26

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TOPIC : LEGAL ASPECTS OF THE CONSERVATION AND EXPLOITATION OF OFF-SHORE LIVING MARINE RESOURCES IN ANTARCTICA

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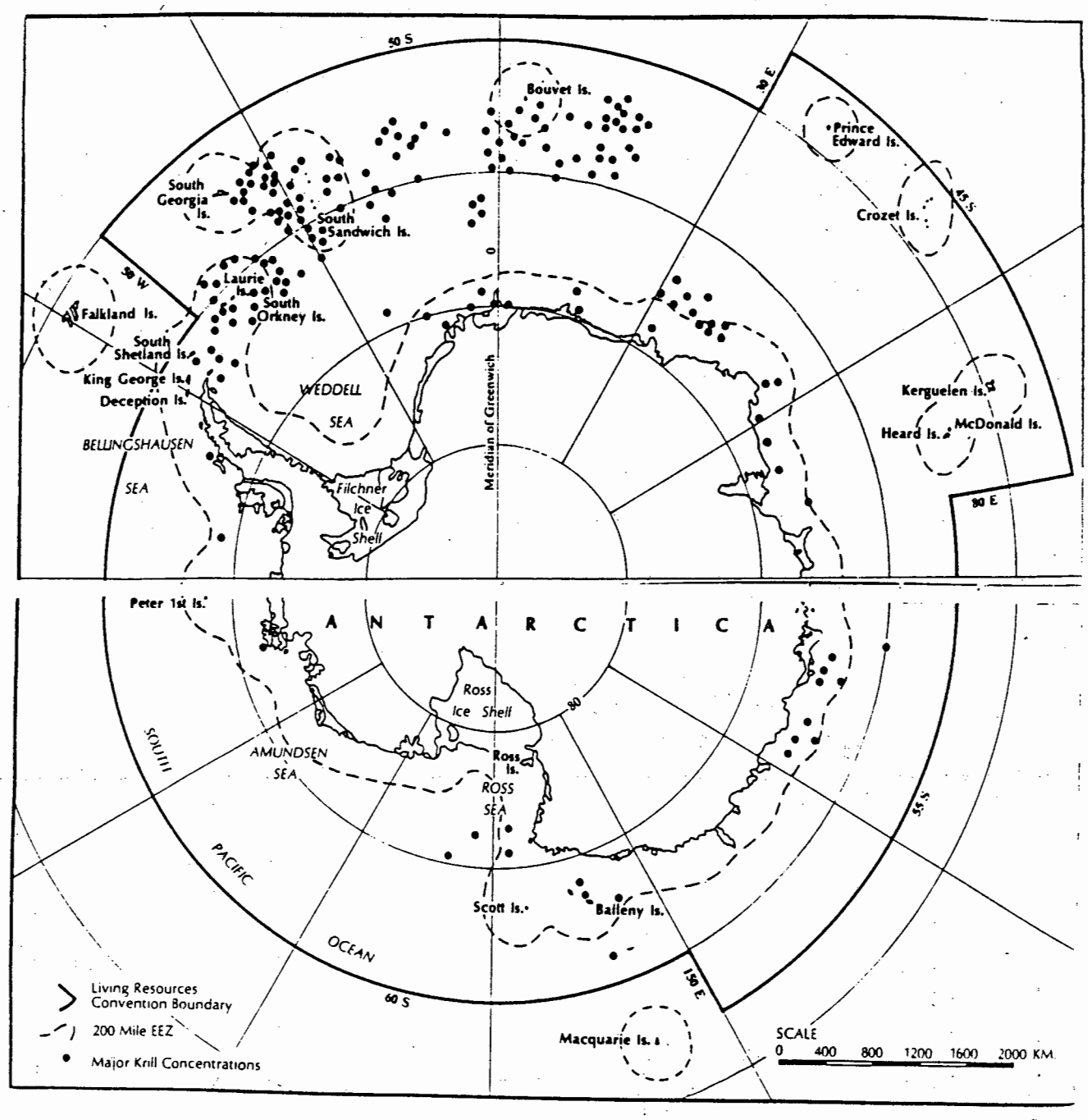

