernandez 1972:43). The choice of metaphor was not random but grounded in the special position of the animal in the world view and economy of the people involved.

As symbols seals have many meanings. They are polysemous and thereby are like ritual symbols that "... generally derive their potency from their multivocal or polysemous nature, that is, from the fact that they combine meanings" (Levine 1984:77).

There are many questions that have been left unanswered in this essay. An important one concerns the nature of ambiguous categories. Can they, like bears in winter, lie in their cultural caves, waiting to be awakened by the spring of the right circumstances.[18] In the case of the seals it seems that environmentalists far away from this island in the North have played the role of spring.

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Notes

1. This essay is based on fieldwork in Iceland during the summer of 1989, along with my experience as a native, having grown up in the cultural house that is the stage for this study (Levine 1984). The group I concentrated on are the small-scale fishermen of an east coast fishing village consisting of some 1700 souls. The fifty or so full-time artisanal fishermen work their boats on nearby inshore fishing grounds. The boats are powered by diesel engines and range from 6 to 12 metres in length. Most are equipped with sophisticated electronic equipment to facilitate finding fish, positioning and steering. The gear consists of long lines, handlines, gillnets and bottom-seines and the fish caught is mostly cod but also catfish, haddock, flounder and other species.

2. Fishworm causes problems for many other fisheries around the North Atlantic, such as in Canada, Norway, and in the North Sea. This problem has been one of the rationales for culling seals in these areas. According to Summers (1978:95) "In Canada this process (of cleaning the fish) costs $2 million per year and in Norway it is so costly that in the worst affected areas fisheries have closed down altogether." Seal may, however, have been used by fishermen as scapegoats; at least this seems to have been the case with the Grey Seals around Britain where "there appears to be no direct relationship between the number of seals and infestations of cod worm" (Harris 1989:51). Interestingly enough, scapegoat in Icelandic would translate as *scapeseal* (*syndaselur*).

3. Small-scale fishermen have their own reasons for worrying about worm infected fish. The fact

that fish factories loose money is serious as that means they have an excuse for holding the price of fish down. But of greater concern may be the accusations on behalf of the fish buyers that the fish that is caught close to land, on traditional artisanal grounds, has a much higher frequency of worms and therefore, because of extra costs for the factories, cannot fetch a better price than it does.

4. According to Davies and Porter (1979) English fishermen thought that seals were the souls of drowned fishermen.

5. There is a logical inconsistency here. Where did the seal-women come from when presumably, and according to my biblical experts, Pharaoh's soldiers were males. It may be quite irrelevant, but according to F.E. Hulme in his book *Natural History Lore and Legend*, the Ancient Greeks also linked the seal with womankind. They had the idea that "beneath the visible exterior of the seal was concealed a woman... This belief was still current in nineteenth-century Greece" (Hulme in Benwell and Waugh 1961:16). Benwell and Waugh, seeking the origin of the mermaid myth, find it plausible that seals with their gestures and "astonishingly human expression" (ibid.:15) may well have given rise to speculations about the existence of mermaids. According to Faris (1989), writing about a Newfoundland fishing community, seals (and porpoise) are (or were when they did fieldwork 25 years ago) considered more man-like than other sea creatures and killing them inhumanely was regarded as "murder;" "... a term normally reserved for homicide and not applied to the killing of other sea creatures" (ibid.:27).

6. Whales and foxes are not spatially ambiguous but that does not mean that they may not have boundary-crossing attributes. For some people whales have intelligence superior to that of humans, a complex "culture" and social life and a language. In the future, according to those who hold those beliefs, we will be able to communicate with them. Killing such animals therefore amounts to homicide or even deicide (Lynge 1988:18). Unfortunately, in recent years the high intelligence of whales has been shown to be a myth. While the intelligence of toothed whales lies between that of a dog and a monkey (not reaching that of primates), the intelligence of baleen whales lies somewhere between that of a cow and a horse. (For a discussion about the smartness of whales and how the myth came about see Klinowska 1988). Foxes also have some human attributes connected to them as they have been and still are (by Icelandic fox hunters) considered very intelligent and capable of mental operations resembling those of humans (cf. Olafsson 1989).

7. One informant told me about Norwegians who lived in the village in the forties. They would not eat catfish, saying that catfish were the soldiers of Pharaoh. This was considered very funny by the local villagers. One Norwegian lady considered eating catfish pure barbarism. In Icelandic folktales catfish are said to be the dogs of Pharaoh's army (Sigfússon 1982:187; Arnason 1961).

8. For an excellent analysis of the meaning of the whaling issue for Icelanders see Brydon (1990) and for a description written by an environmentalist in favour of anti-whaling see Day (1987).

9. In some aspects the response of Icelanders to the interference of outsiders, "Coming here and telling us what to do and what not to do" reminds one of the case of a Swedish Scanian community, Sjöbo. Sjöbo has refused to receive refugees and immigrants and the name of the community has become a synonym for racist attitudes. Before the voting for or against taking immigrants there was a great pressure from government specialists, newspaper reporters and many others who wanted to tell the people of Sjöbo how they should think and behave. Are the Sjöboians really more racist than Swedes in general (statistics about the high proportion of people with negative attitudes towards issues such as giving asylum to foreigners are not well publicized, maybe because they are somewhat embarrassing for the ideology creating elite) or was it that the campaign which was meant to set them right which had the opposite effect. (The structural similarity between these two cases, Icelanders and Sjöboians was pointed out to me by Anita Jacobson-Widding and Alf Hornborg). Icelandic whale hunting has been compared to the atrocities of Americans during the Vietnam war, something Icelanders regard as a very far fetched and unfair comparison.

10. American sociologist Kellert has found in a study of Americans' attitudes to wildlife that: "Among animal-activity groups, livestock producers, meat hunters, and fishermen displayed an especially strong utilitarian orientation, in contrast to members of humane, wildlife protection and environmental protection organizations..." (1988:150). I may in this article have given the reader the impression that fishermen are in general harsh and cruel to animals. This is by no means the case. One fisherman (and he was not the only one) worried about the welfare of an eider dam and her young ones. The bird turned up every day with her flock for feeding in the harbour. "I'm afraid that the seagulls will get them," he commented after the feeding. A couple of days later I met this man when he was feeding his clients but now the dam had only one of her offsprings with her. "The bloody vultures have taken the rest, and there isn't a damn thing you can do," he said. He looked genuinely sad.

11. Attitudes towards nature and animals in Sweden have changed, with the changes that the society has undergone in the wake of industrialization. In the farming society "Animals, both wild and tame, were primarily an economic resource for the benefit of man, and as it is said in the Bible, they were soulless creatures and should be treated accordingly" (Frykman and Löfgren 1987:76). But in a recent study of Swedish attitudes towards the relative value of humans and animals 66 percent of those asked chose the position that "Humans and animals have the same value" (*Människor och djur har samma värde*). As an argument for this standpoint 89 percent of these 66 percent chose the proposition that "Humans are animals among other animals and are a part of the large ecological system." Sixty-five to 77 percent chose such reactions as: Animals have also souls (*själ*), animals can also be social and cultural beings like humans, they have morals, their emotions can be as rich as that of humans, they are self-conscious like humans, etc. Ninety-three percent agreed that all life has the same value. It is somewhat problematic to interpret such answers, for example what do people mean by the word *animals*? Are they talking about insects, which I think is unlikely, or are they talking about their dogs and cats? These results still raise serious philosophical problems. Can we now begin to talk about the superior moral status of mammals instead of that of Man? (Jeffner 1988:6) When a car hits a moose should the moose be taken to hospital and the people left waiting? (Bergström 1989). Only some 14 percent of those who participated found it self-evident that humans have a special value. In the light of these results it is amazing that animal welfare and environmental organizations do not have even more followers. However, the numbers are rising as can be seen by the fact that Greenpeace had already in 1987 some 95 thousand paying members in Sweden (Eyerman and Jamison 1987:32) and in 1989 had around 200 thousand members. In *Totem and Taboo* Freud mentions the tendency of children and "primitive" people to regard animals as their equals, "showing no trace of the arrogance which urges adult civilized men to draw a hard and fast line between their own nature and that of all other animals" (1983:126-127). He forgets that the Cartesian divide between humans and animals is not merely a question of maturation but is deeply rooted in the Judeo-Christian philosophical tradition (cf. Serpell 1988:122).

12. It is ironic that Greenpeace as an organization that fights against the use of nuclear energy (Greenpeace 1986) has with its campaign against seal hunting had similar catastrophic consequences for the Inuits as the Chernobyl accident has had for the Sami people. (For literature on the Chernobyl accident and the Sami see Beach 1989; Paine 1987. On the harp-seal controversy and Inuits see Brody 1987; Lynge 1988; Fægteborg 1986; Wenzel 1978; Smith and Wright 1989; Henke 1985 and Ingold 1988. On the consequences for Newfoundlanders see Andersen 1990; Wright 1984; Henke 1985 and Busch 1985).

13. In a recent *Time* article about David McTaggart, the leader and personification of Greenpeace International, McTaggart is pictured on a full-page photograph lying in a very seal-like position on a beach. But it might of course be a coincidence. Being a poor communicator, according to himself, he gives a short outline of his activistic philosophy: "I really don't have any morals. ... You've got to be prepared to keep No.1 thing in mind: you're fighting to get your children into the 21st century, and to hell with the rules" (Brand 1989:44). According to McTaggart "there is a global war going on, and if you can't fight, you're not going to have much of a negotiation" (ibid.:46). McTag-

gart's use of metaphor is noteworthy (environmentalism as WAR), especially if that is a metaphor he lives by (Lakoff and Johnson 1980) and perceives the world through. But wars most often consist not only of heroic deeds but also of pain and destruction (see footnote 12).

14. In the 1988 general elections held in Sweden seals played a major role as a symbol for environmental issues. Politicians, especially the Green environmentalists, who turned out to be the relative winners of the elections, spent much time discussing the deteriorating milieu of these animals. The Baltic Sea, which makes most of Sweden's coastline, has the most polluted sea water in the world and most of the seals on the coastline will not whelp as they are infertile as a consequence of the pollution. For a nation with impotent and dying seals who have become a symbol of nature it must be unacceptable that a nearby nation actually kills seals for the purpose of gain. Incidentally, in 1988 there was considerable debate about the Norwegian seal hunt off Jan Mayen. In Swedish media the hunt was pictured as inhumane and the seal hunters presumably subhuman monsters, skinning the seals alive. That scene had been shown on Swedish TV, appearing in a film about the Norwegian seal hunt. However, the same scene seems to have been used 10 years ago in a film about Canadian subhuman methods of killing seals. The Swedish King participated in the debate, condemning any brutal methods being used to kill seals. This debate escalated somewhat with various insinuations about the humanness of Norwegians and the competence of the Swedish royalty. This media furore may well reflect an underlying tension or value difference between Sweden and Norway. But that is another story.

15. As is common with fishermen (Acheson 1981:277) Icelandic small-scale fishermen are outsiders in the political arena, both at the local level of community council and also national politics. They are simply away when meetings are held and decisions taken. This fact gives many of them a sense of powerlessness when it comes to fighting for their interests.

16. Seals are totemic in the sense that they are "sacred, protected, cherished, and most significantly, even viewed as ancestors. They can be worshipped as gods" (Midgley 1984:110). It might be said that seals are synecdochial gods. Nature is the God to be worshipped and seals are the symbols by which Nature is represented.

17. "... the less clearly delineated (and usually less concrete) concepts are partially understood in terms of the more clearly delineated (and usually more concrete) concepts, which are directly grounded in our experience ... the tendency (is) to understand the less concrete in the terms of the more concrete" (Lakoff and Johnson 1980:109).

18. These are important questions but little discussed within anthropology (see, however, Jacobson-Widding 1978 and 1984).

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Farming the Edge of the Sea

The Sustainable Development of Dutch Mussel Fishery[1]

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ABSTRACT Throughout the world, there are myriad examples of abuse, overexploitation, or even depletion of living marine resources. Instances of successful fisheries management and sustainable use are rare. One such example is the Dutch mussel fishing and farming industry. During well defined periods in spring and autumn, the mussel fishers are allowed to catch young mussels, which they plant on plots rented from the state. This system has been in operation since the 1860s. The present paper explores the history of the mussel industry, points out the ecological, economic and social consequences of privatization of the marine commons, describes successive types of management regimes and discusses some of the merits and demerits of privatization.

Introduction

There are numerous examples of "tragedies of the commons" (Hardin 1968) which menace fish stocks and fishing industries in many parts of the world. Marine biologists and economists widely accept that resource abuse is inevitable under a system of common property tenure. They point out that fishers who enjoy unrestricted access to fishing grounds seek to maximize their profits in the short run. Fishing, they argue, is a zero-sum game in which one man's gain is another's loss (cf., e.g., Anderson 1976; Gordon 1954; Pontecorvo 1967; Scott 1955). The pessimistic message of the theorem is that "[r]uin is the destination toward which all men rush, each pursuing his own best interest in a society that believes in the freedom of the commons" (Hardin 1968:1244).

In recent years, the assumptions underlying this proposition have been criticized (cf., e.g., McCay and Acheson 1987; Berkes 1989; van Ginkel 1989a). The gist of the critique concerns the implicit understanding that commons are inherently open access, inevitably lead to maximization of short-term self-interests and, hence, to abuse. These assumptions often do not hold true. Anthropologists and ecologists, for instance, have presented case studies which show that there are many past and present instances of viable common property regimes characterized by communal management and sustainable use (cf., e.g., Ruddle and Akimichi 1984; Ruddle and Johannes 1985; McCay and Acheson 1987). Nonetheless, it is generally understood that tragedies of the commons are likely to occur when access to fishing grounds is entirely open to all and when marine resource exploitation is not managed in some way or other by the users, by external authorities, or by a combination of both.

In response to current crises in the exploitation of the commons, there is a growing awareness that we need to develop modes of sustainable resource use.

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In attempting to do so, we do not have to start from scratch: there are many common property management practices that contribute to the continuing sustained use of living resources. A careful analysis of the knowledge and social arrangements upon which they are based can yield valuable information which may pave the way for the development of sustainable resource use on a larger scale.

This paper describes a successful common property management regime: the Dutch mussel fishing and farming industry. It focuses on how it evolved from a capture fishery into culture fishery, or how "plunderers" became "planters." It explores the history of the mussel industry, the way it was and is managed by state officials and participants, and the successes and setbacks it has encountered. In addition, the merits and demerits of this resource management system are discussed. Most of the data relate to the province of Zeeland, and to the town of Yerseke in particular. Yerseke is the country's foremost centre of shellfish cultivation and trade.

The Setting

Zeeland is a province in the south-west of the Netherlands. Several inlets and estuaries indent its coastline and divide its territory into islands and peninsulas. Nowadays, the major local fishing grounds can be found in the Eastern Scheldt. The mouth of the sea-arm is protected by a storm-surge barrier, which can be closed during severe gales, but which under normal weather conditions maintains the tidal regime. The inlet penetrates approximately 48 kilometers inland from the North Sea. Its tidal range averages 3.2 meters. The large intertidal zones and intersecting deeper channels provide rich econiches, where many species of fish and shellfish abound. The firm seabed of the shallow flats, the constant water salinity, the moderate velocity, and an abundant food supply of phytoplankton form excellent conditions for the spawning and growth of the common blue mussel (*Mytilus edulis*). Similar ecological conditions can be found in the western part of the Wadden Sea, situated between the mainland and the Frisian Islands of Texel, Vlieland and Terschelling, some 200 kilometers to the north of the Eastern Scheldt. Since the 1950s, this area has also become an important mussel fishing and farming location for Zeeland shellfish planters.

Over 70 per cent of the national mussel harvest, which exceeds a hundred million kilograms per year, is exported to such countries as France, Belgium, and Germany. The Dutch mussel industry contributes more than 30 per cent of European production, which makes the Netherlands the largest mussel producing country in Europe. All important shellfishing communities are situated in Zeeland. They are Bruinisse, Tholen, Zierikzee and Yerseke.[2]

Yerseke is an affluent community, located on the south bank of the Eastern Scheldt. The town's favourable position near urban markets and a good communication network with the hinterland have contributed to its rise as a nucleus of maritime enterprise. The town has a population of approximately 5900. Its economy is dominated by mussel and oyster culture and trade. There are 80 mussel firms and companies in the Netherlands, 36 are based in Yerseke. The processing and marketing of the bivalves is almost entirely concentrated in this town. There are six mussel canneries and twenty-odd shellfish processing and packing plants. A dozen of these companies are vertically integrated, i.e. combine farming, processing and shipping. Other maritime pursuits, like shrimping, lobstering and cockle fishing, also provide an important source of local employment. Yerseke harbours the country's second largest fishing fleet. It consists of a 112 diesel-powered boats, ranging from 17 to 40 meters in length. Each mussel vessel is equiped with two or four dredges and manned by two to four crewmen. A large percentage of Yerseke's occupational population depends directly or indirectly on the fishing industry for its livelihood. In 1980, for example, it provided employment for nearly 700 men and women.

Mussel Fishing and Farming Methods

Mussel farming is practised on rectangular parcels of seabottom, which vary from 2 to 12 meters in depth during high tide. The corners of these plots are marked by stakes. Each firm rents a number of such plots in the Eastern Scheldt and the Wadden Sea from the Crown Land Office (*Domeinen*). Access rights are exclusive. The average size of plots in the Wadden Sea is 25 acres, and in the Eastern Scheldt 11 acres. An area of 6000 hectares is available for mussel cultivation in the Wadden Sea, in addition to 1400 hectares in Zeeland waters.

Mussel farming in the Netherlands is a semi-culture. The reproduction of mussels is left entirely to nature. The seed fishery, carried out during a well-defined period of some weeks in spring and autumn, forms the basis of cultivation. The Ministry of Agriculture and Fisheries sets the opening and closing dates of this short season. During this period, the musselmen are allowed to dredge seed and young mussels on grounds assigned by the Ministry. The natural beds are productive enough to permit seed fishing from year to year. It is of paramount importance that the fishermen catch a sufficient amount of seed to stock their plots. As one skipper-owner stated: "It is a nerve-racking time. Everything has to be in perfect order: the vessel, the motor, the gear, and the crew, 'cause if I were to miss part of the seed fishery, the entire season would be lost. Sometimes I worry so much about it that I cannot sleep at night." The musselmen tremendously enjoy the competitiveness of what they consider to be a "truly free" fishery. If they have located a good spot, they will not share this information with colleagues in order to monopolize it as long as possible. Usually, however, other crews soon find out and make sure that they get their share. It is no exception that dredges and lines get entangled because several boats crowd a small, but rich niche, especially when seed mussels are scarce.

The musselmen usually plant the young bivalves on the shallowest plots they rent. There is a shortage of deep grounds. When winter sets in, the mussels are dredged up and deposited on deeper beds to stimulate growth and to prevent them from being washed away or covered by sand due to storms. The mussels mature within two years. They are dredged up again and brought to the mussel-auction in Yerseke. The mussel dealers and canneries who buy a ship's load plant

the molluscs on special plots with a firm peaty bottom for at least ten days so that they can dispose of sand and silt. This self-purification process is a crucial step before the bivalves are marketed. The only suitable underwater grounds for this procedure are located just off the shore near Yerseke. The dealers also lease these beds from the state.

Marine Commons and Maritime Commoners

Shellfishing in Zeeland is at least 7000 years old. Yerseke's history as a maritime community is, however, relatively recent. As late as the 1860s, its economic resource base was still mainly agricultural. The village was even landlocked until the 1530s, when floods washed away large areas of South-Beveland's territory, turning Yerseke and the hamlet of Yersekedam into coastal communities. The sea-change was, however, not solely destructive. It also provided new opportunities for the exploitation of marine resources. In 1784, official documents refer to the local shellfish fishery for the first time. The firm peaty seabed which had developed off Yerseke's coast provided an excellent base for the settlement and growth of oyster spat and mussel seed, which clustered into vast shellfish banks.

Fishermen from nearby villages started to exploit these banks. Even in the still predominantly agrarian village of Yerseke, some enterprizing inhabitants began to switch between agriculture and fishing. They used flat-bottomed boats of types called *hoogaarzen* and *hengsten*. Such craft had two or three crew members, usually agnatic kinsmen. Others, especially male and female farm-hands, gathered oysters (*Ostrea edulis*), mussels, periwinkles and whelks when the receding tide left vast areas of tidal flats exposed. They walked out onto the banks and harvested shellfish to earn extra income during the winter months, when farm work was slack. However, the majority of villagers remained land-oriented.

Though all Zeelanders and "foreign" fisher folk held equal access rights to the common property marine domain, *de facto* entry to its resources was often limited because local fishermen claimed customary rights over the shellfish beds near their residence. Sometimes they even used violence against outsiders who fished on "their" grounds (van Ginkel 1988, 1989b). This "culture of the commoners" (McCay 1987) notwithstanding, occasionally more than 200 vessels crowded the most productive niches. Hence, the menace of overexploitation, especially of oyster stocks, loomed large.[3] A report described the state of affairs in the Zeeland fishing industry during the first quarter of the nineteenth century as follows:

> In those times disorder prevailed. Each fisherman acted according to what his greed or rapacity dictated. It happened more than once that armed fishermen from one place set out to rob the beds over which those of another place claimed exclusive rights. Thus, the fishing grounds were often the scene of bloody meetings, which regularly necessitated the intervention of armed forces and eventually compelled [the authorities] to introduce regulations to counter the disturbances (Verslag 1863:22).