F. M. Auburn, Antarctic Law and Politics

CONTENTS

1. INTRODUCTION

As a result of man's quest for fresh sources of food, there has been ever-increasing speculation as to the possible exploitation of living marine resources found in Antarctic seas. Besides finfish, there appears to be great potential in krill fisheries. Krill are small, shrimp-like crustaceans which swarm in major concentrations in Antarctic waters. Estimates of krill fisheries vary considerably from standing stocks of 125 million metric tons to as much as 6 billion metric tons. It is anticipated that krill might some day furnish a super abundant new source of protein to meet the world's ever-increasing demand for food. However, owing to the perceived ecological importance of krill, there is growing concern as to possible future, large-scale exploitation of krill.(1)

The major living resources of Antarctic waters are considered to comprise whales, seals, birds, fish, krill and squid. The harvesting of seals during the last century and whales in the first half of this century led to serious depletion of their numbers (example fur seals), and in the case of some species resulted in near extinction (example the blue whale). However, despite the recovery of some exploited whale and seal populations (example fur seals at South Georgia and minke whale world-wide), there is still considerable concern as to their continued ecological well-being. The exploitation of fish around South

Georgia and Kerguelen islands has been heavy, whereas penguins have been relatively lightly exploited on some islands. Although little is known about squid, there may be some commercial potential and squid are currently heavily exploited in the vicinity of the Falkland islands, just north of the polar front.(2) This paper will deal with the legal developments surrounding the conservation and exploitation of off-shore living marine resources in the Antarctic.

Antarctica comprises 9% of the earth's land mass. It is larger than Europe, Australia and the United States, each taken separately. A thick layer of ice at an average of up to 2 km tall covers 99% of its surface. Antarctica accounts for 90% of the earth's ice and about 80% of terrestrial fresh water reserves. It is the coldest continent, with an average winter temperature of -60 degrees C, the tallest, with an average elevation of 2 500 meters, the driest, with average annual precipitation totalling only 10 cm and the windiest with the wind as the main obstacle to human activity. Antarctica is the source of weather in the southern hemisphere. Since the ice masses have depressed the land, it is surrounded by a relatively deep continental shelf between 400 and 800 meters below sea-level. It is an uninhabited continent except for approximately 1 000 scientists, who are substituted periodically, conducting research work.(3)

The International Geophysical Year in 1957/8 signified a turning point in international Antarctic co-operation that led to the signing of the Antarctic Treaty in 1959. The Treaty was originally signed by 12 countries (the 12 consultative parties) i.e. the seven countries that laid claim to various parts of the Antarctic (Argentina, Australia, Chile, France, New Zealand, Norway and the United Kingdom) and five non-claimants (Belgium, Japan, South Africa, the USA and the USSR). There are now 28 signatories of which 16 have consultative status (i.e. the 12 original signatories plus Poland, Germany, Brazil and India). The Treaty came into effect in 1961 and was concluded for an unlimited duration, subject to renewal from 1991. Potential sovereignty disputes were shelved, the legal position of signatory states have been kept in abeyance and new claims cannot be asserted for the duration of the Treaty. (4)

The explicit aim of the Treaty is the furtherance of the purposes and principles of the United Nations Charter. The more important objectives of the Treaty include the following : that the Antarctic should forever be used exclusively for peaceful purposes and not become the scene of international discord. It prohibits nuclear explosions and the disposal of nuclear waste, and any measures of a military nature. It guarantees freedom of scientific research throughout Antarctica and promotes exchange of information of all forms of scientific research work. It establishes a system of on-site inspection by observers to promote the objectives and ensure the observance of the Treaty.

The Treaty is aimed at ensuring the unspoilt character of the area south of 60 degrees South Latitude, including all ice shelves, but nothing in the Treaty shall prejudice or in any way affect the rights, or the exercise of the rights, of any state under international law with regard to the high seas within that area.[5]

Although the boundary of the Antarctic has been politically fixed as that region south of 60 degrees South Latitude, scientifically, a more appropriate demarcation line is the Antarctic Convergence (or Polar Front), a relatively narrow circumpolar zone caused by the northward flowing Antarctic cold surface water impinging upon the warmer, southern-moving sub-Antarctic surface waters.[6]

Since the Antarctic Treaty came into effect in 1961, it has undergone a progressive, expansionary evolution into a multilateral regional regime, often referred to as the Antarctic Treaty system.[7] The Antarctic regime system is comprised of six principal components :

1. The Antarctic Treaty, which is the centre piece of the arrangement.
2. The Convention for the Conservation of Antarctic Seals, which came into effect in 1978 ;
3. The Convention on the Conservation of Antarctic Living Marine Resources (CCAMLR), which came into effect in 1980 ;

4. The agreed measures for the Conservation of Antarctic Fauna and Flora, which came into effect in 1964 ;
5. The Evolving Antarctic Minerals Regime ; and
6. The Scientific Committee on Antarctic Research (SCAR).

The application of CCAMLR as far as the Antarctic Convergence/ Polar Front represents a considerable extension northwards from the boundary of the Antarctic Treaty area at 60 degrees south and is particularly important as many of the known concentrations of krill are situated between the convergence and 60 degree south. In practice however CCAMLR may not apply to all waters south of the convergence. Nations of the numerous islands between the convergence and 60 degrees south over which the existence of national sovereignty is undisputed (example the French island of Kerguelen and the Prince Edward islands of South Africa) have the right to exclude measures adopted by the commission established in terms of CCAMLR, if they so desire. (8)

The above framework is provided by conferences of the consultative states at which recommendations are made that become binding to those states. Any party to the Treaty which engages in major scientific research in the Antarctic is entitled to be a consultative party. Signatories such as China, Italy, Peru and Spain are presently aiming towards such status. The idea behind this scheme is, therefore, that those countries committed in substantial scientific research at a great expense should enjoy greater rights and responsibilities. At present therefore, effective

competence for the area is limited to states with a greater fund of knowledge and responsibility. The consultative countries to the Treaty have successfully managed Antarctica, ostensibly as a common heritage for the benefit of all mankind (Antarctic Treaty Preamble). However, their collective policies are only partly publicised, and long-term plans can only be subject to speculation since the members' meetings are held in secret. Thus it is said by Maarten J de Wit (9) that although scientific activity in Antarctica is effectively dictated by a monopoly on this continent, in reality the Treaty "club" shares executive power of Antarctic affairs by means of scientific colonialism.

As a further result of the quest for fresh sources of food, energy and raw materials, the Antarctic has recently commanded growing interest in the international community, especially by those countries outside the Treaty. Demonstrations of this interest have been reflected by various United Nations bodies such as the Food and Agriculture Organisation Committee on Fisheries. There has been widespread support by Third World countries that the Antarctic should be declared the "common heritage of all mankind". (10) This is the concept adopted by The Law of the Sea Convention. In the debate on the "Question of Antarctica" in the 1983 UN General Assembly it was the aim of Malaysia, supported by a number of Third World countries, to have the Antarctic Treaty replaced by a system of management under direct control of the United Nations.

The objective, therefore, is that the future of Antarctica and its resources should reflect the needs of all countries. This objective has also been the result of Third World concern that the Antarctic club may use the Treaty as an umbrella for making commercial arrangements to the advantage of its members. Suspicion of this has been raised over the past few years by discussions within the Treaty framework on the related issues of exploitation and conservation of mineral and living resources. However, Treaty parties have resisted any attempts to internationalise the Antarctic or to give the United Nations any control. They maintain that the Treaty provides the means for dealing with the special and unique problems of the Antarctic, particularly with regard to exploration and exploitation of resources. They claim this qualification, through their long historical association with and involvement in the Antarctic.(11) Furthermore, they can rely on CCAMLR and progress towards achieving some comparable objectives regarding mineral resources, to demonstrate the advantage of utilising specialised knowledge rather than comprehensive international solutions when dealing with isolated areas like the Antarctic.