In 1825, the government assigned the management of local waters to the Board of Fisheries for the Zeeland Streams (*Bestuur der Visscherijen op de Zeeuwsche Stroomen*), in an attempt to change the situation for the better. The Board consisted of impartial notable citizens, who had no stake in the fishing industry. When it became clear that the natural shellfish beds faced gradual depletion if no measures were taken, the Board regulated fishing-gear and methods, seasons, minimum sizes of marketable shellfish, demanded a modest licensing fee and patrolled the waters to enforce these rules. This state intervention was supposed to stop overfishing, but poaching and fishing illegally became a widespread phenomenon. Sometimes this caused conflicts among fishermen. Crews fishing off-season, for example, were confronted by colleagues who tried to prevent "their" shellfish beds being plundered by non-locals before the season started. Thus, the new regulations could not prevent depletion of natural shellfish beds continuing.

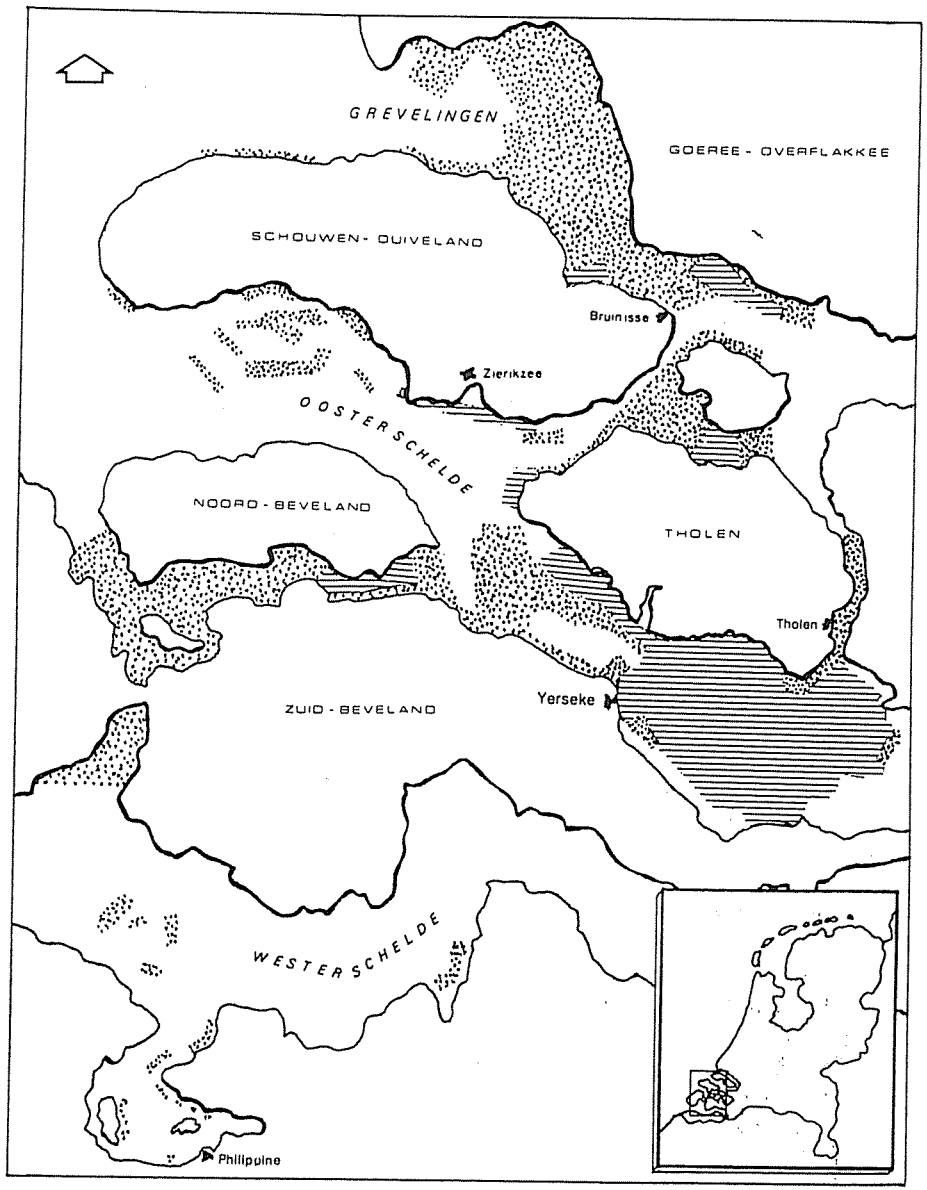
By the 1860s, hundreds of shellfish fishermen and gatherers exploited the Zeeland estuaries, providing a meagre subsistence to many households. Though the monetary rewards were small, the fishing industry expanded due to demographic growth in the province, which could not be absorbed by employment in agriculture. Yerseke's population, for example, increased from 560 in 1817 to nearly 1000 in 1867. Many took to fishing and during this same span of time the local fleet expanded from 10 to 24 boats. In addition to the crewmembers, the village had some forty boatless shellfish gatherers. In spite of the growth of its maritime sector, Yerseke was one of the poorest fishing communities in the country. Scores of villagers found themselves in dire straits and had to be assisted by poor-relief boards. The widespread poverty was closely linked to the undependability of the market, a shrinking supply of shellfish due to resource depletion, and vehement competition. However, Yerseke would soon become the scene of radical transformations spurred by the enclosure of large parts of the marine domain. The privatization of oyster beds, in particular, brought about sweeping changes, not only in the oyster trade, but in the mussel industry and in the larger community, as well. In the next section, I shall therefore also briefly refer to the far-reaching consequences of privatized tenure in oystering.

Enclosure of the Commons

In the 1860s, the Board of Fisheries privatized several mussel banks in the Eastern Scheldt and other Zeeland waters. The Board demarcated plots and allocated these for the duration of ten years to musselmen by the drawing of lots. It also provided for police patrols to prevent theft and poaching. Henceforth, mussel fishermen gained exclusive access rights in return for a modest rent of a few florins. The plots were reallotted ten-yearly. Capture fisheries gradually turned into culture fisheries, though there were still grounds where a free mussel fishery was permitted. The transition from fishery to semi-culture led to an increase in output, but did not cause dramatic changes in the social structure of the occupational community of musselmen and labour remained the most important factor of

production. A transition from free oyster fisheries to oyster farming did, however, have a tremendous impact upon the social relations of production.

In 1870, the state privatized several oyster banks in the Eastern Scheldt and



Map 1. *Mussel and Oyster Farming Locations in the Zeeland Streams, c. 1890 (Mussel Areas Are Indicated by Dots, Oyster Areas by Stripes)*

other Zeeland estuaries. Extensive underwater grounds were divided into five and ten hectare plots, which could be leased at public auctions. The highest bidders gained exclusive access rights. This measure attracted many wealthy urban capitalist entrepreneurs and this in turn brought about a rapid capitalization and industrialization of the oyster industry (van Ginkel 1988, 1989b, 1990). Shellfishing rapidly gave way to mariculture. By 1886, all banks suitable for mussel and oyster farming were privatized (see map 1).

Within decades Yerseke became the Dutch centre of oystering. Most of the newcomers to the industry established their firms and companies in Yerseke because in 1866 the town was connected to an international railway network, contrary to most of the other important Zeeland shellfishing communities, such as Bruinisse, Zierikzee, Tholen and Philippine. The town received a huge fillip from the spread of railways and the boost to consumption provided by the steadily improving standard of living at home and abroad. In the wake of this development the village turned into a relatively affluent town which attracted many migrants. By 1895, its population had more than quadrupled to 4338 and the local fleet had expanded to a 160 boats, including ten steam-powered vessels.

The new mode of production in the oyster industry initially resulted in a loss of independence of the existing oystermen. Most of them could not afford to pay the lease fees, which skyrocketed soon after the introduction of the auctions. They either became wage-labourers for one of the newly established companies

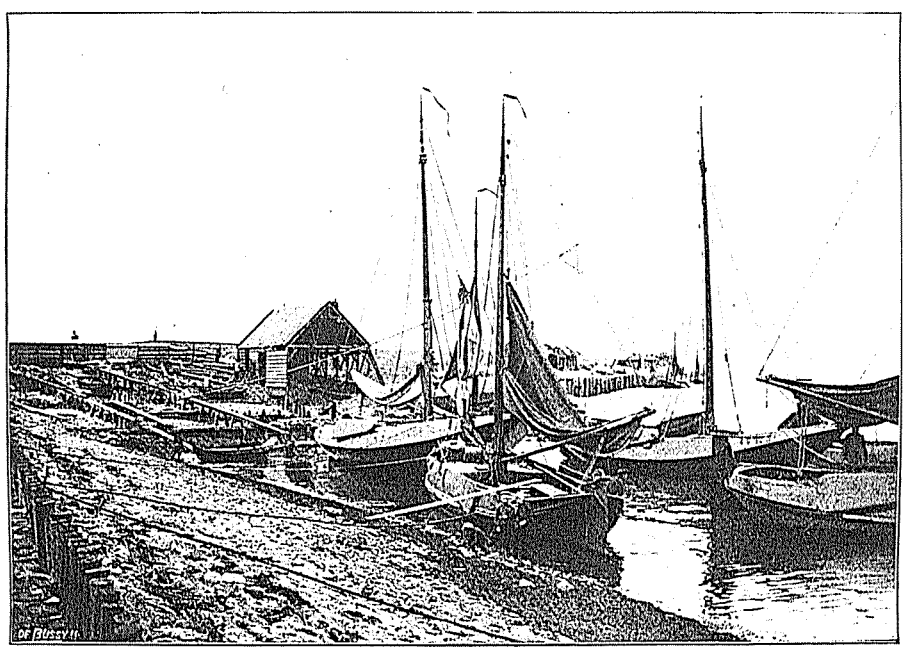


Photo 1. *Flat-Bottomed Boats Moored Near One of Yerseke's Shipyards, c. 1890*

or oyster barons, or turned to musseling (van Ginkel 1988). The gatherers, whose domain was drastically reduced, did not have the latter possibility. The majority had to get a job in the oyster industry. After an initial period of remarkable successes, the oyster trade suffered serious setbacks. The employees constituted a disposable labour force and many were sacked.

Compared to oyster culture, musseling was far less labour and capital intensive. The required means of production still consisted of a boat and relatively inexpensive gear. The fees for the rent of mussel plots remained modest. In contradistinction to the oyster trade, the mussel industry did not undergo a phase of rapid capitalization because the monetary rewards were smaller and plots were not up for public bidding but allocated by lot. Besides, a free mussel fishery was permitted in the Zuyder Sea and Wadden Sea.

Initially, however, the allocation of plots by the drawing of lots led to abuse. Anyone could take part in the draw. Thus, many non-fishermen tried to lease a plot with the sole objective to sublease it to a musselman for a profit. In the early 1900s, this abuse ended when the Board of Fisheries raised the lease fees and decided that only mussel planters could participate. Later, the lease contract was automatically renewed unless the culturists wished to end it.

Following the growth of the oyster industry, the number of musselmen also increased. Given the lower capital investments required, many former oyster fishermen, labourers and newcomers turned to musseling. Whereas the oyster industry became strongly stratified, the occupational community of musselmen remained fairly egalitarian. All mussel fishermen operated independently in family firms, possessed similar means of production, and had equal opportunities to rent plots by participation in the drawing of lots. Even though the profits were considerably smaller than those that could be obtained in oystering, those who possessed little money but valued their independence became musselmen. Since the vessels were still relatively small and cheap, it was feasible for every crew member, given reasonable luck, arduous labour, and a degree of thrift, to aspire to own his own boat. Turn of the century Yerseke counted approximately 90 musselmen, and several fishermen who also fished oysters, lobsters, crabs, periwinkles and whelks. Not only were they small commodity producers, many were fish mongers, too. They sailed to Belgian cities like Antwerp, Brussels, Ghent and Mechlin and sold their catch to merchants, market vendors and peddlers. Each year, they exported 20,000 to 30,000 tons of mussels this way.

In the early decades of the twentieth century, vehement competition for a share of the market resulted in continual overproduction. A similar process had also occurred in the oyster trade. Given the imbalance between supply and demand, prices dropped. As a result, most musselmen tried to increase production to maintain or improve their standard of living. This solution to the "peasant dilemma" (Wolf 1966:15) only exacerbated their situation, of course. Things became even worse when due to the motorization of the fleet the supply of mussel seed shipped home from the Wadden Sea increased. Many musselmen quickly adopted the new technology of mechanical power.

During the First World War, export became increasingly difficult. Though the

Dutch were neutral, the acts of war and restrictions imposed by the occupying German authorities in Belgium hampered free trade. A boom in the home industry of cooking, shelling, salting and bottling mussels, slightly alleviated the problems. By this time there were also two mussel canneries which processed considerable amounts of bivalves. After the war ended, a rise of the rent fees, unfavourable exchange rates, and declined purchasing power in Belgium and France created additional problems for the musselmen. A contemporary report mentions that "mussel fishery is in a bad state. Some fishermen blame the exchange rates, which is partly true, but the main cause is that mechanical power cannot sustain the fishery. Motors are installed in ever more boats because without them the fishermen are unable to compete" (Verslag 1921:106). Motorization and the introduction of mechanical dredges caused an increase in supply and a concomitant fall in prices. Early innovators were at an advantage over those who continued to use sailing boats. This was especially true for the seed fishery and the trade with Belgium. There was growing antagonism between those with and those without motorized craft. The latter requested a ban on the use of mechanical power in the seed fishery, to no avail, however. Some even feared that a few wealthy persons would monopolize the mussel trade and that they would oust the small planters from the fishery. Most petty fishermen, however, responded in time and also motorized their sailing craft. Thus, in 1932, a biologist could still observe that "mussel farming is exclusively a small-scale enterprise" (Havinga 1932:58).

On several occasions the mussel culturists tried to reverse the industry's im-

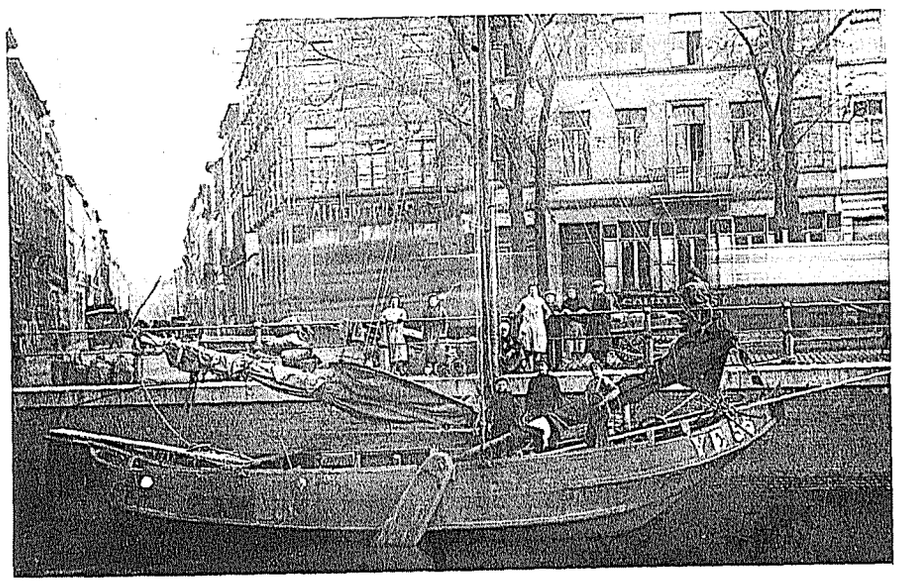


Photo 2. *An Yerseke Skipper and His Two Sons Aboard Their Vessel (a* hengst*), Landing Mussels at a Quay in Brussels, c. 1925*

pairment. They established co-operatives and unions which introduced quotas, quality standards and minimum prices. However, these measures failed time and again because there were always mussel farmers and shippers who did not join, or refused to live up to the voluntary regulations. In 1917 and 1927, for instance, unions of Zeeland mussel planters (both named *Bond van Zeeuwsche Mosselkweekers*) were established on the initiative of Yerseke and Bruinisse musselmen. Both were liquidated within a few years. The problem was that several planters who did not join sold their mussels under the minimum prices set by the unions. Moreover, some members evaded the regulations by furtively selling more than their quota, while at the same time trying to benefit from the improvement in prices. These "free riders" favoured their own private interests above those of the mussel industry as a whole and, consequently, underminded any attempt at production and marketing management. Through the 1920s, overproduction, low exchange rates and low prices continued to weaken the industry. Though there were also some good years, a growing number of small planters had to ship the bivalves to Belgium themselves to earn extra money.

State Management of the Mussel Industry

In the 1930s, the state finally gave up its *laissez-faire* policy and intervened in the ailing industry to control the disrupting consequences of the general economic crisis. In 1934, it issued the Mussel Crisis Measure, (*Crisis Mosselbesluit*). This management regime finally introduced the measures which organizations of musselmen had also proposed, but were unable to enforce. All mussel fisherman and dealers had to join the Dutch Fishery Marketing Board (*Vischerijcentrale*). The Board set minimum prices for mussels for export. The home market remained free, however. Soon Belgian dealers started to work with Dutch middlemen to evade the price regulations. To counter this situation, the Central Sales Bureau of Mussels (*Centraal Verkoopkantoor van Mosselen*) was established in 1935, partly at the insistence of the planters, who suffered most from the evasion of the price regulations. Henceforth, all transactions between planters and shippers had to be made via the Bureau. Subsequently, it set quality standards and introduced fixed prices, both for mussels the Bureau bought from the producers and for the bivalves it in turn sold to the dealers. Moreover, it regulated the admittance of newcomers in order to curb the expansion of the number of mussel culturists and introduced a licensing system for shippers, thus reducing the number of musselmen who were allowed to ship their own merchandise.

The management regime was still not quite successful; soon a new boom in output followed. In 1938, the Bureau responded by allocating production quotas, so-called standard capacity numbers (*standaardcapaciteitscijfers*), to all individual musselmen, based on their estimated production in earlier years. Alternately, each planter was allowed to supply a certain quota to the Bureau. This rigid regulation of the industry, aimed at balancing supply and demand, proved adequate and the position of the planters improved. It had a stabilizing influence, though it also brought about a fixation of the industry's structure and

limited the expansion of individual firms. The standard capacity numbers were fixed and non-negotiable. The only way to expand a firm was by buying another firm. The number of musselmen who kept sailing to Belgium started to diminish, not only due to restrictions imposed by the Bureau, but also because the transportation of bivalves was gradually taken over by trucking companies.

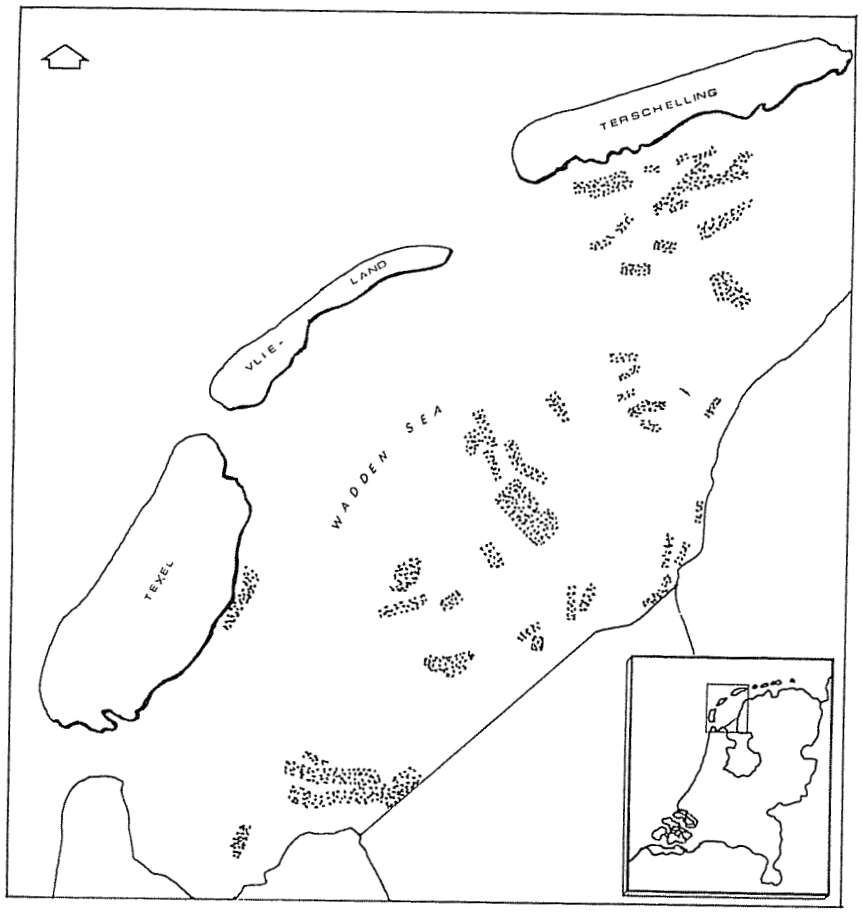
When the mussel industry had hardly recovered from the crisis of the 1930s, the Second World War broke out. Many boats were confiscated, damaged or destroyed, fuel was scarce, export made impossible and several Yerseke fishermen were forced to work as convicts on the German island of Wyk auf Föhr. Production came to a near standstill and the Germans demanded the best part of the landings.

After the war ended, the Dutch government reduced the rent of plots to stimulate the industry's recovery. Nonetheless, this was a difficult time, due to the damages inflicted upon the fleet. Following two good years, things appeared to get even worse. In 1950, a parasitic copepod, *Myticola intestinalis*, killed a large proportion of Zeeland mussels. Some musselmen lost over 80 per cent of their stock. The shippers were consequently unable to supply customers. The planters and dealers were powerless against this ecological disaster and feared that it presaged the end of musseling in Zeeland.

Expansion and Co-Management

Paradoxically, however, this catastrophe preluded a phase of capitalization and expansion. Some enterprising planters gained permission to cultivate plots in the Wadden Sea, until then a location mainly used for seed fishing (cf. van Ginkel n.d.). Soon all Zeeland musselmen relocated parts of their production areas to the Wadden Sea (see map 2). Moreover, the mussel parasite vanished from the Zeeland inlets within a few years. Thus, there was an enormous expansion of the total available area of plots, which gradually increased from 4,000 to 10,000 hectares.[4] Since the demand for mussels had also risen, the Bureau considerably extended the individual quotas.

In 1967, some of the most successful planters and dealers persuaded the Ministry of Agriculture and Fisheries to withdraw most of the protective measures which had been introduced in the 1930s. The quota system was abandoned and henceforth mussels were sold at a free auction in Yerseke. This did not imply that the industry returned to a *laissez-faire* situation. The state has retained formal jurisdiction over shellfish grounds, still polices the waters, monitors the sanitary condition of shellfish farming areas and finances a department of the Netherlands Institute for Fisheries Investigation in Yerseke, which carries out biological research and provides the shellfish farmers with information and advice. However, the involvement of the industry's participants has increased. The Industrial Board of Fisheries (*Produktschap voor Vis en Visprodukten*), an organization of the fishing industry as a whole, together with representatives of all branches of the mussel industry – planters, dealers and canneries, united in the Mussel Advisory Committee (*Mosseladviescommissie*) – now determine



Map 2. *Mussel Plots in the Wadden Sea, c. 1960*

quality standards and maintain minimum prices. A fund (*Mosselfonds*) was created to facilitate this. The planters deposit a small percentage of each sale with this fund. If their mussels do not meet with the quality standards, or cannot be sold for at least the bottom price, they are compensated by the fund. The mussels are bought by the fund, planted on plots and sold at a later date. Thus, this system is quite flexible. The Industrial Board and Advisory Committee also negotiate with the Ministry of Agriculture and Fisheries regarding the replacement of plots which have become unproductive, for example due to silting. In general, this co-management regime has been successful so far. Production has boomed, but supply could not keep up with demand and, concomitantly, prices have increased sharply (see figures 1 and 2).

However, there were also disadvantages. The expansion of mussel farming in the Wadden Sea was at the expense of shrimp fishermen in the north of the country, who saw their shrimping territory drastically reduced. Some fishermen from

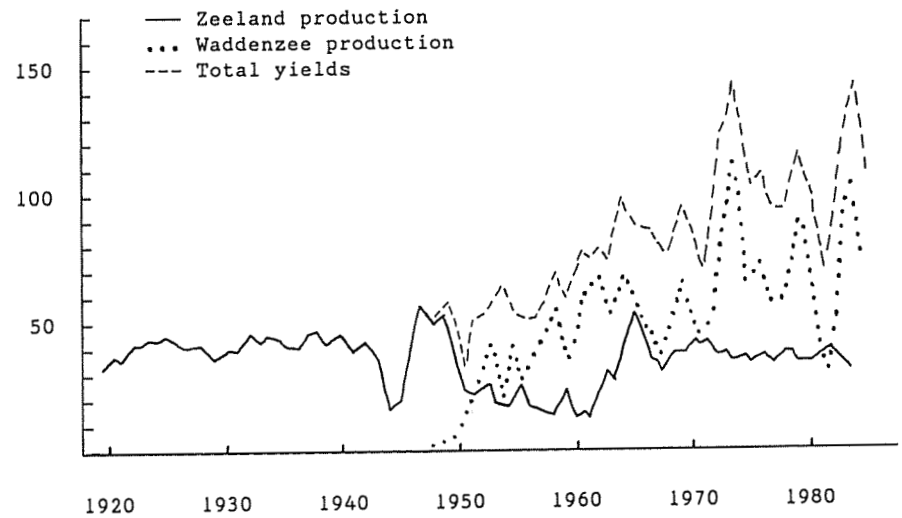


Figure 1. *Yearly Yields of Marketable Mussels (in Millions of Kilograms)*

the island of Texel, for example, tried to gain permission to rent plots in order to start mussel cultivation, too. Their efforts did not bear fruit. The Ministry of Agriculture and Fisheries refused to give them access to such plots because Zeeland mussel planters had to be compensated for a loss of mussel beds as a

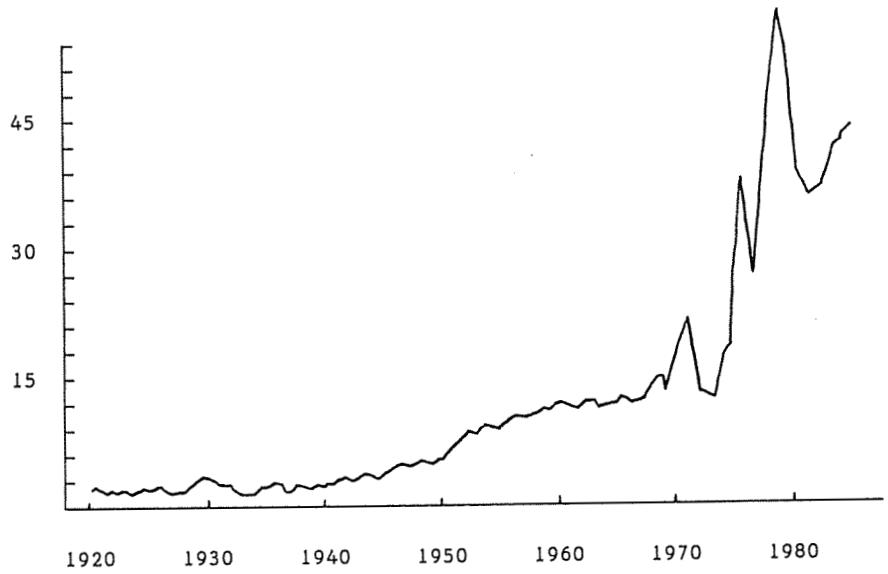


Figure 2. *Average Price of Mussels per 100 Kilograms (in Dutch Guilders)*

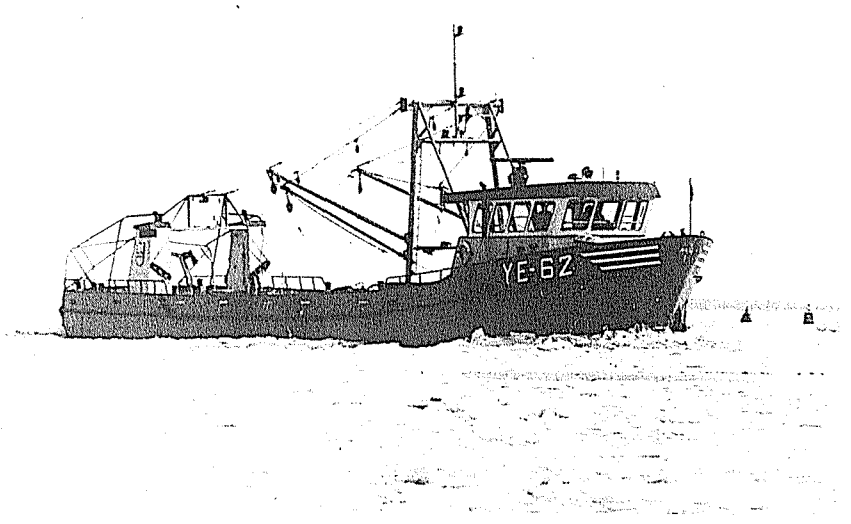


Photo 3. *Modern Mussel Cutter, 1986*

result of the damming off of the Zeeland delta (see note 4). Most shrimpers, who only received nominal indemnifications for the diminution of fishing grounds, bitterly resent the fact that Zeelanders plant mussels in what they consider to be "their" territory.[5]

There were also demerits for certain musselmen. The relocation of many production areas to the Wadden Sea meant that larger boats were needed. This changed the balance of forces of production from labour to capital. A period of rapid modernization, increases in scale and mechanization ensued. These changes worked to the advantage of the large mussel culturists and to the detriment of the petty planters, who were unable to keep pace with the process of growth because they lacked the funds to modernize. Many could no longer compete and especially those without successors had to sell their business to large-scale planters and dealers. The number of firms decreased from 143 in 1960 to 80 in 1985. This development was stimulated by the Ministry of Agriculture and Fisheries. It aimed at fewer, but more profitable enterprises. Today, the state follows a very restrictive policy with regard to the admittance of newcomers. Only those inheriting a family business or experienced employees who want to set up their own enterprise can get a license, provided that the total number of firms does not increase. Thus, the expansion of the mussel industry as a whole brought about the demise of small enterprises. Nonetheless, the industry's social organization is still predominantly based on family firms.

Discussion: Pros and Cons of Privatization

This case-history describes, among other things, several management regimes which have been in operation in the Dutch mussel industry. For ages, the mussel fishing grounds have been commons which local shellfish fishermen regarded as "theirs." However, they could claim but not enforce exclusive rights and often extralocal fisher folk incursed on "their" territory, ultimately resulting in a tragedy of the commons. The introduction of exclusive property rights by the drawing of lots in the 1860s implied a change toward ecologically sustainable development. Capture fisheries turned into culture fisheries which resulted in increased production. This management system seemed equitable since all participants had equal opportunities to rent plots. Nonetheless, abuse occurred and was only countered in the 1900s, when the Board of Fisheries decided that only musselmen could participate in the draw. Moreover, one of the shady sides of this successful development was overproduction and, consequently, a fall in prices. Thus, privatization *per se* is not necessarily the answer to all resource management problems in fisheries. The musselmen themselves established unions in order to turn the situation for the better through the introduction of quality standards, minimum prices and production quotas. Such agreements were undercut by fishermen who evaded the rules or did not join the unions established to this end. In the 1930s, the state intervened and did exactly what fishermen had tried to do earlier. Unlike the fishers, however, the state was capable of enforcing production and market regulations. This rigid management regime bore fruit and was maintained into the late 1960s. Following the expansion of mussel farming to the Wadden Sea and the capitalization of the industry, the planters and dealers asked for a relaxation of the strict regulations. The Ministry of Agriculture and Fisheries withdrew its measures, though it maintained formal jurisdiction with regard to marine property and allocation of new grounds. All parties in the mussel industry participate in management through the Mussel Advisory Committee and the Industrial Board of Fisheries. So far, this co-management system has worked well, at least in ecological and economic respects. It has led to increased production at an ecologically sustainable level and higher incomes to musselmen.[6]

Can similar management systems work elsewhere? I think they can. When carefully planned and introduced, mariculture could perhaps provide a solution to *resource* management problems.[7] This does not necessarily mean that the marine domain has to be privatized; state or communally managed shellfish resources, or a combination of management regimes, may be viable alternatives. Whatever the details of such a tenure system are, it seems a sound strategy to introduce some form of exclusive access to sedentary fish stocks in order to develop ecologically sustainable fisheries or mariculture. However, there are many problems involved and social costs have to be considered, as well.

Firstly, it will be difficult to introduce exclusive access rights to fishing grounds, because this will render multiple-use impossible. There are conflicting interests between mariculturists, on the one hand, and commercial and recrea-

tional fishermen, environmentalists, holiday-makers, energy (e.g., oil and nuclear) and other industries, and sewage works, on the other. The case of the Dutch mussel industry is telling in this respect: where mussels are farmed, all other forms of marine resource exploitation are prohibited. Since the 1950s, with the expansion of mussel cultivation to the Wadden Sea, the musselmen have taken up much space formerly mainly exploited by shrimpers.[8] This has led to frictions and conflicts because the latter felt that the mussel farmers had encroached on "their" territory.

Secondly, there may also be different perceptions of property which can lead to poaching. Thus, McCay writes that in the U.S.A., the history of eastern seaboard oystering shows "the persistence of the sentiment or culture of the commons even in the context of a strong rationale for a privatized fishery" (1987:208). Her case history bears a family resemblance to what happened shortly after the enclosure of the Zeeland commons. It is not easy to turn fishermen into "farmers." Even when fishermen are in favour of a privatized fishery, poaching and theft can occur. For instance, Zeeland mussel farmers still claim that mussels are fished illegally from their plots and that there is fraudulent displacement of seamarks. Policing the waters is a dear necessity, even though it will never be entirely effective.

Thirdly, privatization often leads to marginalization of the commoners (cf. van Ginkel 1990; McCay 1987; Taylor 1983). It further protects the interests of participants once they have gained access and may create tremendous barriers for potential newcomers to the industry. Moreover, the example of the Dutch mussel industry illustrates that many small-scale planters were ousted from the business. These seem to be inherent inequities of an exclusive or limited entry rights system. One of the major management concerns should therefore be an equitable allocation of access rights to marine resources. However, tragic choices can hardly be avoided in finding solutions for resource management dilemmas (cf. McCay and Acheson 1987). Nonetheless, in trying to achieve ecologically sustainable development, the social problems of fishers should not be neglected. Management institutions or arrangements that fail to address this dilemma may perhaps solve the tragedy of the *commons*, but at the same time they will certainly contribute to the tragedy of the *commoners*.

Conclusion

The present paper shows that the introduction of exclusive entry rights can provide fishermen with incentives not only to maintain, but even to increase their harvest at an ecologically sustainable level. This conclusion is perhaps deceptive. It may create the impression that I subscribe unconditionally to at least parts of the tragedy of the commons proposition and similar theories (e.g., Gordon 1954; Scott 1955), in that exclusive access rights convey only benefits. I do not think that they do. I have already stated some of the negative aspects, but there is more. In previous articles, I pointed out that the allocation of exclusive use rights is not necessarily a panacea for resource management problems. I used

the history of the Dutch oyster industry to illustrate this point (cf. van Ginkel 1988, 1989b and note 6). Nevertheless, stationary marine resources, such as mussels and oysters, seem to offer excellent opportunities for the development of sustainable resource use under certain types of management systems. Such sedentary shellfish stocks can be assigned to specific owners or user groups (Townsend and Wilson 1987:318). The main problem is to devise equitable forms of access allocation to the resource. The introduction of individual property rights is certainly not the only possible management solution. Such resources can also be managed communally or in combination with external authorities. Sustainability, however, appears to be attainable, since the shellfish are planted on plots which provide better ecological conditions for growth and reproduction than under entirely natural circumstances and the shellfish culturists will reap the fruits of good stewardship. In the instance of the shellfisheries, "man the plunderer" can be turned into "man the planter." In this sense, shellfish farming is a viable option for the enhancement of ecologically sustainable use of renewable marine resources.

Notes

1. An earlier version of this paper was presented at the First Annual Meeting of the International Association for the Study of Common Property – "Designing Sustainability on the Commons'" September 27-30, 1990, Duke University, Durham, North Carolina. I would like to thank Jojada Verrips for his comments.

2. Several other Zeeland villages and towns also had a small musseling fleet. They could not retain their position (cf. van Ginkel 1989c). Outside Zeeland, there are only two locales in the Netherlands where a small number of mussel farmers are active today: Harlingen and Wieringen.

3. Overfishing had been triggered by the steadily rising demand and prices for shellfish, which in turn were brought about by population growth in western Europe, infrastructural improvements and increased spending power of the urban middle and upper classes.

4. In 1953, a flood disaster struck Zeeland. Five years later, the government decided to dam off all inlets but one in the province. In 1971, the Grevelingen inlet (see map 1) – an important mussel farming location – was closed off by a dam, rendering mussel cultivation impossible. The Eastern Scheldt was scheduled to be shut off from the North Sea some years later. In anticipation of the damming off of the Zeeland delta, the relocation of mussel farming to the Wadden Sea was hastened. However, growing opposition by fisher folk and environmentalists led to a reconsideration of this government decision. In 1976, Parliament approved the construction of a storm-surge barrier which would maintain the tidal regime. This meant that mussel and oyster farming in the Eastern Scheldt would remain possible. Thus, the total available area for mussel cultivation increased, though the acreage of mussel beds in Zeeland decreased.

5. This has become clear to me while doing fieldwork on the island of Texel.

6. It is Acheson's hypothesis that "where property rights exist, there would be less likelihood of overexploitation of resources, larger catches, more efficient use of capital, and higher wages to fishermen" (1981:301). Though the present case history seems to corroborate this hypothesis, I do not think that it holds true in general. In another article, I have used the history of the Zeeland oyster industry to clarify this point. Some of the consequences of privatization of oyster banks were overproduction, resource deterioration, overcapitalization, marginalization of established fishermen, the creation of social divisions and maldistribution of incomes (cf. van Ginkel 1989b).

7. An obvious prerequisite is that ecologically suitable areas, a market and a communication network must exist or have to be created. Therefore, a careful analysis of local situations should be made before attempting to introduce forms of mariculture, such as mussel farming. It should at least include a study of the consequences for the ecosystem; the sanitary condition of local waters; the chance that diseases are introduced or spread (such as MSX in oyster culture); and culturally mediated food preferences and taboos in view of marketing possibilities.

8. This seems to confirm Tuomi-Nikula's hypothesis that "[i]n the competition between niches the more effective form of natural resource exploitation of greater economic significance supersedes that which is of lesser economic significance" (1985:162).

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A Tale of Two Rivers

Culture, Ecology, and Competition in an Alaskan Fishery

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ABSTRACT Most ethnographic accounts of commercial fishing have been concerned with ocean fisheries; river-based fisheries have received comparatively little attention. This paper concerns a Pacific salmon (*Oncorhynchus* spp.) set gillnet fishery in Southeast Alaska. It first examines the techniques and strategies used by setnet fishermen and how these have been shaped by the very different ecological conditions of two rivers. The paper then examines the different rules observed by the fishermen to determine access to and allocation of fishing sites, a potentially thorny problem in a river-based fishery where the best fishing sites are known by all fishermen and are finite in number. Of particular concern is how the fishermen have responded to increased competition for fishing sites and the mechanism adopted to avoid conflict. [Maritime, commercial fishing, ecological anthropology.]

While the literature on the anthropology of fishing has grown considerably in recent years (cf. Acheson 1981), the bulk of the writings concern marine fisheries. Alaska is a notable exception to this; anthropologists and other social scientists working for the Subsistence Division of the Alaska Department of Fish and Game (ADF&G) have conducted many studies of river-based fisheries (e.g. Braund 1980; Stanek 1981; Magdanz 1981; Stokes 1982; Thomas 1982; Caulfield 1983; Wolfe and Ellanna 1983; Magdanz and Ollana 1985). Most of these studies, however, have been of subsistence rather than commercial fishing, and because they have been conducted for a fish and game regulatory agency they have focused primarily on the distribution of fishermen, the mapping of resources, harvest levels, and other matters related to the management of resources. Moreover, the methodology on which these studies have been based has been primarily social surveys, and consequently the ethnographic content of the writings has been minimal.

The aims of this paper are threefold. The first is to provide an ethnographic account of the commercial Pacific salmon (*Oncorhynchus* spp.) set gillnet (setnet) fishery in the Yakutat region of Alaska. Second, is to examine how fishermen in the setnet fishery allocate rights to fishing sites, and how the different ecological conditions of two adjacent rivers have resulted in very different rules. And third, is how the fishermen have responded to increased competition caused by the arrival of a new group of *mobile* fishermen.