Satisfaction and praise has been expressed by representatives of various world communities for the success of the Antarctic Treaty since its inception in 1961. There has been an almost perfect record of guardianship of Antarctica by the 12 founder-members and the four subsequently adopted members of the consultative circle of the Treaty. This long period of international scien-

tific co-operation and development in Antarctica, together with the peaceful management of Antarctic affairs, is a remarkable achievement when viewed against the background of the world's cold-war. "With hindsight, the conception, birth, and subsequent development of this Treaty has proved to be a major achievement of negotiation amongst a diverse group of nations with highly variable initial stakes and trumps".(12) Therefore, forces mobilised through the Treaty obligations have given the Antarctic Treaty "club" a unique flavour of successful international co-operation. However, the ultimate viability and strength of the Treaty is yet to be tested. The Treaty itself is silent on the issue of the economic utilisation of Antarctic resources.(13)

It is evident however that the "common heritage" principle has found favour in the United Nations. This was reaffirmed at the Non-Aligned Movement meeting in New Delhi (March 1983).(14)

It is accordingly possible that a new dispensation may develop which will allocate the resources of Antarctica on equitable principles, founded on the "common heritage" concept. However, this would deem it necessary for considerable concessions to be made by the original guardians of Antarctica. It is evident that Treaty "club" members have no intention of abandoning sovereignty or making any other concessions of a substantive nature. The whole question of sovereignty would again become a major issue. The sovereignty issue is so central to the whole debate that it will result in complicated legal questions that need to be

answered. The matter is further complicated in that there is no agreement amongst the nations of the world as to who owns the resources of Antarctica or can purport to exercise jurisdiction over its vast land mass. There is also a moral problem in that the Treaty "club" members believe that the majority of non-Antarctic Treaty nations at the UN discussions do not have the best interests of Antarctica at heart, and that these countries will, therefore, not comply with voluntary restraints of the kind which the present Antarctic guardians have nurtured for the needs and benefit of this continent. (15)

It is further argued by some that it is unfair that countries which make substantial contributions should make concessions to other non-committal countries. Some countries incur considerable monetary expenditure in respect of scientific activities in the Antarctic. The annual US Antarctic budget for instance is around 100 million US dollars. (16)

Finally, it is questioned whether peaceful co-operation on a scientific level can continue if the Treaty "club" is abandoned. Militarisation of the Antarctic is one fear that would then come to mind. Despite the Treaty, however, a number of major legal issues concerning the Antarctic remain unresolved. These issues include disputed claims of national sovereignty over various territories, the legal status of the waters surrounding the Antarctic, exploitation of mineral resources, relationships with non-Treaty parties, and comprehensive protection of the Antarctic

environment, especially its ecological balance. The environmental management in the Antarctic therefore needs to address the problems of protecting the Antarctic environment in general and more particularly, conserving the many marine ecosystems which are present in Antarctica. (17)

2. CLASSIFICATION

Four major species in the exploitation of Antarctic marine living resources can be identified ; seals, whales, finfish and krill. Regarding the direct exploitation of Antarctic living resources we are concerned only with the marine environment which has traditionally been a problem since the southern ocean is an area where productive continental shelf waters do not lie within an operating 200 mile EEZ (Exclusive Economic Zone), except around Kerguelen island, where the French authorities have imposed an EEZ. The southern ocean is therefore comparable to most of the waters over continental shelves in the pre-UNCLOS (United Nations Convention on the Law of the Sea) era. Much of the over-exploitation of the world's fish resources that occurred in the years before UNCLOS was as a direct result of this lack of ownership. Garret Hardin's theory of the "tragedy of the commons" is relevant in fisheries where, in the absence of control, new investment is attracted into a fishery until profitability is entirely dissipated and the resource depleted. Hardin basically concluded that : "Each man is locked into a system that compels him to increase his herd without limit - in a world that is limited. Ruin is the destination toward which all men rush, each pursuing his own interests in a society that believes in the freedom of the commons. Freedom in a commons brings ruin to all". (18)