MAST 1990, 3(2): 68-87

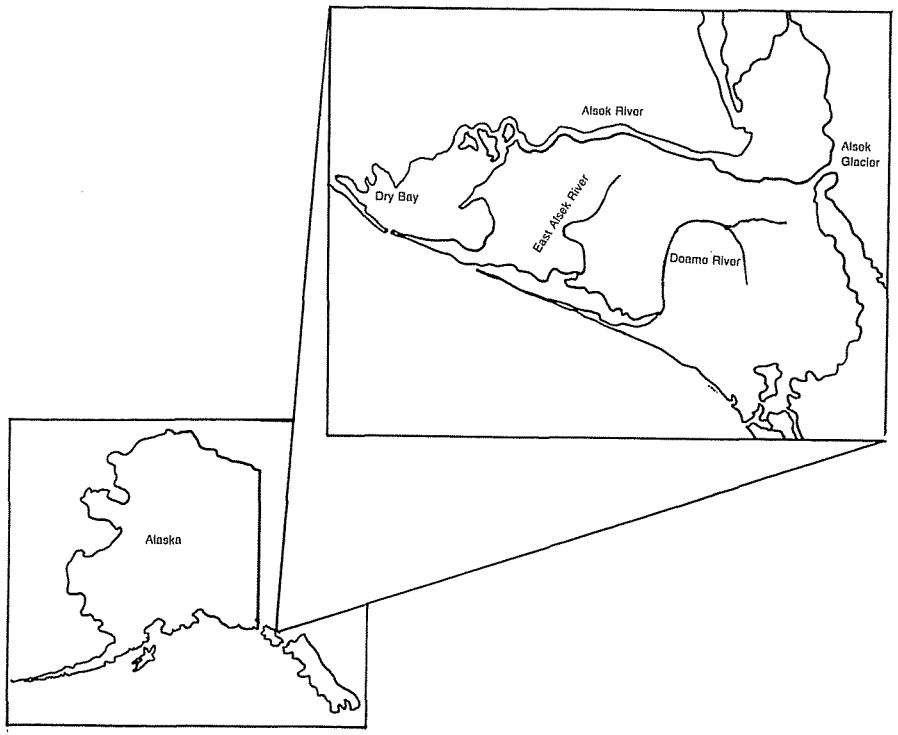
This salmon setnet fishery in Yakutat involves stretching gillnets from a river bank out into the river; salmon migrating upstream to spawn hit the nets and become entangled. The trapped fish are then *picked* from the nets by fishermen working from small boats while the nets are still in place. As in other fisheries, such as seining and trolling, there are proscribed rules of behavior to regulate the competition for access to the best fishing sites. Because setnetters are cognizant of the best places to fish, rules are needed to regulate the competition for access to the best sites. Setnetting in this region does differ from these other techniques for harvesting salmon in several ways though. First, setnetters spend comparatively little time in their boats away from land, and when they are on the water they are seldom more than 30 m from the shore. In contrast, trolling and seining are done on the open water; the fishermen work, eat, and sleep on their boats, and may be away from land for days at a time. Second, there is less danger in setnetting than in open sea fishing. This is not to say that setnetting is without hazard, especially in the glacial streams of Alaska which are frigid and swift; but it is clearly safer than fishing in the open seas of the Gulf of Alaska, where severe storms can develop quickly. Third, in riverine setnetting there is less uncertainty in knowing the location of the salmon since fishermen can read the contours of the river bank and the corresponding flow of the water to determine where the fish are mostly likely to gather. Trollers and seiners, in contrast, operate in a marine environment where it is more difficult to determine the location of salmon (Gatewood 1984; Langdon 1977, 1982; Orth 1986, 1987). Finally, setnetters typically work alone, whereas most trollers and seiners work in crews.

The fieldwork on which this study is based was conducted by the senior author (G. Gmelch) during the summers of 1982 and 1986.[1] The data were collected through a multi-method approach involving participant-observation, informal interviews, questionnaires, mapping, inventories of fish camps, and review of ADF&G harvest data. While the bulk of the data is qualitative, with much of the field time spent observing fishermen at work, a questionnaire survey was used to gather basic data on demography and patterns of resource use. The survey schedule was administered to 31 fish camps, 22 (92%) of the study area's stationary fishermen and 9 (35%) of its mobile fishermen.

The Setting: The Alsek and East Rivers

Dry Bay, the setting of this study, is located on the Gulf of Alaska about 80 km south of the village of Yakutat (see Map). The commercial fishery there takes place on two rivers – the Alsek and the East – which flow across a short coastal plane, known as the Yakutat forelands. Forming a backdrop to this coastal plane is one of the largest mountain ranges in North America, the St. Elias Mountains, with several peaks in excess of 5,000 m. Immense glaciers scour the mountain valleys, with melt water feeding the streams that flow out to the ocean.

The Alsek and East Rivers are radically different from one another. The Alsek River, which rises in the Yukon Territory, is almost 325 km long; while the East



Map of the Dry Bay area

River runs just 23 km from its artesian source to the ocean. The Alsek is extremely cold (3-5°C); most of its volume being glacial melt. The East River is shallow and because it is non-glacial, is comparatively warm (13-18°C). The water of the Alsek is turbid. From the air, its milky grey color gives it the appearance of watery cement. The East River, in contrast, is crystal clear. The current of the Alsek is swift, averaging six knots, while the East River's current is a gentle two knots.

Setnetters in both rivers focus their efforts primarily on red salmon (*O. nerka*), although pink (*O. gorbuscha*), chum (*O. keta*), coho (*O. kisutch*) and king salmon (*O. tshawytscha*) are important additions to the monetary value of the catch. Since 1976, the annual harvest of salmon in the Dry Bay region has ranged from a low of 62,172 salmon in 1976, to 217,363 salmon in 1985. Generally, the harvest from the East River has contributed the bulk of the catch (cf. Table 1 & 2). Despite its small size, the East river is nearly twice as productive as the Alsek River. The reason for its high salmon densities are ideal spawning conditions, so ideal that the local ADF&G biologist has referred to the river as "one giant hatchery" (Alex Brogle, pers. comm.).[2]

Table 1. *Historical salmon setnet harvest in the East River: 1976-1989*

Year	# of Fishermen	Days Fished	Kings (#)	Reds (#)	Coho (#)	Pink (#)	Chum (#)	Total Catch (#)
1976	8	54.5	119	29,816	1,129	3	6,712	37,779
1977	8	na	104	21,309	3,392	454	7,000	32,259
1978	18	57.0	80	31,003	4,727	185	5,428	41,423
1979	22	47.0	261	51,262	2,933	853	5,979	61,288
1980	52	41.0	76	48,530	2,401	193	18,782	69,982
1981	58	34.0	116	47,365	6,520	2,141	8,734	64,876
1982	40	42.0	81	97,785	2,026	428	4,668	104,988
1983	52	29.5	30	82,204	4,891	273	9,566	96,964
1984	48	27.5	22	39,023	10,875	851	22,419	73,190
1985	66	35.0	67	185,851	8,148	801	10,576	205,443
1986	78	28.0	109	76,355	2,769	332	14,285	93,850
1987	89	50.2	98	133,723	5,134	113	10,525	149,593
1988	81	39.0	40	61,483	20,148	2,628	24,453	108,752
1989	92	43.0	42	145,516	7,287	678	13,724	167,247
N:	14	13	14	14	14	14	14	14
Min:	8	27.5	22	21,309	1,129	3	4,668	32,259
Max:	92	57.0	261	185,851	20,148	2,628	24,453	205,443
Aver:	51	40.6	89	75,088	5,884	710	11,632	93,402
SD:	29	9.7	59	49,339	4,907	767	6,342	51,053

Note: From Anonymous (n.d.).

A Brief History of the Fishery

The fishermen in the Dry Bay area are all seasonal and comprise both Alaska Native (Tlingit) and non-native Anglo-Americans. There have not been any year-round residents in the Dry Bay area since 1908 when the last Tlingit village in the area was abandoned (Goldschmidt 1946:840).[3] At that time many of the Dry Bay natives moved to the large village of Yakutat, returning to Dry Bay only during the summer months to fish; others moved permanently from the region, settling in other towns in southeast Alaska. The transition from year-round village life in Dry Bay to seasonal stays in summer fish camps was hastened by the construction of a cannery in Dry Bay in 1910. The cannery provided fishermen with transportation from Yakutat to Dry Bay, making it possible for the natives to fish at Dry Bay, yet live in town.

At the same time, many Norwegians and Finns who had come to the area to work in the cannery, switched to fishing where they could earn more money and be independent as well. When the fishing season ended each September they moved to Alaskan coastal towns and cities, such as Sitka and Juneau, for the winter (Brogle 1981).

Table 2. *Historical salmon setnet harvest in the Alsek River: 1976-1989*

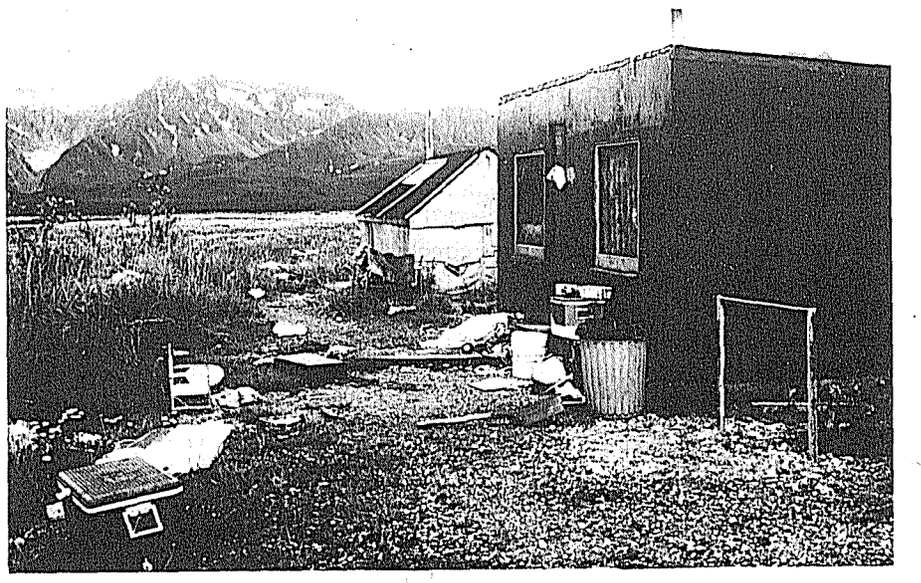
Year	# of Fishermen	Days Fished	Kings (#)	Reds (#)	Coho (#)	Pink (#)	Chum (#)	Total Catch (#)
1976	20	53.0	545	18,712	4,954	0	182	24,393
1977	22	57.0	1,385	39,409	11,351	58	169	52,372
1978	29	49.0	2,285	49,646	13,402	39	164	65,536
1979	38	45.0	2,561	40,223	6,044	25	120	48,973
1980	40	42.0	1,401	25,385	7,602	9	929	3,326
1981	21	40.0	761	24,680	10,614	25	472	36,552
1982	25	34.0	523	28,917	6,304	6	72	35,822
1983	18	40.0	77	19,131	5,661	7	299	25,175
1984	22	33.0	60	14,409	7,854	23	1,354	23,700
1985	21	33.0	212	5,603	5,674	8	423	11,920
1986	23	34.0	476	24,164	1,331	13	537	26,521
1987	27	38.0	345	11,299	2,537	0	1,922	16,103
1988	30	34.0	223	6,286	4,986	7	907	12,409
1989	28	38.0	240	13,513	5,972	2	1,031	20,758
N:	14	14	14	14	14	14	14	14
Min:	18	33.0	60	5,603	1,331	0	72	11,920
Max:	40	57.0	2,561	49,646	13,402	58	1,922	65,536
Aver:	26	40.7	792	22,956	6,735	16	613	31,111
SD:	7	7.7	810	13,117	3,274	17	548	15,769

Note: From Anonymous (n.d.).

The cannery closed in 1913 when the company's vessel, loaded with the entire season's catch of salmon (14,000 cases), sank in the mouth of the Alsek River, bankrupting the firm. But commercial fishing continued in the area after the 1913 accident, with the catch being shipped out for processing (History 1949).

Many of the native fishermen from Yakutat left the Dry Bay area abruptly after an earthquake measuring 8.2 on the Richter scale occurred in 1958. The earthquake had swept men off their feed, opened large fissures in the earth around them, changed the course of one area river and caused the largest vertical uplift (approximately 14 m) of land ever recorded. These fishermen did not immediately return after the earthquake as other rivers nearer to their homes in Yakutat were producing good catches. But by 1978, with the productivity on some of the other rivers declining and reports of tremendous profits at Dry Bay filtering into Yakutat, they began to return. Many of these older Yakutat fishermen had actually fished on the Alsek and East Rivers prior to the 1958 earthquake.

In 1982 the number of fishermen in the Dry Bay area varied from 30 to 75, depending upon the time of the season. Nearly all of the fishermen were men; the only exceptions were two women both of whom entered fishing through male



Fish camps of mobile native fishermen on the beach, near the East River

Fish camp of a non-native fisherman on the upper Alsek

relatives (i.e., one took over her husband's permit upon his death, and the other first fished with her father).

The fishermen comprise two recognizable and self-identified groups: 1) the stationary fishermen who have permanent fish camps (58 individuals in 24 fish camps), and 2) the mobile fishermen who spend only part of the season in Dry Bay, living in tents and temporary shelters on the beach (their numbers fluctuate widely; at the peak of the sockeye run in early August there are approximately 40 individuals living in 20 fish camps). The stationary fishermen are all non-native and most leave the region at the conclusion of the fishing season, although their permanent camps remain behind. The mobile fishermen are primarily Tlingit and all are residents of Yakutat. In addition, the mobile fishermen fish a number of different rivers along a 325 km stretch on the Gulf of Alaska during the summer fishing season.

Management of the Fishery

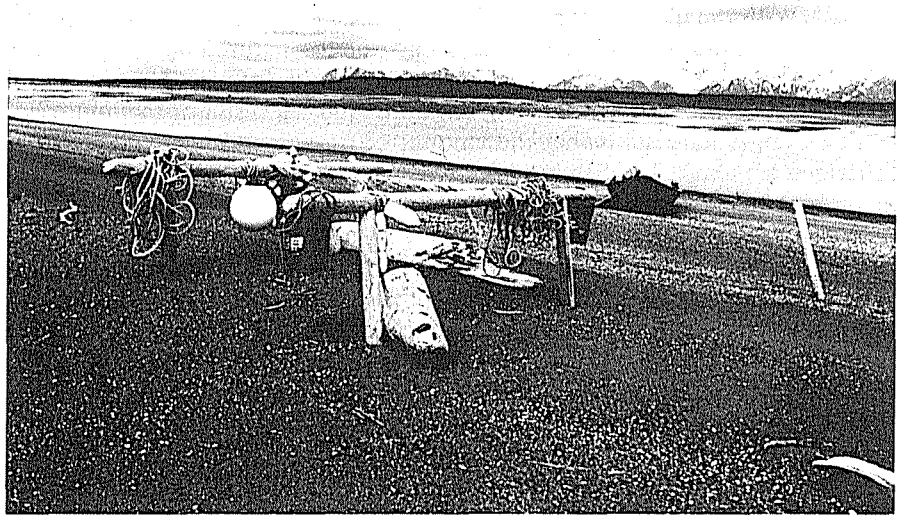
Setnetting is an extremely efficient method for catching salmon. So effective that well over half of all the fish in a river may be harvested during an *opening* (the weekly period during which fishing is allowed). On the narrow East River, where the nets often stretch two-thirds of the way across, and where there are 10 nets in the first five kilometers of the river, over 90 per cent of the salmon in the river are taken during an opening (Alex Brogle, pers. comm.).

The setnet fishery is managed by ADF&G by controlling the length of openings and amount of gear used, limiting access to permit holders, and regulating the areas where fishing is permitted. The ADF&G stipulates that nets be a minimum of 100 yards (91.4 m) apart. ADF&G permits fishing for periods of one to four days (openings). In the past, openings were customarily five days each week, but as the effectiveness of fishing gear and the number of fishermen increased, openings have become shorter. Dry Bay area fishermen now get one day openings at the start of the season. Once there has been an adequate escapement of salmon the opening is increased to two days and late in the season (August-September) to three days.

Mobile native fishermen checking their gillnets on the East River

State regulations also limit the amount of gillnet each fisherman may use. On the Alsek river, each fisherman is limited to not more than 91.4 m of gillnet prior to the third Monday in July; after which they are limited to 137 m. While on the East River, fishermen are limited to not more than 36.6 m of gillnet prior to the first Monday in September, and 73.2 m after (Anonymous 1984). In addition to restricting time, gear and effort, the area on each river where fishing is permitted is also regulated. On the Alsek the distance is 22.5 km while on the East River it is 4.8 (Anonymous 1984).

Since 1974, participation in this fishery has been controlled by the Alaska Commercial Fisheries Entry Commission. Entry permits may be owned only by individuals, though they are freely transferable with a current market value of $40,000. Prior to 1974 anyone who bought a commercial fishing license could fish in the Dry Bay area. But with the introduction of limited entry in 1974, commercial fishing was restricted to those who qualified for a permit. To qualify,



Rack for drying nets on the lower Alsek River

a fisherman had to have fished commercially in the area for a period of time prior to 1973. The purchase of an entry permit usually includes a fish camp and gear.[4]

The Techniques and Strategies of Setnetting

First let us examine the technology. The single most important piece of equipment is the gillnet. The gillnet is comprised of the webbing or mesh in which the salmon are caught, the *corkline* which is a rope that runs along the top of the net and to which are attached corks or floats, and a *leadline* which is a weighted rope that is attached along the bottom of the net to make it hang vertically in the water. Both the corkline and leadline are attached to anchors at the end of the net by means of a rope yoke. The yoke is important in that makes an integral whole of the various parts of the net, and it prevents the cork and leadlines from going their separate ways in the current. Finally a buoy to mark the location of the net in the water and to carry the required identification (i.e., the limited entry permit number) of the fisherman.

Since the different species of salmon harvested in the Dry Bay area vary in size (from 11 kilogram king salmon down to 1 kilogram pink salmon) the fishermen use different size net mesh: 22.2 cm for king salmon, 15.2 cm for coho salmon, and 13.3 cm for red salmon. As the season progresses, and new species arrive in the river, fishermen remove the old webbing and stitch on the new, proper size.

In recent years new net technology has had a significant impact on the fishery. Nylon nets were introduced to the area in the mid 1970s and swiftly replaced bulky cotton webbing. Nylon webbing is more difficult for salmon to see enabling fishermen on the East River, where the water is clear, to fish during the day. Formerly, they fished primarily at night when the salmon were unable to see well. With the older cotton webbing only the less *intelligent* chum salmon could be caught in quantity during daylight. Due to the turbidity of the Alsek River, which makes it difficult for salmon to see any type of net, fishermen have always been able to catch fish during daylight. Another result of the improved nets and larger harvests is that the amount of time (length of opening) that fishermen are allowed to fish has been reduced in order to protect the salmon from being over harvested.

Setnetting also requires a boat. Until the early 1970s all Dry Bay area fishermen used the same type of boat – a 5-6 m skiff made of cedar plywood with high sides and a flattened bottom. Today, however, fiberglass skiffs of the same basic design, a few Boston Whalers, and one aluminum boat are also used. Under certain conditions each type of boat, according to the fishermen, has advantages. For example, the wood skiff has more stability owing to its greater weight, and for this reason it is used by native fishermen living in Yakutat who travel 80 km to Dry Bay on the open ocean, and who also fish in the surf. The fiberglass Boston Whaler, in contrast, is fast, economical on fuel, maintenance free, unsinkable and can carry a greater load than the others. However, its low sides do not give fishermen a place to lean while reaching over the side to tend their nets.

It is also unsuited to the surf, and is the most expensive of all the boats to buy.

Fishermen power their boats with 40-70 horsepower outboard engines. Because of the swift current and dangerous conditions on the Alsek River, fishermen have two engines; while on the gentler East River, fishermen use a single engine.

Having described the equipment, let us turn now to the actual techniques of setnetting. The site on the river where a fisherman places his net(s) in the water is known as a *set*. In choosing a set the fisherman looks for a pool or eddy where salmon gather to rest for their journey up river. The fisherman also looks for evidence of fish, either being able to see them below the surface or fining on the surface. In silty glacial streams like the Alsek, much experience is required to recognize good sets. The fisherman places his net in the water either where the fish are schooled or between them and the direction they are travelling.

Because fishermen believe that salmon follow the bank as they travel, they set their nets toward the center of the stream perpendicular to the bank. Where the current is swift the nets are often swept back toward the bank at an oblique angle. Once the nets are placed in proper position, the fisherman waits in his boat or on the bank for fish to hit – indicated by the corks or floats bobbing up and down as the salmon, caught in the mesh, struggle to get free.

Many fishermen attempt to increase their catch by chasing salmon into their nets. This is done by driving their boats at high speed back and forth, particularly driving through the holes where fish may be sitting. Since fish tend to spook downstream, the net is usually placed at the bottom of a hole and fish are chased down stream into the net. The fisherman starts upstream near the next net on the river and runs his skiff downstream in increasingly faster and tighter circles until, with his last circle, he almost touches his own net. As the chasing takes place, numbers of salmon may be seen hitting the net at once, their fins and silver bodies flashing on the surface. Chasing salmon is only done were the water is clear enough to know the location of fish, and hence it is done primarily on the East River.

According to the fishermen, fishing is best on the flood tide since salmon prefer to move into the river and upstream with the tide. However, some are caught on the ebb as the fish circulate back downstream. Hence, in the lower reaches of the river, salmon may be caught going in both directions; while in the upper reaches, above the area influenced by tidal action, fish are only caught going upstream. Dry Bay fishermen also claim that in clear water of the East River, fishing is better at night when the salmon cannot see the nets as clearly. Time of day is not a factor on the Alsek River where the turbidity makes nets difficult to see at all times. According to the local ADF&G fishery biologist, salmon are most active and do most of their travelling in early morning and late in the day and tend to sit in holes during midday (Alex Brogle, pers. comm.). Nonetheless, the tides seem to be the most important factor.