The open access nature of the living marine resources of the Antarctic has accordingly been instrumental in leading to the depletion of different groups. This process started with seals in the 18th and 19th centuries and in recent decades the finfish have become the main target of gross over-exploitation. All the depletion of fish and seals occurred prior to any international management agreement. Whales were over-exploited in the 20th century and have until recently continued to be depleted under the management of the International Whaling Commission. There are presently three conventions that cover the marine living resources in the Antarctic : the International Whaling Convention (IWC), the Convention for the Conservation of Antarctic Seals (CCAS) and CCAMLR. These conventions are universally recognised as having appropriate jurisdiction in Antarctica, even though they are not formally part of the Antarctic Treaty. (19)

SEALS

The utilisation of seals as a resource has gone through a number of stages. The first species to receive attention were the fur seals, and to a lesser extent the elephant seals. The fur seals of Southern Africa, and Uruguay had been harvested for a long time but had been subject to some form of control by the local authorities. During the late 18th century and early 19th century, the islands in the southern ocean with fur seal colonies were discovered and their resources exploited. In the absence of

any local authority, exploitation was not controlled and seal stocks were often reduces to near extinction. The sub-Antarctic fur seals remained scarce for approximately 100 years until 1956 when colonies of thousands of fur seals were discovered at South Georgia. These numbers were still fewer than the original stocks, but a considerable advance from the handful existing earlier in the century. The South Georgia stock has subsequently increased at a steady rate, doubling every five years. There are now approximately one million animals which is probably close to the original numbers. There has also been a steady increase in numbers on other island groups. The dramatic rate of recovery considering that these animals had been on the brink of extinction, is extremely rapid for an animal that produces at most one young per year and does not mature until it is four to five years old. It is submitted that the high population growth rate may be due to an increased abundance of krill as a consequence of the depletion of whales.(20)

The Antarctic seal convention was promulgated in 1972, and came into effect in 1978, on ratification by 10 of the 12 original Antarctic Treaty consultative parties, with New Zealand and Australia being the exceptions.(21) The purpose of the convention is to limit the vulnerability of six species of Antarctic seals to commercial exploitation. CCAS is applicable to the region south of 60 degrees south and it regulates harvesting of crabeater, leopard and Weddell seals. CCAS also specifically forbids the killing or capture of Ross, southern elephant and southern

fur seals. Detailed measures concerning permissable catch, protected species, closed and open harvesting seasons, seal reserves, and exchange of information on sealing and harvesting methods are outlined in a separate Annex to the convention. CCAS does not however provide for national catch allocations and, as in other Antarctic matters, the Scientific Committee on Antarctic Research (SCAR) serves to provide scientific advice and co-ordinate the convention's implementation. Various other provisions allow for the periodic revue of CCAS and govern the issue of sealing permits and conditions for accession. Little or no commercial sealing has been carried out in the last 80 years, with the exception of a small annual take for dog food. However, reports of a harvest of approximately 40 thousand crab-eater seals in 1987/88 prompted states which are party to CCAS to conduct a review of its provisions. The review took place during September 1988 and the issues addressed included the provision of special permits, improved exchange of information, possible plans for commercial sealing, catch zones and avoidance of the accidental introduction of infectious disease, especially canine distemper. However, no major amendments to the operation of the convention were proposed. (22)

WHALES

There has been considerable over-exploitation of the larger baleen whales in the southern ocean. These whales have now been

protected by various decisions of the IWC and may be expected to recover slowly, although there is little direct evidence of such recovery to date.(23) Shore-based whaling began in 1904. By 1911 there were 8 active whaling stations on South Georgia alone. There were also 9 shore-based factory vessels and a single shore station operating at the south Shetland islands. Control of the whaling industry by the British Government ended in 1925 with the deployment of the first factory ship equipped with a stern-slip facility. Thereafter, all stages of the whaling operation which included citing, hunting, capture and processing, were carried out at sea. As a result, the whaling industry was effectively beyond the control of any regulatory authority.(24)

Exploitation of the larger, more commercially desireable whale species (i.e. the blue, fin, sei and humpback whales) was particularly rapid and intensive, and there was a considerable decline in population sizes. Such declines probably induced a marked shift in the ecological balance between baleen whales and other predators of krill, especially seals. Although no species of whale has been completely exterminated, there is still no concrete evidence for any substantive recovery, despite the stringent measures having been applied by the IWC.(25)

The minke whale alone, currently still exhibits potential for exploitation, although commercial harvesting of the minke whale has been restricted since 1980 and further limited since 1985/86 to a minimal catch for scientific purposes only. The minke whale has

in recent years been harvested by Japanese and Soviet fleets, who operate under the objection procedure of the IWC. Current harvest levels are however small compared to the estimated stock size and dramatic depletion of the minke whale is unlikely. The exploitation of all other whales in the Antarctic has been effectively prohibited by the IWC since 1980. (26)

The IWC, including founder-member South Africa voted at its 1982 meeting to introduce an indefinite moratorium on commercial whaling. At that time it was obvious even to casual observers that stocks of most great whale species had crashed dramatically after excessive hunting. The IWC decided it lacked proper data on the risks attached to further commercial whaling and that the ban should remain until its scientific committee could come up with sound recommendations, including catch limits. As a result of opposition from traditional whaling countries such as Norway, Iceland and Japan, the ban became effective only in 1988, but since then thousands of minke whales have still been killed under the guise of scientific investigation. In a statement on the eve of the IWC's annual meeting in Glasgow in 1992, the World-Wide Fund for nature (WWF) criticised proposals by Norway to kill 110 minke whales during the 1992 season and 136 during each of the following two years as "obviously commercial figures rather than essential research". (27)

Now the IWC's scientific committee has produced a revised management strategy which, it argues, will provide adequate safeguards

against uncontrolled exploitation. It is a strategy in other words which allows for the rational, sustainable exploitation of whales.[28] In 1992, Japan proposed continuing its "research" by killing minke whales in the Antarctic again that year. Japan's argument at IWC meetings was that the minke whale populations in Antarctica "are so robust that there is nothing wrong with commencing commercial whaling on them".[29] Clearly these circumstances should be closely monitored to prevent over exploitation of whales and to ensure compliance with the moratorium.

FINFISH

The fish resources of the Antarctic are limited, being largely confined to small areas of shelf surrounding the island groups, particularly at South Georgia in the Atlantic sector and Kerguelen in the Indian ocean sector, and the Antarctic peninsula. None of the stocks seem able to sustain long periods of heavy exploitation, and the historical trend of the fisheries is one of short periods of heavy fishing of one stock, followed by a shift to another stock. The most notable, and also the earliest, example of this depletion tendency is the fishery for notothenia rossii at South Georgia. Whereas in the 1967/70 and 1970/71 seasons, half a million tons were taken from this stock, in the next 12 seasons, a total of less than 60 thousand tons were reported as being caught. These variations from stock-to-stock resulted in considerable variations in total annual catch especially since in

some years many of the fleets did not visit the Antarctic. The productivity of the fish stocks is probably not high enough to enable high-sustained catches to be taken, regardless of the management regime. Although the French authorities have introduced controls on the number of trawlers operating and the catches taken around Kerguelen island, which allows for a more regular level of catch than in areas where no coastal state control has been introduced, the total catch is still small. (30)

The total fishing effort deployed in the Atlantic sector increased after 1975/76 and the fishery expanded its area of operation into the region of the South Orkneys in 1977/78. There was subsequently a rapid increase in the quantity of fish taken in the Atlantic sector which was predominantly made up of large catches of the Antarctic ice fish in 1976/77 and 1977/78. Other common species, such as the Patagonian rockcod, the Humped rockcod, the South Georgia ice fish, the Scotia Sea ice fish and the Spiny ice fish have, from time to time, been caught in considerabe quantities either locally or as regular by-catches. In 1978/79, the fin fishery was further extended to the South Shetland and Joinville islands. (31)