After a number of salmon have been trapped in the net, the fisherman removes or *picks* them. To do this the fisherman leans over the bow of his boat, grasps the corkline and pulls himself and the boat along the length of the net, lifting

the net to check for fish as he goes. Each time he finds a fish, that portion of the net, plus the cork and leadline, is brought over the bow of the boat and the fish is removed. When there is a good *run* (i.e., a large number of salmon moving up the river) and salmon are hitting the net frequently, the fishermen work continuously back and forth across their nets. Dry Bay fishermen say it is important to keep the nets free of salmon because once several fish are caught those following behind will see them and go around. The same principle applies to keeping the nets clear of debris.

In this regard, the two rivers pose different sets of problems for the fishermen. The East River produces enormous quantities of underwater vegetation which is swept downstream by the current, clogging the fishermen's nets. Fishermen must regularly shake their nets, a small section at a time, to get rid of it. This is exhausting work and means that the East River fishermen must spend more time at their nets than fishermen on the Alsek or other area rivers. Moreover, on the ebb tide, which increases the current, there can be so much vegetation in the water that fishermen must remove their nets from the water, or risk having it sink to the bottom with the weight. (Actually, the nets are not physically removed, because to do so would immediately make the site available to another fisherman; rather the fishermen tie the webbing and the leadline to the corkline so that very little of the net is left below the surface of the water where it could collect vegetation).

On the Alsek River the major problem is not vegetation, but drifting logs and ice from a large calving glacier upstream. Small logs and chunks of ice foil the nets and keep the salmon away; large logs and chunk ice can destroy the nets. One man lost two nets to an iceberg the size of a car. When the river floods there is so much ice and timber that it becomes impossible to fish. On the positive side, ice may be taken from the river and used to chill the fishermen's catch until it is taken to the processors; it is also used in household ice chests.

Seals, preying on the salmon, trapped in the fishermen's nets are also a problem.[5] Fishermen estimate that five per cent of all the salmon netted are lost to seals. The salmon are mauled, most often being bitten in the area of the heart and gills and are either unsalable or fetch a lower price. Seals are said to be clever and to understand how gillnets work.[6]

Bears may also bother the nets. On the shallow East River bears wade in the stream and pull the salmon from the net. Some have actually hauled a net onto the bank to get at the fish. In both cases not only are the fish lost but the webbing is often damaged. To keep bears away, one fisherman keeps a fire going on the bank and spreads his dirty laundry on bushes to give the area a strong scent of humans. Another uses an automatic, noise-making cannon, like those used to keep birds away from cornfields. Still others shoot bears. Occasionally, wolves, both singly and in packs, are observed taking fish from nets that were left partially dry as the tide went out (Gordon Woods, pers. comm.).

The fishermen's nets also catch unwanted species of fish, notably starry flounder (*Platichthys stellatus*), Dolly Varden (*Salvelinus malma*), and Dogfish (*Squalus acanthias*). The number of these incidentals caught is particularly high

around the mouths of the rivers and declines as you travel upstream. On the East River, one fisherman was observed picking three flounder for every salmon from his net. Another fisherman reported that during one 24 hour period of heavy fishing he took over 150 flounder and 30 Dolly Varden from his net. Most Dry Bay fishermen throw incidentals back into the water (many do not survive); others simply toss them in their boats or on the bank so that they will not get caught in their nets again. A common euphemism for discarding fish in this way is to feed them to the eagles. Given the abundance of salmon, very few fisherman take the incidentals back to their camps to eat.

About twice each day, under normal fishing conditions, fishermen haul their catch to a small processing plant on the Alsek River. Most fishermen transport their catch themselves; those more distant from the plant have the fish buyer come pick up their fish in return for a slightly reduced price for the fish.

At the processing plant company workers unload the fisherman's boat at the river bank. Using a fish pew (a single tine pitch fork) they transfer the fish, counting the number, from the boat into a net lined sled. The sled is then pulled up the bank by a truck. The load of fish resting in the net is raised overhead by a small crane to which is attached a scale. The catch is weighted with the different grades or quality kept separate. The number of each category of fish and weight is then recorded with the fisherman's name and permit number, and a receipt given to the fisherman. Payment is made by check the following week.

The number of salmon caught during an opening may fluctuate widely from week to week depending upon the timing and strength of the *run*. For example, one East River fisherman, in 1982, caught only 17 fish one week, and at the same location he caught 1,200 fish a month later at the peak of the red salmon run; the difference in weekly earnings was over $7,000. Due to the size of the Alsek, there may be enormous differences in the catches of fishermen fishing at the same time, the differences being due to an uneven distribution of salmon in the river as well as migration paths that bypass some sets. For example, during one opening in July 1982, there were over 20 fishermen in the Dry Bay area, yet 15 per cent of the total catch was taken by a single fisherman at the mouth of the Alsek.

In the Dry Bay area there is none of the secrecy concerning catch success that is often characteristic of other fisheries (see Andersen 1972; Stuster 1978, 1980; Acheson 1981). Dry Bay area fishermen talk freely with other fishermen about how they are doing, disclosing without deception the number of salmon caught. Reports of individual catches are passed form person to person, usually beginning at the processor where the fish are weighed in. Using this information, fishermen are quick to generalize about how well one river is producing compared to the other, and more specifically how one section of a river is doing compared to others. Much of this is done out of sheer interest or curiosity, but the information may also be useful in deciding where to fish during the next opening.

Access to the Resource

Success in the Dry Bay setnet fishery is heavily dependent upon the fishermen securing good locations on the river to place their nets. The fishermen with the best sets usually catch the most fish. Other factors are also important to fishing success, particularly hard work, or in the words of the fishermen the willingness to "sit on your nets," picking them clean of both fish and debris regularly, day and night when the salmon are moving. But the quality of the set is most important.

On the upper reaches of the Alsek River, fishing sites are strongly identified with particular families.[7] In effect the river is divided into a number of distinct fishing territories, and by gentlemen's agreement integrity of these territories is observed by all local fishermen. Generally, when a fisherman purchases a limited entry permit, it is accompanied by the previous owners fish camp (usually a shack or cabin) and first rights to the best sets along the bank near his camp. Over the past decades no one has successfully usurped one of these sets, though one was temporarily taken while a fisherman was absent for a season.

The situation is quite different on the East River and on lower Alsek River where the rivers fan out into a delta. Here constant erosion and the repositioning of sand bars results in good sets frequently disappearing. While a number of permanent fish camps have been established along these waters, none of the camps are today near a prime producing set. The result is an understanding among fishermen that sets are claimed on a first come first serve basis. And once the fishermen claim their sites, they are able to keep them as long as they continue to regularly work them. The fishermen let one another know where their sets are by placing a buoy on the river bank with their name or fishing permit number on it. When large discrepancies in the sizes of the fishermen's catches occur over several openings, custom is strained. Fishermen with sparsely producing sets naturally want to move their nets to areas of greater productivity in order to increase their catch. Fishermen say that this is even more important today than in the past due to the shorter openings.

Short openings and the impermanence of good sites on the lower Alsek and East Rivers has resulted in some fishermen encroaching upon the territory of others, called *corking off*. The term commonly refers to placing one's nets immediately downstream of another fisherman's and thus intercepting salmon bound for his nets. Corking off is usually illegal since the encroaching fisherman usually places his net inside the required minimum distance between nets. Consequently, it is usually done at night; the fishery biologist explained:

> Everything is legal during the day. But on a dark, stormy night another fisherman throws in a net ten yards or so downstream from you. Since he doesn't want to lose his legal set, he is probably using an extra or "bingo" net. He may do it because you have a good site, but chances are he has a vendetta against you personally. I know one fisherman who corks off another fisherman every chance he gets.

In the past, the fishermen expected others to be far enough away so as to be out of sight, except around the prime spots at the river mouth. But all this changed with an influx of mobile fishermen from Yakutat beginning in 1978.

The stationary fishermen, particularly those who had arrived after 1958 with little knowledge of the Yakutat native fishing tradition, viewed the arrival of these fishermen as an "invasion." They had never experienced significant outside competition before; during their reign there had never been more than twenty fish camps and about forty people in Dry Bay. After 1978 that figure doubled, especially during the peak of the salmon migration.

How did the stationary fishermen respond to the competition? Initially some resorted to intimidation. Shots were fired over the heads of some of the mobile fishermen and several of their fish camps were vandalized. However, the majority of stationary fishermen rejected the use of force and in 1978 a method for dealing with the increased competition for fishing sites was introduced by the mobile fishermen. While sites on the East River and lower Alsek remained on a first come first serve basis, it now became possible for somebody to contest a site through a *challenge*, also known as a *race off*. That is, a race in which the first man to get his nets in the water wins the set. The challenger may either tell the fisherman whose set he wishes to claim that he wishes to "race" for it, or he may say nothing and simply place his net and buoy on the river bank near the other man's gear before the opening. Either way the challenger usually informs the stream guard or fishery biologist that he wishes to race and asks that he referee. The race is begun by the stream guard or biologist firing a gun or dropping his hand. The two fishermen race their skiffs toward the center of the stream, feeding their nets over the stern. The first man to get all of his net and anchor in the water is declared the winner. The loser must pick up his gear and move to another site, but rarely does the loser leave peaceably. More often the loser grumbles about the outcome and may even physically threaten the opposing fisherman and the enforcement officer who officiated the race off. Race offs have been known to be the cause of longstanding grudges between fishermen. On several occasions the fishery biologist has called in the Alaska State Police because of conflict and the threat of violence over race offs.

The races are not always fair in that the fisherman with the lightest skiff and the highest horsepower engine has an advantage. Differences in boats and engines, however, are considered part of the game and a fisherman cannot refuse to race simply because his boat is slower. In fact, on the Tsiu River, north of Yakutat, one challenger used a helicopter in competition against a boat, dropping his net and anchor from the air at the instant the starting gun was fired. Others countered by using five men who waded into the stream to hold their net above the water until the sound of the gun. There have also been several instances in which a fisherman tried to gain an advantage by using a shorter net: a man with a 15 fathom net is more likely to get it all in the water before one with a 20 fathom net. One fisherman won a race off using a five fathom net. Instead of leaving, the loser waited out the winner: when his opponent went to change his five fathom net to a length of net that would catch fish, the loser

dashed his net in and reclaimed the set (Gordon Woods, pers. comm.).

The Challenge: A Case Study

The following case reveals the kind of situation in which challenges usually occur and its course of action. In this instance no one was able to umpire, thereby leaving the outcome in doubt. The challenge occurred on 26 July 1982 at the mouth of the East River. Two individuals were involved, and while both were mobile fishermen from Yakutat, one (Fisherman A) is non-native and the other (Fisherman B) is native.

Fisherman A, the first Yakutat fisherman to arrive on the East River, had held the number one position inside the river mouth since the opening of the season. Fisherman B had the fourth set inside the river mouth. During the preceding weeks A had caught considerably more fish than B (but A is an exceptionally hard worker, spending more hours on his nets than most fishermen, so it is difficult to know what portion of his success was due to having a better set). Prior to the two day opening on 26 July, a sandbar developed in the hole where B had been setting his net, thereby eliminating his set. B had to find a new set and knowing that A had already made a lot of money decided to challenge.

10:00 Two hours before the opening. B has placed his net next to the marker on the bank opposite A's net. Everyone is aware of the challenge and curious to see how it will turn out.

11:00 Two stream guards and the fishery biologist arrive on their regular rounds. B tells the head stream guard that he wishes to challenge and wants him to referee. The stream guard declines, having recently been told by his superior not to get involved. A heated argument ensues in which B accuses the stream guard of discrimination and favoritism toward the "Washington" fisherman. [Fisherman A, in fact, is a non-native Yakutat resident.] Finally, the stream guard agrees to start the race but he will not declare a winner.

11:55 Five minutes before the opening. Both fishermen enter the river carrying their nets and anchor above the water. Because the tide is out the water is not deep enough to use boats.

12:01 As the stream guard lowers his hand both A and B drop their nets into the water; A who has the help of an assistant gets his net in first and walks to the bank while B is still feeding out his net into the current. Without a referee no one is declared the winner. The fishery biologist, realizing that neither party will accept defeat, then expresses the opinion that the race is a tie. Some of the bystanders know differently, but no one says so. The head stream guard tells A and B that they have 15 minutes to sort things out or he will have to confiscate their nets and write them tickets. Neither A nor B budges; they sit motionless on opposite banks, each waiting for the other to make the first move. Both A and B have an extra net nearby in case their nets are confiscated. Interest among the bystanders heightens as they wonder how the stalemate will be resolved.

12:45 At the stream guard's request, A crosses the river and talks to B. No agreement is reached.

13:00 With no sign of the stalemate being broken, and wishing to avoid further conflict, the biologist moves the boundary marker, stating that it was out of place. He moves the marker far enough down river to allow both A and B to squeeze in, to have the required distance between their nets.

The end result of this challenge was that both fishermen were able to stay at the river mouth; however, the challenger succeeded in capturing the number one and better position. For the challenge to work as a mechanism for managing competition it is essential that both sides accept the verdict of the referee. In 1982 what little order there was broke down when the fishery biologist and stream guard (Fish and Wildlife Protection Officer) were ordered by their superiors to stay out of the potentially "messy business" of refereeing challenges. For awhile competing fishermen asked an independent third party to referee their races, but over the years since 1982 challenges have gradually died out, such that in 1989 the fishery biologist was unaware of any having occurred. A major cause for the decline in challenges, believes the fishery biologist, has been three consecutive "good" years of fishing in which all the fishermen have done well. This has been coupled with efforts by the stream guard and biologist to avoid, whenever possible, ticketing fishermen who are in violation of the regulation concerning the minimum distance between nets. This has the effect of minimizing the possibility of conflict between individual fishermen. Instead of confiscating gear and giving out tickets, the authorities have tried to "squeeze" everyone in by shifting the adjoining fishermen's nets wherever possible to create the necessary distances between everyone's nets (Gordon Woods, pers. comm.).

When fishermen were questioned about the ethics of attempting to take a set away from someone who was there before them, most mobile fishermen asserted that challenges are legitimate and that they have a long tradition on other area rivers. They added one qualification, that elders who have fished the same sets for many years should be immune to challenges. In fact, there was a case involving a young native who raced and won a set on the Situk River from an elder. The loser took the case to court; the Yakutat judge ruled in his favor on the grounds that having fished there over a period of years and having maintained the set by clearing away logs, the elder had proprietary rights. In contrast, most stationary fishermen asserted that the first fisherman to claim a site should have exclusive rights as long as he regularly fishes there.

Finally, it should be noted that challenges in setnetting are unique to the Yakutat region. In the other major setnet fisheries in Alaska (Cook Inlet, Kodiak, False Pass and Bristol Bay), setnet sites are registered with the State of Alaska and ownership generally unquestioned. Due to the constantly changing formations of the East River and the lower Alsek, and therefore the absence of permanent sets, such a system would be unworkable in the Dry Bay area.

Conclusions

Given the importance of having a good set, coupled with the facts that in a river-

based fishery the best sites for fishing are fixed, known, and finite in number, how do fishermen regulate competition for fishing sites? And to what degree do conditions on the Alsek and the East Rivers dictate different strategies?

The "understandings" among the fishermen that have emerged in the Dry Bay area have indeed been shaped by geography and history. On the upper Alsek, where the river flows through rock and therefore where the contours of the river and the location of the sets are fairly constant from year to year, the fishing sites are tied to ownership of fish camps. While on the East River and the lower reaches of the Alsek, with their ever changing profile, fishing sites are much less fixed and access rights are of short duration. Because of this temporal nature, a mechanism for allocating access (the *challenge*) was introduced.

Given that the challenge is a Yakutat native custom, why did the stationary fishermen accept it? An important factor was its support by the ADF&G fishery biologist, a widely respected and charismatic figure with many years experience. The biologist made it workable by agreeing to umpire, doing so primarily out of concern for maintaining order between competing fishermen when there was intense pressure for a limited number of good sets.

Another important factor in the acceptance of the challenge was that it did not apply to the traditional sets on the upper Alsek or to any sets that had been worked continuously for more than one season by the same fisherman. Hence most challenges were to take place between the mobile fishermen, with the stationary fishermen being less frequently involved.

We believe the difference in attitude between mobile (generally native) and stationary (generally non-native) fishermen reflects cultural differences in how they view the environment: the non-native Western culture valuing private ownership of land versus a communalistic native culture with a tradition of clan ownership, coupled with a belief that the land and waters are there for all to use (cf. Berger 1985; Nelson 1985).

Finally, why is there such openness about catches in the Dry Bay area when in so many other places fishermen resort to all sorts of deceptive strategies to keep the same information from their competitors? Part of the answer lies simply in the impossibility of concealing information in a very small population where each fisherman's catch is weighed openly in full view of anyone who cares to observe. But also, in a fishery in which each fisherman is fairly fixed in one place and is not as mobile as in ocean fishing, at least for the duration of each opening, there is no serious disadvantage in others knowing how well one is doing.

Acknowledgements

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Notes

1. The field research was conducted by George Gmelch; a full description of the fieldwork and the problems of doing research among competing groups of fishermen can be found in Gmelch (1990). Geoffrey Orth, a maritime anthropologist, assisted with the analysis and writing.

2. There are at least three contributing factors, according to the local fishery biologist: 1) the artesian flow of water prevents the river from freezing, and thereby results in a high survival rate for the salmon eggs; 2) a profusion of underwater vegetation shelters the fry from predators and puts a great deal of oxygen into the water; and 3) the combination of minerals from the mixing of the Doame and East River waters creates a fertile environment. The fry mature so rapidly in the East River that they move out to sea their first fall, a full year before fry in most other waters (Alex Brogle, pers. comm.).

3. According to De Laguna (1972), the native population along this entire stretch of the Gulf of Alaska (from Controller Bay to Cape Spencer) was never very large. A Russian explorer in the 1880s counted only 820 people along the entire 240 km of coastline, little more than the present day population of Yakutat.

4. Because all of the Dry Bay area is either United States Forest Service or National Park land, the construction of cabins or tent frames is restricted to those who have fishing permits and those who guide hunters. Hence, fish camps (i.e., cabin or tent and gear) has traditionally changed hands along with the sale of a permit.

5. Seals are more of a problem on the Alsek River than on the East River. This is partially due to there being more food (flounder and shrimp) for seals in glacial streams than in warm water. But also, according to fishermen, seals have had a more difficult time surviving the assaults of fishermen in clear water streams. There, unlike in silty streams, they can be seen and shot or chased with boats until they drown. Further, he suggests that the inability to control the seal population has led native fishermen in the past to under fish the Alsek and other glacial rivers. Indeed seals persistently come around a net, most Dry Bay fishermen shoot at or near them to scare them off.

6. This was aptly illustrated by the local fishery biologist. In 1981 a severe storm resulted in fishermen abandoning some nets in the surf at the mouth of the East River. When the biologist went to remove them, after the storm abated, he found behind each of the three nets still in place, a seal working them – driving salmon into the net and then retrieving them.

7. In a study of Eskimo fishermen on the Nome River, Magdanz and Ollana similarly note that "virtually every good set net site on the river is identified with individual fishing families" (1985:15).

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Dispute Settlement in the Newfoundland Inshore Fishery

A Study of Fishery Officers' Responses to Gear Conflicts in Inshore Fishing Communities

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ABSTRACT Dispute settlement is integral to fishery officers' regulation of the Newfoundland inshore fishery. Fishery officers act as mediators in disputes relating to a variety of fisheries utilizing different gear types. Drawing upon interview data with 51 fishery officers, it will be shown that they make reference to usufruct, or informal rules used by local fishers, in the settlement of many disputes. Moreover, even when they enforce regulations in dispute settlement, fishery officers prefer a flexible rather than strict implementation of rules. However, disputes cannot be reduced to personality differences between inshore fishers. Many disputes are rooted in the ecological conditions of inshore fishing communities. But, the disputes between small boat and longliner fishers are a consequence of state policies which have generated inequality within the inshore fishery. The paper concludes by arguing that given recent changes in the inshore fishery and the fishery officer occupation, the future of dispute settlement is away from mediation and towards strict enforcement.

Introduction

Dispute settlement is intrinsic to the day-to-day operation of the Newfoundland inshore fishery. Data collected in interviews with fishery officers located in the Canadian Department of Fisheries and Oceans' (hereafter – DFO) Newfoundland Region, show that fishery officers settle a variety of conflicts among inshore fishers. These include: disputes over berth draws and rights to access, conflicts among owners of fixed gear and conflicts between fixed and mobile gear owners. In dealing with gear conflicts, fishery officers act as mediators balancing usufruct or use-relations derived by local communities and formal DFO rules. Mediation is the norm, enforcement is the exception.

It will be argued here that disputes have their roots in the ecological and social contexts of the Newfoundland inshore fishery. In particular, it will be argued that conflicts among fixed gear owners, and especially the conflicts between fixed and mobile gear users, are due to state policies which encouraged rapid expansion and social differentiation within the inshore fishery. Moreover, the current crisis in the Atlantic Canadian fishery will only serve to entrench and intensify conflicts.