Catches in the Atlantic sector have declined steadily during the 1980's and, in the 1989/90 season, the total catch of all species in this area was only $4,0 \times 10^{4}$ tons. By 1989/90, approximately $2,0 \times 10^{6}$ tons of finfish had been taken from this area, more than 90% by the Soviet Union. Until 1981/82, bottom trawling (to

depths of approximately 500 meters) was generally the only fishing method used. In 1988/89, the Soviet Union initiated a long-line fishery for the high quality Patagonian toothfish in the vicinity of South Georgia. During 1988/89, the Soviet Union also commenced exploratory fishing for the myctophid Electrona carlsbergi in the polar frontal zone north of South Georgia and catches in the two seasons 1988/89 and 1989/90 were approximately 30 thousand tons. (32)

After several exploratory surveys by the Soviet Union between 1958 and 1961, finfish exploitation in the southern Indian ocean commenced at Kerguelen island during 1967/68. Although only vague reports of catches were forthcoming until 1978, such reports improved with the declaration of an Exclusive Economic Zone (EEZ) around each of the French-controlled sub-Antarctic islands (Crozet, Kerguelen, St Paul and Amsterdam) in 1978. There has however been a notable decline in catches of virtually all species since 1979/80. During the 1980's, a small fishery has also been carried out at Ob and Lena seamounts in the Indian ocean sector. Reported catches from these two seamounts have generally been unreliable and small although significant catches (up to 9 x 10^3 tons in 1985/86) of N. squamifrons have been reported. Recent reports however indicate that cathes of N. squamifrons have been sporadic, with a decline at Ob since 1986 and an increase at Lena from 1987/88 to 1988/89. (33)

KRILL

At present, however, the resource receiving the most attention is the shrimp-like krill. Krill derives its etymology from a Norwegian word meaning whale food. Euphasia superba is the most significant species of krill. The various species of krill, which are small shrimp-like crustaceans, form the major part of the zooplankton of the southern ocean and a major part of the diet of several whale, seal, fish, squid and bird species. (34)

Krill is the backbone of the Antarctic ecosystem. Experimental krill fishing began in the 1960's. Annual catches grew to approximately 200 thousand tons in the mid 1970's and further estimates were that if technical and marketing problems could be solved, krill might sustain an annual yield of up to 150 million tons. Serious technical problems have arisen regarding processing and detecting krill. Although the aforesaid estimates have not materialised, the possible annual harvest of krill has been estimated to be between 70 to 105 million tons, although this estimation does not account for the amount that could be safely harvested without damaging the overall krill stock, as well as the other forms of marine life that depend directly upon krill. Nevertheless, compared to the total world marine fish catch which is approximately 60 to 70 million tons annually, it is evident that the potential contribution that krill would make to a hungry world is substantial. (35)

Krill have accordingly received most of the attention since there seems to be a vast sustainable supply ; they contain the same percentage of protein by weight as beefsteak, and they have potential for use in a variety of high-protein food products or even as food aid to developing countries. The products and markets for krill include whole frozen krill and tail meats (much like shrimp), krill mince, paste, and meal, krill soup and krill beer. Other reasons for the recent attention to krill are the dwindling supply of fish levels in traditional fisheries, the restrictive extension of coastal zones by many states, the increasing demand for protein resources, and the considerable improvements in fishing technology regarding detection, harvesting, and processing of krill. (36)

Since krill swarm in large schools close to the surface, capture by trawling is relatively easy. However, the distribution of krill about Antarctica is extremely uneven, resulting in discrepancies in the estimates of the total krill biomass. Estimates on the total krill biomass in the southern ocean range from a US estimate of between 200 and 600 million metric tons to a Soviet estimate of 1,96 billion metric tons! (37) Other problems exacerbated by the uneven distribution of krill have been experienced in most new fisheries, example inadequate data regarding the quantities, relationships, and life cycles of the target species; density-dependant characteristics of the species regarding the affects of substantial harvesting; an unknown recruitment curve; and possible cyclic variation in the prey-predator curve. (38) The

largest concentrations of krill appear to be in the Atlantic sector, which is adjacent to the region claimed by both Argentina and the United Kingdom.(39)

The following factors render the Antarctic marine ecosystem particularly vulnerable to krill exploitation :

1. The ecosystem is characterised by short, simple food chains.
2. Many intermediate and higher trophic level species are dependant upon krill alone and the ecosystem has little chance for diversification or substitution of food sources.
3. Several higher trophic level species have relatively slow growth rates.
4. The recovery of protected whale and seal species will be inhibited if krill is over-exploited.
5. The danger of local pollution from maritime accidents is a realistic one.
6. Krill spoil within about four hours once removed from the icy southern ocean, therefore krill must be harvested continuously with processing facilities nearby.
7. Whales feed on krill at the same times and in the same longitudes as are most practicable for human harvesting of krill.