Finally, it will be shown that the DFO response to this crisis is to intensify enforcement. This will result in a shift from the compliance-based policing, currently prevalent in Newfoundland's inshore communities, to deterrence-based

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policing emanating from organizational directives. Recent DFO policy is based upon bureaucratizing the recruitment, training and location of fishery officers. This is accompanied by measures to intensify surveillance of inshore waters. Given this, fishery officers future handling of disputes is oriented towards the courts rather than towards mediation on the fishing grounds.

"Policing" the Inshore Fishery

According to Wilson (1968) and Ericson (1982), police officers tend to resolve disputes at their point of origin. That is, they practice "order maintenance" rather than strict enforcement. Moreover, rural police officers make reference to both community and legal norms in their day-to-day work (Banton 1964; Cain 1973; Decker 1979). Reiss (1984) and Kennedy (1990) refer to this practice (among police officers in general) as compliance-based policing. Local and formal rules are used as a basis for conflict management, rather than enforcement. These observations are relevant to our consideration of fishery officers.

Studies of inshore fishing communities have demonstrated that informal, as well as formal rules, are used in regulating access to the fishery (Martin 1979; Davis 1984; McCay and Acheson 1987; Matthews and Phyne 1988). "Policing" is not restricted to DFO rules.

Davis's (1984) study of Port Lameron Harbour, Nova Scotia, demonstrates the existence of usufruct or use-relations in regulating access to the community's coastal waters.[1] According to Davis: "Claims of ownership and control of property is centred in the community, and individual use rights are derived from membership in the community" (1984:146). In short, the community defines and "polices" access to the resource. Davis (1984) goes on to argue that when fishers from a nearby community persisted in setting gill nets in Port Lameron Harbour, these were removed because their presence violated both usufruct relations and local fishers rights to a livelihood. Below it will be shown that in dealing with some fixed gear disputes (especially berth draw disputes), Newfoundland fishery officers often make reference to the usufruct relations of fishing communities.

Sometimes local norms are codified. Martin's (1979) study of space allocation in Fermeuse, Newfoundland shows how local small boat fishers, using handlines, had a rule passed preventing longline fishers from setting gill nets in community waters. This rule was codified by a forerunner of the DFO and enforced by the local fishery officer. However, Martin (1979) argues that the fishery officer only involved himself with disputes between handline and gill net fishers if a complaint was lodged. The data presented below shows that fishery officers take a similar passive stance in regulating gear conflicts, even when they have the prerogative to enforce DFO rules.

The contemporary Newfoundland inshore fishery consists of both informal and formal rules. Inshore fishers still refer to local customs within the confines of formal DFO rules. For example, while inshore fishers agree with federal licensing policy, they also use local rules such as cod trap berth draws and the allocation of gear types within specific areas (Matthews and Phyne 1988). In interviews

with 144 inshore fishers located in six communities, Matthews and Phyne (1988) discovered that in five of these communities traditional rules remain in controlling access to local fishing grounds. However, this combination of usufruct and formal rules is a transitional phenomenon in the "bureaucratization" of the inshore fishery (cf. Thiessen and Davis 1988). The current trend is toward the greater use of formal rules (cf. Haché 1990). While this trend is the direction for the future, fishery officers will be shown to refer to both usufruct and formal rules in regulating conflicts in the inshore fishery. The current emphasis is upon compliance in order to avoid future conflict (cf. Reiss 1984; Kennedy 1990).

Methods

The data on dispute settlement were collected during a larger study concerning the relationship between managerial control and workers' discretion in the fishery officer occupation (Phyne 1988). On the basis of structured interviews, data were collected on fishery officers' discretionary role in mediating a variety of disputes.

The data on dispute settlement were collected on the basis of questions which examined fishery officers' public relations role. These questions (and the interview schedule in general) are based upon the job description outlined in *The Fishery Officer Career Log* (cf. Fishery 1984).[2] Since all fishery officers were familiar with this document, the researcher decided to examine the relation between the job description and actual work and discretionary practices of fishery officers. The public relations role was recognized by 86.3 per cent (n=44) of the respondents. Questions included: "When you are working in the area of public relations, what groups of people are you most likely to deal with?"; "Do you think public relations is important?" In answering both of these questions, fishery officers emphasized public relations as a device to be used in dispute settlement.

Respondents were selected from a population of 85 fishery officers situated in the island portion of the DFO's Newfoundland Region.[3] From this population, interviews were conducted with 23 senior and 28 junior officials.[4] Interviews were held from May 1 to August 3, 1985. Since data were collected at the height of the inshore fishing season, fishery officers were able to draw upon immediate experiences in their discussion of dispute settlement.

Due to budgetary and time constraints, data collection had to be restricted to structured interviews. Unfortunately, it was not possible to draw upon ethnographic information from local fishers directly involved in gear disputes. Despite this, fishery officers' views are not divorced from local settings. Among the 51 fishery officers interviewed, 86.3 per cent (n=44) were born and raised in rural Newfoundland. In addition, 27.4 per cent (n=14) are the sons of inshore fishers and 25.4 per cent (n=13) are former inshore fishers. Hence, many fishery officers have had some direct experience with the usufruct relations they describe as being a basis for resolving gear disputes.

Finally, although no ethnographic data were collected on inshore fishers' views of gear disputes, data presented by Matthews and Phyne (1988), Davis and Kasdan (1984) and Kearney (1989) will be used to demonstrate inshore fishers' views of usufruct relations. Such views are integral in determining how fishers interpret what constitutes conflict, and the relations fishers have with fishery officers in resolving conflicts.

Dispute Settlement in the Newfoundland Inshore Fishery

Fishery officers are involved in a variety of disputes in the Newfoundland inshore fishery. Data will be presented concerning three types of disputes: berth draw and rights of access disputes, conflicts among owners of fixed gear and conflicts between owners of fixed and mobile gear. As we shall see, these conflicts cannot be reduced to technological disputes. On the contrary, conflicts often occur during the intersection of different fisheries within the narrow ecological niches of coastal communities. Moreover, fishery officers settle disputes by reference to informal and formal rules. Throughout, it will be shown that fishery officers, like police officers, use compliance-based policing in settling disputes (Reiss 1984; Kennedy 1990).

Berth Draw Disputes and Rights of Access

Usufruct relations are present in many inshore fishing communities. During the early spring of each year, inshore fishing communities which have cod and/or salmon trap fisheries usually participate in a draw for fishing berths. The draw is held to ensure regulated access to the limited number of fishing berths, and is usually overseen by the local fishers' committee. Even though this is a common practice, it is by no means universal. Many communities have berths which are held by specific families and passed along to the next generation. However, in both instances, usufruct rights are used to regulate community fishing grounds for the use of fishers within the community.

Despite the existence of informal rules, conflicts over access rights may occur. Due to this, inshore fishing communities with berth draws usually invite the local fishery officer in order to legitimate the process. According to one junior fishery officer:

> We sit back and let them do what they want at berth draws. When they are completed we sign berth draw licenses. We are asked not to step in, but to let them iron out their own problems (Interview no. 47).

One senior fishery officer described how he mediated a berth draw dispute between two neighbouring communities:

> This year [...] and [...] have a joint cod trap berth draw committee. They decided they wanted to split and divide the area of control. They could not agree upon a boundary. We had several meetings with them and we got them to compromise in the end (Interview no. 26).

However, sometimes disputes cannot be resolved within a fishers' committee. One senior fishery officer referred to how he used his position to have local customs codified in one community (cf. Martin 1979).

> The regulations in the cod trap draw say no new entrants. On the other hand, one can become involved if a berth becomes available. In the past, we allowed the committee to do it, but a lot of injustice was done (i.e., friends and relatives were given berths). I proposed that a person should only be allowed to enter the berth draw if he worked with a cod trap operation for the past five years. That was accepted by the department (Interview no. 1).

This fishery officer was involved in the codification of local rules because he made reference to usufruct rights in his policy recommendation.

In dealing with disputes in berth draw committees, the fishery officer's presence is mobilized by inshore fishers. And, he makes reference to local customs in settling disputes. This also applies in cases pertaining to rights of access where berth draws are not used. One fishery officer described a case in point:

> Another beauty we get entangled with in a lot of cases is what they call traditional cod trap berths. Forty years ago someone would use a certain place to use a cod trap and it has been used down the years, and someone else will decide to use it for something else. But if someone else puts a net there he has got to take it out of there (Interview no. 30).

Another officer related a similar situation in this manner:

> In the last week a fisherman took up a cod trap for repair. When he went to replace it, someone put their trap in his place. This was not a berth draw place ... But we felt that the individual should be given a day or two to repair his trap. We talked to both parties and the guy who set his trap there removed it to let the original guy set his trap (Interview no. 12).

Hence, fishery officers act as mediators in areas where formal DFO rules are not used. They are brought into conflicts by inshore fishers to act as "impartial" enforcers of local rules. In addition, some fishery officers have participated in the codification of local rules.

Fixed Gear Disputes

While cod trap disputes revolve around the placement of gear, other fixed gear disputes are based upon the use of different gear types within a restricted harvesting space. Informal rules often govern the regulation of different gear types. According to one fishery officer:

> This year we dealt with several committees with regard to restricting the use of gill nets on fishing grounds. They wanted them off the grounds around the middle of August. The general feeling goes that way in order to help handlining and jigging (Interview no. 43).

Despite this, formal regulations are used to regulate the *distance* between fixed gear. Fishery officers rarely enforce these regulations. Moreover, they only respond to gear conflicts at the request of inshore fishers. As one officer described it:

> Settling fishing disputes is up to yourself. You got two cod traps that are supposed to be 80 fathoms apart. You may not have enough room to move 80 fathoms apart and we try to tell them: "Now boys you can't move 80 fathoms apart but move 70 fathoms apart" (Interview no. 31).

Another officer explained the situation in the following way:

> The 50 fathom thing for fixed gear (i.e., other then cod traps) – the rationale for regulation is there for us to settle disputes. If you set your own nets closer we don't care, but when other people complain we intercede to try to settle it (Interview no. 48).

In fact, although the settlement of gear disputes became part of fishery officers' duties in 1960 (Kelland 1961), they try to settle conflicts on the fishing grounds and not in the courts. They argue that all inshore fishers have a right to make a living. This also pertains to the conflicts between the users of fixed and mobile gear.

The Conflicts Between Fixed and Mobile Gear

While fixed gear conflicts may occur among inshore fishers operating out of small boats (less than 35') and longliners (motorized vessels 35' to 65'), the conflict between fixed and mobile gear operators is usually between the small boat fishery and those in the longliner fishery. The conflict between fixed and mobile gear tends to occur when longliners, equipped with purse seines, harvest capelin stocks in the vicinity of the fixed gear of small boats. As purse seiners chase spawning capelin close to the shoreline, they may interfere with both the catch and gear of fixed gear fishers (cf. Sinclair 1985). According to a junior fishery officer: "Big seiners can go through a mackerel or herring net and tear it up trying to get capelin" (Interview no. 39). This occurs although regulations prohibit mobile gear from being cast any closer than 400 metres to fixed year. Fishery officers commented that small boat fishers often complain about the use of mobile gear. As one officer noted:

> The fixed gear fishermen are complaining that purse seine fishermen are destroying the gear and taking their fish. We [settle disputes] mostly by being seen ... Last year we went out and counted 48 seiners at the front of the harbour, and if we weren't there they would have been around the fixed gear (Interview no. 21).

Another fishery officer described the situation in the following manner:

> The big problem between mobile and fixed gear is in the capelin fishery. A gear conflict is your longliners coming in and striking up your cod traps, and causing damages not only

> to your cod traps but also to salmon gear. A lot of fishermen say that the seiners are catching too many fish and taking all the cod (Interview no. 15).

However, fishery officers rarely enforce the 400 metre distance between fixed and mobile gear. One fishery officer argued that violations of the 400 metre distance only resulted in seven charges in his district in 1983 and no charges in 1984 (Interview no. 23). This is in an area where the capelin quota is concentrated. As the following comments indicate, fishery officers argue that restricted harvesting spaces and the *right* for mobile gear users to make a living precludes the use of strict enforcement:

> It is impossible because there is so much fixed gear in the water – it leaves no room for the mobile gear (Interview no. 43).

> We had the capelin fleet going in on top of the fixed gear in the [...] area and tearing it up. We instigated patrols into the area. When boats set seines too close to the fixed gear, we had to get them to move. The regulation is supposed to be 400 metres, but if we followed that to the T, there would be no mobile gear in [...] because there is fixed gear all over the bay (Interview no. 45).

> We have problems of mobile seiners for capelin shooting gear across fixed gear – they have to make a living too. So there comes your discretion. If they are not damaging the gear, I try to tell them about it. But if they are damaging it out they go (Interview no. 31).

In sum, the settlement of gear disputes results in the reproduction of the status quo. But, as the next section reveals, this status quo is full of contradictory relations between different groups of fishers.

The Social and Ecological Context of Gear Disputes

The narrow ecological niches harvested by coastal community fishers play a vital role in structuring the nature of access to fish stocks (Martin 1979; Davis 1984). And, while access to such stocks are usually regulated through usufruct relations, it has been shown that fishery officers play an integral role in using such local norms in dispute settlement.

However, all conflicts over access to coastal waters cannot be reduced to a community's ecological niche. On the contrary, many fixed gear disputes and conflicts between fixed and mobile gear users are directly attributable to state policies which encouraged both expansion and social differentiation within the Newfoundland inshore fishery. This placed excessive strains on the resources available to coastal communities, and can be illustrated through a brief examination of the longliner fishery, a fishery which utilizes both fixed and mobile gear.

According to McCay (1979), since Newfoundland joined Canada the provincial government encouraged the development and expansion of the longliner fleet. Fishers were encouraged to abandon small boats and cod traps in exchange

for a larger, more mobile vessel equipped with longlines and gill nets. Moreover, with the rapid decline in fish stocks in the late 1960s many fishers turned to these longliners as a means for moving further offshore to catch fish. Fishers were able to finance the cost of their longliner with the aid of government loans and subsidies, in addition to their 10 per cent down payment.

In 1973 longliners cost $40,000 to $60,000 and cod traps cost $3,000 to $5,000 (McCay 1979). Hence, longliner fishers had a much bigger capital overhead to cover. Since some longliner fishers use a combination of fixed and mobile gear, they are in a better position than small boat cod trap fishers to harvest fish stocks. Fishery officers argue that capelin seiners can make a lucrative income from the capelin fishery. According to one senior fishery officer:

> In terms of effort, capelin is the most lucrative fishery in this area. They can get $1,000 a tonne for capelin and they can get 20 tonnes a day. It is only a three week fishery, but in those three weeks he can make more than with all of his other licenses combined (Interview no. 1).

A junior fishery officer remarked that during economic hardship capelin seiners will ignore the 400 metre rule:

> This year a lot of purse seiners are not doing very well and there is instances where they operate closer than 400 metres from the traps and if we don't have any complaints from the trap fishermen, we turn to one side (Interview no. 27).

Hence, the conflict between fixed and mobile gear operators has a structural basis in the emergence of a capital-intensive longliner fishery from the labour-intensive small boat fishery (cf. Fairley 1985).

By the late 1970s and early 1980s, low interest rates for fishery loans (as low as 3.5 per cent) facilitated the rapid expansion of the longliner and inshore dragger fleets.[5] Table 1 shows the expansion of this fleet in the period 1978-1981. The nearshore fleet (including longliners) was taking advantage of the fact that by 1978-1979 three-quarters of the total allowable catch was allocated to the inshore fishery which consisted of all vessels under 65' (Newfoundland 1980). Table 1 shows that while the inshore or, small boat fishery (under 35') was stable between 1978-1981, the nearshore fishery rapidly expanded. This was especially evident in vessels from 35' to 45', which increased by 48.13 per cent.

By 1981 nearshore vessels such as longliners and inshore draggers, which constituted less than 18 per cent of all vessels under 65', harvested over 53 per cent of the total catch for such vessels (calculated from Navigating 1983). Hence, during the crisis of the early 1980s the small boat fishery was being squeezed by the nearshore fleet. Given these circumstances, one can see the structural basis of gear conflicts.

Atlantic Canadian fisheries are in the midst of another crisis, and once again conflicts are emerging in the inshore fisheries. One of the biggest conflicts in Atlantic Canada is between the inshore dragger fleet and small boat fishers in

Table 1. *Changes in the Inshore and Nearshore Ground Fish Fleet of Newfoundland, 1978-1981*

Type of Fishery	Size of Vessel	Number of Vessels 1978	1981	Percentage Change
Inshore	Under 35′	6342	6318	−0.37
Nearshore	35′ - 45′	590	874	48.13
	45′ - 65′	457	507	10.94

Note: This table is derived from figures in Tables 10.2 and 10.3 in Navigating (1983:208-09).

southwest Nova Scotia. The Haché Commission reports that small boat fishers viewed inshore draggers to be a "destructive fleet". During the late 1980s, the size and capacity of the inshore dragger fleet escalated while groundfish stocks and catches declined (Haché 1990).[6]

In sum, while many conflicts are rooted in the ecological conditions of inshore communities, state policies have altered the social organization of the inshore fishery. The differentiation of longliner and other nearshore producers from the small boat fishery has contributed to a competition for fish stocks. This often results in gear conflicts which have to be mediated by fishery officers. While small boat fishers are committed to fixed gear, it is clear that nearshore producers are committed to a variety of gear types, including mobile gear. And, given the current costs of many vessels within the nearshore fishery [some inshore draggers in southwest Nova Scotia cost $750,000 (Haché 1990)], producers are going to continue to use mobile gear to finance the "escalating" costs of their fishing.

The Nature of Conflict Regulation

Up to this point, data have been presented on the mediating role of fishery officers in resolving gear disputes, as well as on the social and ecological context of such disputes. Here, it will be shown that fishery officers' dispute settling role is analogous to the compliance-based role of police officers. However, recent changes in the fishery officer occupation are viewed as having negative implications for this role.

The Relations Between Inshore Fishers and Fishery Officers

The attitudes and role of fishery officers in dispute settlement reflect research findings in the literature on rural policing. Like the police officers studied by Banton (1964), Cain (1973) and Decker (1979), fishery officers make use of local norms in handling disputes. The object is to prevent conflicts from escalating into "troubles" which require legal action. By adhering to both custom and legal norms as a basis for conflict management, rather than resorting to legal action,

fishery officers are practising compliance-based regulation.

According to Reiss (1984) and Kennedy (1990), police officers in general have access to compliance-based and deterrence-based policing. For Kennedy (1990:88):

> Compliance systems seek to create law-abidingness and rely on preventive or remedial actions. This process does not necessitate the detection, processing or penalizing of violators but rather emphasizes the need to provide incentives to individuals to comply with the law or to threaten to invoke penalties for noncompliance.

This process is exemplified in fishery officers' reference to usufruct relations in dispute settlement. Here "the law" is not merely formal regulations. In contrast, deterrence-based policing is more legalistic and is based upon penalizing those in violation. The emphasis is upon arrests. Moreover, such actions take conflict out of the community and place it in the courts (Kennedy 1990).

But how do inshore fishers feel about usufruct relations as a basis for dispute settlement? More importantly, how do they relate to fishery officers? Although no ethnographic data on inshore fishers were collected for this study, research by Matthews and Phyne (1988) on Newfoundland and Davis and Kasdan (1984) and Kearney (1989) on southwest Nova Scotia, demonstrate fishers' attitudes on the importance of usufruct relations.

As it was shown earlier, Matthews and Phyne (1988) provide data on the prevalence of usufruct relations in Newfoundland. On the basis of these data, they conclude that in the midst of limited entry practices imposed by the DFO

> ... [t]raditional cooperative arrangements remain because they do regulate the resource itself. That is, they are tools of resource management ... To violate such regulations deliberately and knowingly would lead to social censure by one's peers. Most fishermen also recognize that a violation of such principles might indeed lead to a battle in which they too can only lose (1988:168).

While Matthews and Phyne (1988) do not indicate cases where fishers seek out fishery officers to resolve conflicts, they do show that usufruct relations are part of local customs. This, combined with the data on fishery officers, demonstrates that both users and regulators do not restrict themselves to legalistic criteria in settling disputes over access to the fishing resource.

But, southwest Nova Scotia is a different case. Davis and Kasdan (1984) and Kearney (1988) show that conflict between the DFO and lobster fishers occurred in 1983 because the former violated local customs in its enforcement practices. While lobster pot limitations were implemented in 1968, these were never strictly enforced. But when fishery officers persisted in hauling untagged lobster pots in the spring of 1983, local lobster fishers burned and sank two DFO patrol vessels. Fishery officers had violated local customs which dictated that "... no individual is to handle another's gear once it is set" (Davis and Kasdan 1984:119).

Hence, the respect for local customs by fishery officers in Newfoundland, even

in cases where they have recourse to legal measures, facilitates their ability to resolve conflict. It facilitates compliance-based policing. However, fishery officers in southwest Nova Scotia in 1983 were practising deterrence-based policing by directly penalizing violators in the lobster fishery. While this is not a gear conflict between different groups of fishers, it shows how fishery officers can be the *object of conflict*, rather than mediators, once local customs are ignored.[7]

The Future of Dispute Settlement and Enforcement

The data, presented above, demonstrate the existence of compliance-based policing by fishery officers within the context of a rapidly changing inshore fishery. While compliance-based policing is facilitated through reference to local norms, such norms mean little to nearshore fishers (i.e., those on longliners and inshore draggers) who participate in fisheries which *often* are not community-based.

The employer of fishery officers – the DFO – has been active in not only promoting changes in the inshore fishery, the fishery officer occupation is also undergoing changes. Fishery officers are now being recruited, trained and located in terms of the organizational directives of the DFO. This is placing greater emphasis upon enforcement, or what Reiss (1984) and Kennedy (1990) refer to as deterrence-based policing. In fact, fishery officers are being trained with the Royal Canadian Mounted Police (RCMP).[8] And the officers who have completed this training have given it a positive evaluation (Phyne 1988). One fishery officer who completed the RCMP training program recommended increased enforcement to regulate gear conflicts:

> I did a report last year and I strongly recommend more helicopter patrols for the capelin fishery. [These patrols are] wanted to mediate disputes between fixed gear capelin fishermen and seiners. I did a report for my supervisor and he passed it on to the area office in St. John's (Interview no. 15).

This fishery officer is suggesting a shift from reactive (responding to the community) to proactive (organizational initiative) enforcement in settling disputes. While this approach cannot be attributed to all fishery officers, the DFO is moving towards proactive enforcement. In that sense, it parallels the RCMP's emphasis upon greater bureaucratization and deterrence-based procedures in the policing of small towns and rural areas (Murphy 1986; Apostle and Stenning 1989).

Job quotas have accompanied the introduction of limited entry measures in the inshore fishery. These quotas structure the relation of fishery officers to inshore fishers. While fishery officers use considerable discretion in filling their job quota for the various commercial fisheries (Phyne 1990), attention is being given to stricter enforcement. The Haché Commission reported that inshore fishers wanted stricter enforcement. But, the enforcement measures favoured

demonstrated the variety of conflicts within the inshore fishery. Haché recommended stiffer fines and penalties for violations under *The Fisheries Act*. In addition, the Commission debated the use of a "black box", an electronic surveillance device which can monitor the location and movement of vessels at sea (Haché 1990). Given this, one should not be surprised if fishery officers begin to take more of a proactive stance in dealing with gear conflicts.

Reference to usufruct relations was never part of official DFO policy. However, it was recognized by fishery officers. But the ability to use such relations is clearly on the decline as the DFO completes its belated contribution to the "iron cage" of modernity (cf. Weber 1958).

Conclusion

There are a variety of conflicts in the Newfoundland inshore fishery. Some of these conflicts such as disputes over berth draws for cod traps are structured by the ecological conditions of inshore communities. Here inshore fishers "police" conflicts by reference to informal, usufruct relations. In addition, fishery officers are mobilized by inshore fishers to mediate such disputes.

All disputes are not "policed" through informal rules. Fishery officers have access to formal rules in the regulation of fixed gear disputes and conflicts between fixed and mobile gear users. However, these rules are not strictly enforced; such rules are used as a basis for dispute settlement. Fishery officers refer to the restricted harvesting spaces in inshore waters and the livelihood rights of all fishers as their basis for mediating disputes on the fishing grounds. Compliance is given preference over deterrence.

The source of all disputes cannot be reduced to the coastal geography of inshore fishing communities. On the contrary, state policies facilitated the emergence of a nearshore fleet within the midst of the small boat fishery. This, coupled with the decline in stocks, often results in gear conflicts between the labour-intensive small boat fishery which uses fixed gear, and the capital-intensive nearshore fleet which uses a combination of fixed and mobile gear. In acting as mediators in gear disputes, fishery officers are reproducing a status quo of unequal property relations.

Nevertheless, enforcement is moving away from a compliance to a deterrence-based emphasis. This is reflected in the bureaucratization of the fishery officer occupation and increased calls for more surveillance and enforcement. As a result, one should not be surprised if fishery officers take a more proactive stance in dealing with gear disputes.

The inshore fisheries of Canada are witnessing a decline in usufruct relations. While a wholesale return to usufruct rights is improbable, the way to move ahead is to involve coastal communities more directly in "policing" access to the fishery. Decision-making within the community is ultimately preferable to the dictates of either market-driven capitalism or command socialism, and the bureaucratic ethos espoused by each (cf. Thiessen and Davis 1988).

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Notes

1. Usufruct, or use relations, constitute the use of informal or local rules in the regulation of resources. These rules define common property resources such as fisheries as the property of the community. Community members participate, at an informal level, in regulating access to common property resources. Hence, property rights are not derived from individual ownership. On the contrary, communal rather than individual rights take priority. However, recent public policy is oriented towards undermining communal rights with licensing policies which encourage individual ownership. For more details, see Davis (1984); McCay and Acheson (1987); Matthews and Phyne (1988) and Thiessen and Davis (1988).

2. *The Fishery Officer Career Log* lists the following job responsibility areas: resource management, habitat management, enforcement, public relations, administration, supervision, enhancement and related duties. For more information on these job areas, see Phyne (1988).

3. The Newfoundland Region consists of the east, northeast and south coasts of the island of Newfoundland, as well as all of Labrador. The west coast of the island of Newfoundland is administered from the Gulf Region, which has its headquarters in Moncton, New Brunswick.

4. Among the sampling population, there were 27 senior officers and 54 junior officials. There were also four recruits. An attempt was made to interview all of the senior fishery officers. In addition, on the basis of a proportionate sampling method, an attempt was made to interview 50 per cent of the junior fishery officers from the three administrative areas of the island portion of the Newfoundland Region. Interviews were conducted with 23 senior fishery officers, 25 junior fishery officers and 3 recruits. Since the DFO considered the latter to be junior fishery officers, they were included among those officials in the analysis of the data. For more details on the research design and sampling methodology, see Chapter Three in Phyne (1988).

5. While the inshore dragger fleet has a noticeable presence in the shrimp fishery of northwestern Newfoundland (see Sinclair 1985), this fleet has rapidly expanded in the inshore fishery of southwestern Nova Scotia (see Haché 1990).

6. The Haché Commission (1990) was established to investigate the crisis in the groundfishery in the Scotia-Fundy Region. (The region includes all of Nova Scotia with the exception of the waters on the Gulf of St. Lawrence. It also includes the Bay of Fundy Region of New Brunswick.) The crisis became apparent in the late 1980s with the rapid depletion of groundfish stocks including: cod, pollock and haddock. The crisis was attributed to a number of factors, especially to the expansion in the capacity of inshore draggers in southwest Nova Scotia. Haché stated that stricter controls be placed on the capacity of the inshore dragger fleet. In addition, he recommended that greater surveillance of inshore waters be conducted by the DFO. Critics also claim that the decline in groundfish stocks is due to overfishing by foreign and domestic offshore trawlers.

7. Kearney (1989) points out that disputes over limitations in the lobster fishery in southwest Nova Scotia are still a point of contention between different fishers' organizations and the DFO. The differences between Newfoundland and southwest Nova Scotia, and the implications of such differences for the discretionary role of fishery officers is expanded upon in Phyne (1990).

8. All federal fishery officers have to take a six week training program with the Royal Canadian Mounted Police, Canada's national police force. This program emphasizes: weapons training, self-defense, legal instruction and defensive driving. At the time of this research, 52.9 per cent (n=27) of the officers interviewed had taken this training program.

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Discussion

Comment on Sinclair's "Fisheries Management and Problems of Social Justice: Reflections on the Northwest Coast of Newfoundland"

(*MAST* 3(1):30-47).

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It is hard to quarrel with Sinclair's main thesis that fisheries policy is, in essence, social policy and that the core of fisheries policy and the proper management of the resource rests, or should rest, on a broad understanding of how people in fishing regions make a living.

But it is no contradiction to say that, like the Russian doll, inside the social core lies, or should lie, another consisting of the ecological.

In Canadian fisheries policy formulation, certain biological factors, such as the total stock biomass, are often taken as constraining factors. But general ecological concerns are not taken as relevant, let alone decisive, in establishing the limits of our intervention into the marine resource complex.

Indeed, fisheries biologists are only now starting to recognize, and struggle with, the ecological relationships between related commercial fin-fish species (e.g., the predator/prey relationship between cod and caplin). These first steps at multi-species management show clearly that the very conceptual structure of present day fisheries management techniques makes a more innovative approach very hard to conceive, let alone achieve, however necessary such a new start may be.

But it should be well worth the effort, as I suspect that a "start with the ecology first" approach would be a powerful tool in reorganizing our thoughts as to how we should approach proper fisheries management issues generally.

In the past, when the level of fishing effort and the type of technology in use were, at least in a general sense, relatively less harmful to the marine ecosystem, such an approach may not have been as necessary.

But with the escalating change in modern fish catching technology, this is no longer the case. This is particularly true with respect to the complex of electronic/mechanical technologies which, since the Second World War, have been added to the much older bottom-dragging trawl technology.

As with the Gulf cod stock discussion by Sinclair, similar, if nor quite as advanced, problems exist with respect to the much larger cod stocks which reside on Newfoundland's east and Labrador coasts - the so-called northern cod stocks.

On the basis that fisheries management is as much an environmental issue as anything else, the Newfoundland Inshore Fisheries Association (NIFA) (un unlikely coalition of inshore fishermen, fish plant operators, fish plant workers and others) has worked to de-

velop links with such main-line environmental groups as Greenpeace, the Canadian Environmental Defense Fund, the Worldwide Life Fund and others.

From an ecological point, the east side of the Gulf of St. Lawrence, the area of Sinclair's study, is relatively small and capable of definition and study. As well, the limited range of catching technologies, user groups and regional interests should admit of clear analysis, leading to more effective decisionmaking.

For instance, the entire migratory range of the commercial stock of most interest, the so-called 4RS/3Pn cod, lies solely within Canada's 200 Mile Limit. Thus failure in management can not be attributed to the depredations of the "evil" foreigner.

The 4RS/3Pn cod stock winters in the area known as 3Pn on the southwest coast of Newfoundland (Cape Anguille to Burgeo) and then, for the most part, migrates north to spend its summers in the northeast corner of the Gulf (4R) and along the lower North Shore of the Province of Quebec (4S). It reportedly spawns in early spring at the midpoint in its range (4R).

Prior to the 1950s, the fishery on this stock was pursued in the main as follows.

During the winter, there was a highly-successful Lofoten Islands-style, hook and line fishery on concentrations of cod along the southwest coast from Cape Anguille to Burgeo mostly by local, small boat fishermen.

During the summer, there was an equally-successful inshore, small boat cod trap fishery 250 miles to the northwest on the west side of the Northern Peninsula of the Island of Newfoundland and along the Lower Quebec North Shore.

The levels of effort and types of technology used in these traditional fisheries did not apparently harm the stock or its relevant ecosystem.

However, when large-scale, mainly European, trawler activity began in the early '50s, the stock started to decline. This continued until the declaration of Canada's 200 Mile Limit in 1977, subsequent to which there was a rebuilding of the stock; catches reached a post-1977 (some say historic) peak of 106,000 in 1983.

Unfortunately, as Professor Sinclair has alluded, in the early 1980s, the Federal Government of Canada adopted a policy of promoting an inshore dragger fleet (less than 65' in length) which has not only ruined the fixed gear fishery in the Northeast Gulf but also the winter hook and line fishery on the southwest coast. Catches for all sectors have decreased to 47,000 tons in 1989 and will be even lower in 1990 (Advice 90/5); in 1990 winter hook and line catches were virtually nonexistent.

On this basis, Sinclair's analysis of impacts in the northeast Gulf should be extended to the impact of the inshore dragger fleet on the fixed gear winter fishery on the southwest coast.

That such an internal Canadian catastrophe should occur raises many questions as to the methods used by Canadian fisheries managers. The current system seems to suffer greatly by the fact that fisheries scientists do not have sufficient independence from the political arm of the government.

Under pressure to react to annual quota debates basic ecological and biological studies play second fiddle to attempts to mathematically model the stock size. And because basic research principles have not been followed, in spite of this stock's limited range those factors influencing year-class success and the health of the stock generally are insufficiently known.

And further, the mis-reporting of catches and excessive levels of discards in the inshore dragger fishery, brought on by lax enforcement, have ironically reached such levels that the output of fish population models, which are based largely on catch per unit of effort statistics generated by the inshore dragger fleet, has been completely compromised.

To compound the problem, there is no effective communication of such biological and ecological information as is known by government to fishermen. Nor, perhaps more damaging, is there any attempt by managers to incorporate the wealth of knowledge of inshore fishermen as to the habits and state of the stock into their resource analysis.

Fisheries scientists/managers and fishermen live as two solitudes – to the detriment of both.

A large part of this problem arises from the fact that current fisheries management techniques do not have the ability to generate a fish population model based on traditional inshore fixed-gear catch statistics. These are available in profusion, partly in the written record but also just as accurately in oral tradition, virtually all of which information lies completely outside the ambit of the current analytical skills of fisheries biologists.

Such information does, within their intellectual framework, simply not compute.

The literature does not seem to contain much discussion of how such traditional knowledge of fish stocks and the sea can be utilized in the so-called "modern" fisheries management process, although Johannes has directly touched on this subject in relation to traditional conservation measures in Oceania (Johannes 1978) and Stoffle has discussed this in terms of "ethnoscience" (Stoffle 1986).

Based on my experience with the northern cod fishery on the east coast of Newfoundland, the knowledge base and perception of inshore fishermen in relation to shoreward or coast-wise migrating species and related hydrographic phenomena seems of exceptional quality.

Perhaps, then, it is not out of place to suggest that a collaborative effort is needed involving social scientists and fisheries managers of a biological and mathematical bent, not so much, as so often has been discussed, as to ascertain the social impact of various management options, but concentrating more on the manner in which ecological, catch and other relevant data can be collected from fishermen and used in the management process. Similarly, the whole social and intellectual context in which fisheries scientists and fishermen interrelate is deserving of attention (Durrenberger and Pálsson 1987).

From the Newfoundland experience, there appears much that fisheries managers can learn from both fishermen and social scientists – historians, geographers, anthropologists and sociologists alike.

It is hard to overestimate how important the development of such a collaborative effort would be. In the current context, fisheries biologists have inadvertently created, out of their special, yet extremely limited knowledge of the physical world, a virtual priesthood and traditional fishermen invariably suffer. This is not what many fisheries biologists really want and it need not be

In the specific case under study by Sinclair, the inability of 4RS/3Pn cod stock managers to use inshore fixed gear catch data for biomass calculation and a willingness instead to continue to attempt to use admittedly flawed trawler-catch based models is typical of the Canadian fisheries management system.

One suspects, that this dependency on modelling and analytical techniques which were initially developed to analyze North European trawler fleet/fish stock interactions is more a matter of intellectual dependency than anything else.

Indeed, one is led to speculate on the impact of current fisheries modelling dogma when imported into developing countries and where past experience in local, supposedly "underdeveloped," fisheries seems most always brushed aside.

In the west Newfoundland context, the coast-wise migration of fish and long history of the fixed gear fishery should provide an alternative and probably better basis of analysis.

This is equally, if not more, the case with respect to the northern cod stock which annually migrates inshore where it has been caught in cod traps for over a hundred years. The use of permanent trap "berths" and the relative stability of the cod trap technology would seems to make historical analysis of the biomass of this stock using the written record and oral tradition of trap landings a definitive possibility.

NIFA is currently organizing an extensive cod trap research project to test this hypothesis in collaboration with social scientists at Memorial University, St. John's and several hundred cod trap skippers (there are 1600 in total).

In West Newfoundland, it is absolutely clear that inshore fishermen must be brought into the management process front and center, not only to preserve social equality, but to create techniques of fish stock analysis that are realistic and actually work. Canadian fisheries scientists, working by themselves, have proven existing techniques to be intellectually bankrupt.

This "access to traditional expertise" benefit is additional to, but supportive of, the benefits of better compliance and enforcement as discussed by Sinclair.

In west Newfoundland, this would be the first and vital step and should lead quickly to the second, which would be to create a clear picture of the *potential size* of commercial stocks *in their restored state.*

This is vital, not only so that appropriate and practical ecological, biological, social and economic goals can be established, but also simply to create a positive tone to help offset the present dismal social context.

While this may sound simplistic, such goal setting could be extremely beneficial. For there is presently a terrible tendency for even younger inshore fishermen, let alone distant fisheries bureaucrats, to forget how abundant the cod and related stocks were, say, thirty years ago, prior to the coming of the foreign draggers in the late 1950s, a state which presumably can, more or less, be again achieved with wise management in spite of current stock conditions.

This tendency to forget past abundance is, if anything, even more prevalent in other parts of Newfoundland and Labrador and is, of all things, most corrosive of any will to change things for the better.

So while goal setting and improvements in management structure may, in the context of catch failure and poverty, seem secondary, this strategy constitutes perhaps the best lever by which an otherwise unresponsive management system can be moved.

I suggest, for instance, that use of a different approach in the early 1980s, one that included goal-setting and a stock or ecological impact assessment process, would have likely produced a far different result.

While now seldom admitted, the development and movement of the inshore dragger fleet into the southwest coast winter fishing grounds was a deliberate policy choice by fisheries managers. It seems to have been based partly on a sincere, if pathetic, belief in the need for fishermen in the area to adopt a more "modern" technology. One can, after all, question the automatic adoption of new technology without being an unthinking luddite or romantic (Serchuk and Smolowitz 1990).

And, of course, this choice of technology was made without analysis as to its ecological and social impacts. This failure is quite apart from Ottawa's parallel failure to adapt its "traditional" management measures to the efforts of this new fleet – apart, for instance, from the failure to police and curtail the use of small mesh liners, mis-reporting and the dumping of small fish.

Sinclair has already analyzed the questions of social inequality which developed within the fishery; an ecological analysis would have added other questions.

For instance, there are growing concerns as to the impact of bottom disturbing trawl gear on the health of benthic communities and the marine ecosystem generally (Effects 1990).

Additionally, a recent analysis of the impact of trawl gear on the reproductive capacity of cod, at the very least, raises a number of very serious questions (Fahraeus-Van Ree 1990).

Do bottom-dragging trawls, through noise, physical disruption and the clouds of mud raised by the warps and otter boards seriously effect the short-term reproductive capacity of those fish which are not caught? Significant stress-induced infertility has been observed by researchers in the handling of cod in captivity, but these observations may not be relevant to the impact of trawl activity (Kjesbu 1989).

Consequently in this case, a broader ecological review of the inshore dragger technology would have included an analysis of the impact of bottom dragging trawls on benthic organisms and the effect of the use of such trawls on the cod's spring spawning grounds.

Encouragingly, the Federal Government of Canada now intends to study both these areas in respect of the northern cod (Dunne 1990).

But it is a long way from initial study to the full incorporation of such aspects into management criteria. And surely, the fact that such basic ecological factors were, and are, not analyzed as part of the normal fisheries management process demonstrates a great gap in our understanding and competence in these matters. Fishermen have been voicing their concerns on such issues for years.

So Sinclair has quite rightly focused on the decision-making process and how its defects can lead to self-destructive strategies, as so obviously has taken place in this particular case.

However, to his analysis, the addition of a few words on "onus of proof" seems appropriate.

In Canada, fisheries managers often demand that traditional fishermen "prove" or "show" that a new fishing practice or piece of technology, which government wishes to licence and to which fishermen object, would be harmful to stocks before managers would consider banning or restricting its use. Inshore fishermen have been asked, for instance, to "prove" that trawling hurts the cod spawning process – a virtual impossibility for underfinanced inshore lobby groups.

However, a far different approach is used in the assessment of the anticipated environmental impact of federally-regulated projects on land.

In such cases, if there is a reasonable and genuine cause for concern, the proponent of a project bears the onus of showing that environmental protection standards would be met.

This is not the place to debate whether or not Canada's current legislative scheme is effective in providing a reasonable degree of environmental protection with respect to projects on land. We can say, however, that such a process, at the very least, puts some degree of onus on the proponent of change to examine and explain the impact of their proposed actions.

So it is not enough to attempt to anticipate the "progress" of technological change as recently discussed by Whitmarsh (1990). Rather, we need to predict as best we can the impact of such changes and restrict or ban as needed.

No such onus was upon federal fisheries managers, or on the prospective owners of the first inshore draggers when they entered the cod fishery in the northeast Gulf. Nor did it exist when these vessels later entered into the fishery on the winter fishing grounds on the southwest coast.

One suspects that if such a review had been required, this highly-destructive technology – destructive both ecologically and as to social equality – would have been rejected.

Indeed, in terms of the maintenance of some semblance of social equality, it is absolutely essential that traditional inshore fishermen be given an effective voice in a fisheries management process which uses a "what is going to happen if we" approach.

And, although not a form of "co-management" as discussed by Sinclair and others (Jentoft 1989), here again, Canada's environmental impact assessment process may offer a conceptual framework for an initial and substantial improvement in the present regime.

If, under the current Canadian Federal environmental impact assessment legislation, there is a substantial level of public concern as to the licensing of a new technology or project, the proponent (including Federal Departments) must prepare and make public an environmental impact statement setting out the expected impacts of the proposed action.

This document is then subjected to a public hearing process before an independent panel appointed by the Federal Minister of the Environment, independent of the proponent Minister.

Now, in Canada, the Minister of Fisheries and Oceans is traditionally an unchallengeable fisheries czar wielding enormous power over some of Canada's poorest and most politically disenfranchised citizens. Under the Canada Fisheries Act, the issuance of licences and establishment of quotas (both overall and individual) are entirely at the Minister's discretion.

Measured against the criteria set out by FAO's Advisory Committee on Marine Resources Research (ACMRR) in its comprehensive Report of March 1983, Canada's current regime is regressive and predictably ineffective (Lieberman 1966). Management of the Atlantic salmon fishery provides one example of Ottawa's reluctance to share real power with fishermen (Felt 1990).

The application of Federal environmental impact assessment law to the actions of the Federal Minister of Fisheries and Oceans would be an effective counter to the improper exercise of that power.

Indeed, the issue of the application of such laws to the Federal Fisheries Minister is now before the Federal Court of Canada (*NIFA, Martin and Bartlett* vs *Minister of Environment for Canada and Minister of Fisheries and Oceans for Canada*, Federal Court of Canada, F.C. No. T-2719-89).

And whatever the law now is, what it should be is clear.

And these are not novel thoughts. The United States has, from the very declaration of its 200 mile zone, required, via the *Magnuson Fishery Conservation and Management Act* of 1976, that relevant economic, social and ecological factors be assessed *prior to* important fisheries management decisions (Vanderpool 1981, 1986). And it is no argument against such an approach that the complexities of the USA management regime have prevented the inclusion of such analysis from being as effective as it might otherwise be.

Public hearings to review a published environmental impact statement would focus both user groups and fisheries managers on the ecological and social equality implications of various decisions before they are in cast stone.

This would seem a necessary, and adequate, way of negating the superior lobbying power which seems inevitably to accrue to those in the fishery who "accumulate capital," often in the form of larger boats and limited entry licences.

These comments are in no way meant as criticisms of the excellent paper by Sinclair under review. Nor is it meant as an attempt at learned analysis. But it is meant as a plea

on behalf of inshore fishing people and communities who are in desperate need of better fisheries management and through it, the chance to regain some semblance of control over their lives and futures.

Far from being in the nature of frills, analysis of such problems by the academic community is essential to the survival of traditional fisheries and fishing communities and to the maintenance of healthy marine ecosystems.

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Book Reviews

PINKERTON, Evelyn (Ed.) *Co-operative Management of Local Fisheries: New Directions for Improved Management & Community Development*. Vancouver: University of British Columbia Press. 1989. ix-299 pp.

Most fisheries nations struggle with basically the same problem, how to promote economic development in marginal, and often impoverished, fishing communities, and at the same time, avoid over-exploitation of the fish stocks. A key word here, launched by the World Commission on Environment and Development set up by the United Nations, is "sustainable development," a "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (The World Commission on Environment and Development, *Our Common Future*. Oxford, New York: Oxford University Press, 1987, p. 43).

In few other industries is this challenge more pressing than in the fishery. From experience we know that resource depletion has often been the long term effect of well-intended development strategies aimed at helping the poor. From numerous cases we know that efforts to control the resource base have led to community decline. This because restrictions on access to the fishery have benefitted large scale operators at the expense of small scale ones. Also, endeavors to ensure over-all planning and control have often resulted in top-down management practices which have alienated those whose survival depends on the fishery. Such consequences are, again following the World Commission, contradictory to sustainable development, which in order to be effective, requires "... effective citizen participation in decision making" (p. 65).

For the present international debate on the environmental crisis, triggered largely by the World Commission, Evelyn Pinkerton's book comes at the right time. The book also adds a new dimension to the political and academic debate on the commons problems as it has been experienced in the fishery. In both instances, workable solutions to the development/management/participation dilemma are needed. Before such solutions are found, one should not expect practical results in accordance with the criteria of the World Commission.

Here, Pinkerton offers the co-operative management approach: a decision-making process which involves local communities and groups of fishermen in a participatory and responsible fashion. Co-management means delegation of management authority to local groups, or the formal recognition by government of indigenous local management systems. By institutionalizing co-management, central-local relationships among the actors in the fishery, as well as the relationships that exist among individual fishermen and among fishermen's groups, are fundamentally altered. Co-management "is power-sharing but it is also responsibility-sharing" (p. 278).

For Pinkerton, co-management is a multi-purpose tool which will provide more effective, more equitable, and more appropriate management. These are indeed common concerns of both government and fishermen. In particular, she argues, co-management promotes conservation and enhancement of fish stocks, improves the quality of data and data analysis which are needed for stock estimation, reduces excessive investments by fishermen in competitive gear, makes allocation of fishing opportunities more equitable, promotes community economic development, and reduces conflicts between government and fishermen, and conflict among fishermen's groups.

Given the many failures of fisheries management schemes in the past, one may think

that this is too good to be true. In theory it sounds great, but does it work in practice? Pinkerton admits that co-management is a difficult process, and that there are many pitfalls and problems to be overcome. In her opinion, it is therefore essential to be aware of the preconditions which are favourable to co-management, and which arrangements are most favourable to maintain it.

Grounded in the many empirical examples and practical experiences of co-management described in the book, she develops a long list of propositions of what contributes to successful management. To mention a few, co-management operates most favourably where: the mechanisms for conserving and enhancing the fishery can at the same time conserve and enhance the operation of the cultural system; the number of fishermen or communities is not too large for effective communication, or where there are well-organized sub-groupings (villages, kinship groups, organizations) which communicate well with each other or have effective umbrella organizations; a higher (possibly citizens') authority can act as an appeal body on local equity studies.

The book is an edited volume of sixteen chapters, containing a variety of analytical case-studies and descriptive examples of co-management agreements. All the case-material is from Canada and the United States and most of them (except three) involve aboriginal groups exercising treaty or aboriginal rights in harvesting and managing fish on a small scale. This makes generalizations to other contexts somewhat difficult. It is argued, however, that even though aboriginal fishermen do have a head-start on co-management because of their kinship and territorial systems which define group boundaries as well as the obligations of members of the group, co-management may also be effective in non-aboriginal groupings. The question of whether or not co-management will work, and under what conditions, in a highly mobile, industrialized fishery is not addressed. Following the argument in the concluding chapter (co-authors Bruce Rettig and Fikret Berkes), no fishery can be managed effectively without co-operation of fishermen. Considering the specificity of the aboriginal case as merely a head-start, however, seems to be an over-simplification in light of the vast differences from the main commercial inshore and offshore fishery.

The authors include academics of various disciplines as well as practitioners of fisheries management. This is both a strength and a weakness, at least from the perspective of a foreigner. Half of the chapters are written by people with a hands-on experience of co-management, but with no training in social science. It strengthens the case for co-management when it is advocated by people who have really tried it in practice but it also means that general insights and analytical points are less developed than one may have preferred, particularly for the purpose of comparative research. However, this is well balanced with a good introduction and conclusion which summarize the lessons to be drawn from these case-studies, as well as the more academic papers.

In my view, Pinkerton's book brings the debate on fisheries management a step further, and should be inspiring to researchers as well as fisheries managers on this side of the Atlantic as well as in North America. It also suggests a practical approach to many of the problems of economic development and environmental protection addresed by the World Commission. Thus, it has a message to the public at large and not only to people with special interest in fisheries.

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JOENSEN, Joán Pauli *Fra bonde til fisker. Studier i overgangen fra bondesamfund til fiskersamfund på Færøerne.* Tórshavn: Føroya Fornminnissavn, 1987. 159 pp., English summary. (From Peasant to Fisherman. Studies in the Transition from a Peasant Society to a Fishing Society on the Faroe Islands. Ph.D. Dissertation, University of Aarhus).

This book is a piece of long-term research in two ways. First, it deals with developments on the Faroe Islands over a long period (1800-1939). Secondly, the author has worked with this material for several years and published books and articles in Faroese, Danish, and English about aspects of this society. The present dissertation is not an original piece of research, but a compilation of the main findings during the past ten years. There can be no doubt about Joensen's enormous firsthand knowledge of Faroese society, history, and culture. Yet, the book is disappointing both as measured against its declared intentions and as measured against norms for scientific work.

The title indicates a study of change. The list of contents suggests a systematic approach. The introduction promises a combined ethnological, historical, and structural investigation of the transition from peasant society to fishing society in which the material, social, and spiritual aspects of culture will be examined within a holistic and comparative perspective. Various forms of consciousness and cultural articulation will be investigated and related to different categories of the population. Cultural variation, change *and* continuity will be viewed against the background of forms of production, conditions of housing, leisure spenditure, spiritual values, lifestyles, conditions of life, etc., etc. (p. 9). These are almost breathtaking intentions, very interesting and very ambitious. One would have liked a study like that.

As it is, Joensen has bitten off more than he can chew. The book contains no processual analysis, no holistic approach to culture, and no comparative perspective. The author seems to be caught up in the schism between painting a "representative and multi-faceted picture of all kinds of aspects of life on the Faroe Islands" and presenting an ethnological analysis of the material. The latter implies selecting a focus for the ordering of material, it implies selecting analytic concepts for the interpretation of findings, and it implies presenting an argument that relates to the research findings from different, yet comparable communities elsewhere. This is not done. Instead we are presented a flat and very insular compilation of Joensen's no doubt tremendous knowledge of these islands, lacking in depth, focus, and spice.

The "old and stable" peasant society is Joensen's point of departure (quotation marks mine). In this society, households were largely self-supporting, knitting being the only cash-yielding activity. Ownership of land defined fishing rights and the rights to whaling and driftwood, extremely important resources in this bare and windy environment. Trade was monopolized by Danes, and the Faroes were then an extremely isolated and semi-colonial island-society under Danish administration. Although there would appear to be some differences in power and wealth, Joensen characterizes Faroese society of the 18th and 19th centuries as a "unitary culture": a fortress of traditionalism saturated by Lutheranism. The turning point in this stable peasant society is the abolition of the Danish trade monopoly and the introduction of free trade in 1856. This enabled merchants to establish shops, where fish soon became the currency with which imported goods were obtained. Faroese fishermen and merchants started to invest in ships for deep-sea fishing, and the fishing fleet grew tremendously in the last two or three decades of the century. Farm hands increasingly left the farms to engage in fishing. Farming slowly lost its importance but in this transitional phase the economy of most households was still based on both farming and fishing. Fishing involved entirely different relationships between em-

ployers and employees. To avoid paying cash wages, employers developed the so-called truck-system, by which they urged employees to accept goods from their own shops instead of wages. Later this truck-system developed into the credit-book system, by which a fisherman exchanged his labour power for credit facilities in the shop. These systems cracked in 1929 with the world crisis, while at the same time trade unions became more important.

Along with these changes in the economic sphere, the Faroes gradually became less isolated. There were thin layers of society where middle-class culture dominated, but no great changes occurred in the daily life on the Faroese population in general. Yet, Joensen writes, the tension between folk culture and middle-class culture "gave rise to a romantic national movement which in time assumed a political aspect, and a conscious Faroese national culture emerged" (p. 155).

These, in short, were the main lines along which Faroese society developed when changes started to "appear" after 1865. In Joensen's treatment they literally appear, almost like *dei ex machina*. Merchants "appear," roads, harbours and knitting machines "come," changes in the system "happen," social differentiation "arrives in the population," the plough is "introduced," and the bourgeois way of life "comes" (p.76). Some changes do not "come," because - Joensen explains - "people were not ripe for innovation"(!), or because "there was opposition against it" (p. 40). My point is that a "from-to" description with in-between the "appearance" of changes can hardly be said to constitute a processual analysis of a transition. One important reason is that in Joensen's study there are no actors up against other actors, no specified interest groups conflicting amongst each other, no local level politics. Whaling, cod fishing, hay collecting, investment in shops and ships, and the spread of bourgeois culture - it is all described, but without any sense of the dynamic relationship between people and groups competing for scarce resources. In the end, we have a changed society, indeed, but we are still ignorant as to *how* things changed, *who* did what, and *why*. This basic criticism goes for the entire book, but it is most serious when it comes to the lack of information on the group of "merchants," because they seem to be central in the transiton from farming to fishing, which is really a process of commercialization. In this process, capital is needed and people willing to risk that capital (merchants, shopkeepers, innovators, or entrepreneurs - they have been called many names in the anthropological literature). Given the semi-colonial situation, the demographic pressure with its ensuing proletarization, and the "traditional" division of power resources - three lines along which this transition might have been analyzed more systematically and more dynamically - it is essential to know *who* these merchants were and how they were recruited (Robert Paine wrote a most instructive study in the 1960s about very similar processes and activities along the Norwegian coast, to which, however, no reference is made). Were they immigrants or where they local men, ex-landowning peasants, or something else? How did they acquire the capital needed, and whom were they up against? Were *they* the carriers of bourgeois culture? And how did this group relate to the emerging Faroese national culture? Joensen gives no clear and specific answers to these and similar questions which are central to his enterprise.

A comparative perspective is missing altogether. It is surprising that no reference is made to research findings produced by scholars from universities specializing in North Atlantic fishing communities, like Memorial University in Newfoundland and Tromsø in Norway. Joensen acknowledges having been inspired by Le Goff, Löfgren, and Barth (the latter mentioned, but missing in the bibliography). However, neither the working methods, nor the research findings of these scholars are integrated in Joensen's presentation of material. They appear only to function as figureheads in the introduction. Instead Joensen continuously refers to Joensen.

Joensen typically begins a chapter by telling the reader that he has already dealt with all this before. Instead of summing up the relevant findings from this or that previous study, he refers the reader to his publications (10 random pages yielded an average of 6,4 references a page to Joensen himself). Thus the book is full of statements, the validity of which the reader cannot judge. This becomes boring and even irritating, not in the least because of poor language (misspellings, wrong use of terms, ever shifting tenses and use of non-existing words). The limit of sloppiness and non-scholarship is reached in the closing pages. Here Joensen summarizes the occupational differentiation which has evolved in Faroese society by taking over a page-long enumeration of occupations from the 1938-39 telephone-book - *b*akers next to *b*anks, *b*arbers, and *b*oat-builders (p. 132). Easy does it!

In short, as a dissertation this study is not convincing, lacking as it is, not only in argument and theoretical discussion, but also in language and style.

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MARCHAK, Patricia, Neil GUPPY and John McMULLAN (Eds.) *Uncommon Property: The Fishing and Fish-Processing Industries in British Columbia*. Toronto, New York, London, Sydney and Auckland: Methuen. 1987. xvi, 402 pp. (tables, figures, index), paper. ISBN 0-458-80991=0-X.

This is one of those books that is so good that it is likely to displease those in the policy business who read it. I can already hear Canadian fisheries bureaucrats saying that this team of sociologists does not understand the fishing industry. They understand it all too well. In contrast to the disparity exhibited by many collections, especially in economic anthropology, this book benefits from the shared analytical framework of political economy. Using intensive community studies, analysis of state statistics, historical materials, records and observations of meetings, in their fifteen articles, the seven contributors (the three editors and Stephen Garrod, Alicja Muszynski, Evelyn Pinkerton, and Keith Warriner) concentrate on describing the history and functioning of the fisheries of British Columbia rather than vacuous abstractions or fatuous "theoretical" debate, which makes this book a bonanza for anyone interested in fisheries, modern economics, economic history, relationships among native peoples and states, and formation and control of public policy and its effects.

The writers do not uncritically accept the definitions of reality offered by processors, policy makers, bureaucrats, or fishermen. In the introduction Marchak argues, contra fishermen and state ideologies, that the fishery is not common property, and that the issue is not the tragedy of the commons but the mismanagement of state or crown property. While the fishery is only a small portion of B.C.'s economy, a substantial number of biologists have interests in maintaining government machinery that costs about as much as the landed value of the catch. The government spends as much on bureaucrats as the fishermen produce.

In the first section about capital and the state, McMullan provides a history of work organization and relationships with the developing area infrastructure, packing industry,

markets, fishery stocks, and fishing technologies. Muszynski describes the history of the relations of the processing industry with evolutions of railroads, technology, capital, European markets, fishing and processing in the United States, and sources of labor. Pinkerton connects a number of such structural dimensions in her discussion of oligopolistic pricing and degrees and methods of vertical integration. Garrod examined relationships among consumer tastes, relative values of national currencies, tariffs, and salmon farming to assess the evolution of B.C.'s status in the world salmon market since the 1950s. McMullan chronicles the shifting relations between government policy and capital in the salmon fishery to show how recent policies have reduced the fleet but increased catching capacity, commoditized the right to fish, strengthened the dominant position of one packing firm, and contributed to the subordination of fishermen to result in rapacious overfishing and destruction of stocks. The remedial efforts beginning in 1975 followed the formula "More state capital = more fish = more capacity = more concentration ..." (p. 147). The inconsistencies and paternalistic ad hoc policies, decision-making, and administration of biologists and bureaucrats of the Department of Fisheries and Oceans convinced fishermen that the state was uncaring and incompetent which contributed to their resentment, mistrust, and resistance to regulation. Marchak recounts how the shared military interests of the USSR and the United States, the ascendency of a U.S. mining lobby during the Reagan administration, access to oil, fears of oil spills, and other concerns shape Canadian-U.S. and international fisheries questions.

In the second section, on labor and organization, Guppy explores variations among fishermen's gear types, income, education, alternative employment, access to state unemployment insurance schemes, and attitudes. He examines the myth of individualism and shows that fishermen are integrally dependent on families for access to boats, labor, and linkages with shoreworkers as well as processors. In the next chapter he characterizes processing work and workers ashore, their gender and ethnic divisions, the extreme volatility of the work, and the decreasing influence of family connections among workers as processing has relocated in urban areas. He illustrates the arbitrariness of gender divisions by pointing out that filleting is considered men's work on the Atlantic but women's work on the Pacific. Marchak describes the tangle of fishermen's organizations, unions, and cooperatives and how they have had mutual and conflicting interests over time. Pinkerton shows how Indians are united by continuities in non-cash economic and related social and political forms but divided by such schisms as gear types in the larger fishery. Muszynski chronicles the development of the United Fishermen and Allied Workers Union (UFAWU). In the United States, fishermen unions were effectively outlawed by anti trust litigation which found fishermen to be firms which could not collude to fix prices (p. 275). The UFAWU included processing workers so they had some legitimacy as representatives of labor as well as the power to close processing plants to back up fishermen demands.

In the third section about community and region Pinkerton discusses two communities on the west coast of Vancouver Island that are dependent on fishing and how fishing pervades the social fabric as well as economy of each. Fearing the competition of a local enterprise, a large processor caused the Agriculture and Rural Development Agency (ARDA) to delay a half million dollar payment, whereupon banks refused to pay creditors thus making certain their fears of the firm's bankruptcy would be realized. Here the hand of business in policy and policy determining conditions of business is clear. Business is not so much at stake in Ahousaht, an Indian community where fishing is like a total institution, entering many aspects of the social order from socialization to residence. On this island where the whim of a fisheries policy maker is directly felt through the community,

the residents are united in their opinion that fisheries management policies operate their detriment. Warriner explains that British Columbia's economy is a peripheral hi terland governed by the political and economic interests of metropolitan Vancouver ar Victoria. Marchak reviews developments since the Davis Plan in 1968, whose buy bacl had been more than compensated for by the upgrading of the fleet with government subs dies and loans. Conservation was a rhetoric of justification for the 1968 policy, droppe abruptly for fleet modernization when processors demanded it. Native claims and th bankers fears of having bad loans or repossessed boats take precedence over conservatio since a 1985 policy provides financial aid to Indians to buy boats and pay debts. Th government yielded fishing rights in return for forestry rights, which Indians had contes ed, and which large corporations insisted upon having to themselves. The policy woul also benefit the one major processing firm and reduce the bargaining power of the unio The conclusion to the paper is an apt summary of the whole book:

> The contradiction is in the property rights of the fishery: the provincial government has formal ownership of land and resources; the federal government claims formal ownership of the fish and of the right to allocate fishing licenses; private individuals with licenses are obliged to compete for capture; and captured fish, now as commodities, are private property. The whole situation is further complicated by the ideology of common property and by the efforts of federal conservation officers to save the fish in the name of common property. The complexities mount when the private property interests of other industries and other users of the fish habitat are brought into the picture. ... Fishers ... have tried to work out their common interests and resolve their internal conflicts. ... What they need now is an equally serious commitment by governments to a genuine consultation process.

Each study is well articulated and meshed with all of the others but independent o them so one can understand individual chapters without reading the whole volume. Th effort the collaborators put into organization has paid off in overall coherence. The or ganizers no doubt had this in mind rather than trying to develop a single organizationa scheme for the work as a whole that would make each contribution dependent on th overall structure and its place in it. Only those who read the book straight through wil detect the slight repetition this entails.

One theme that recurs is the nature and place of petty commodity production, house hold production as opposed to firms, which has been and remains economically and so cially important and politically significant. These co-workers allocated their resources time, and patience best to analyze the structure that contains such forms and its history to transcend the worm's eye view of local ethnography. To have provided such analyses would have over-loaded the volume, so I hope we can look forward to further work from this group.

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