In view of the above and the crucial importance of krill in the southern ocean ecosystem, great care must be exercised in the management of krill and of dependant and associated species.(40)

3. COASTAL STATE JURISDICTION : TERRITORIAL SOVEREIGNTY : THE "BIFOCAL" APPROACH

The first country to lay claim to Antarctic territory was the United Kingdom in 1908 which claimed the area between 80 degrees W and 20 degrees W. The 6 other states which have subsequently staked formal claims to sections of Antarctica are : New Zealand (160 degrees E to 150 degrees W), France (136 degrees E to 142 degrees E), and Argentina (74 degrees W to 25 degrees W) in the 1920's, Australia (45 degrees E to 136 degrees E and 142 degrees E to 160 degrees E) and Norway (20 degrees W to 45 degrees E) in the 1930's, and Chile (90 degrees W to 53 degrees W) in 1940. It is apparent that the claims of Chile, Argentina, and the United Kingdom overlap, and are hotly disputed, as are claims to sovereignty by these states over certain islands.(41) Prior to the signing of the Antarctic Treaty, both Chile and Argentina had claimed a territorial sea extending from their land claims and Argentina also pronounced sovereignty over the adjacent continental shelf. Other interested states, however, more particularly Japan, the United States and Russia have constantly refused to recognise any claims to sovereignty in Antarctica. The American station in Antarctica lies partly in every sector, while Russia has erected stations in every sector besides that sector claimed by France and including the unclaimed sector between 150 degrees W and 90 degrees W. The dispute amongst Argentina, Chile, and the United Kingdom was left unresolved in the international court

of justice case in 1956.(42)

Although in terms of article iv of the Antarctic Treaty, the status of claims has been "frozen" and the views of non-claimant states preserved, the underlying uneasiness regarding the jurisdictional issue and its threat to the Treaty system is exacerbated by the imminence of resource development.(43) It is worth quoting article iv of the Antarctic Treaty which provides as follows :

1. "Nothing contained in the present Treaty shall be interpreted as :

   (a) A renunciation by any consulting party of previously asserted rights of or claims to territorial sovereignty in Antarctica ;

   (b) A renunciation or diminution by any contracting party of any basis of claim to territorial sovereignty in Antarctica which it may have whether as a result of its activities or those of its nationals in Antarctica, or otherwise ;

   (c) Prejudicing the position of any contracting party as regards its recognition or non-recognition of any other state's right of or claim or basis of claim to territorial sovereignty in Antarctica.

2. No acts or activities taking place while the present Treaty is in force shall constitute a basis for asserting, supporting or denying a claim to territorial sovereignty in Antarc-

> tica or create any rights of sovereignty in Antarctica. No new claim, or enlargement of an existing claim, to territorial sovereignty in Antarctica shall be asserted while the present Treaty is in force."

It is evident therefore that the Treaty maintains the status quo regarding sovereignty.(44) This is further discussed at pages 27 and 28 below.

The above solution contained in article iv presented few problems until the discovery of the potential for exploitation of krill and, possibly, oil and gas in Antarctic waters, and minerals on the continent.(45) Further complicating this difficult issue during the Antarctic Treaty convention negotiations, was the existence of other sources of law which are presumably operative in the southern ocean besides the Antarctic Treaty. These non-Treaty sources of law involve rights extending from the Antarctic continent, rights extending from islands south of 60 degrees south, rights extending from islands north of 60 degrees south, rights of states on the high seas, and potential rights of states devolving from emerging principles of international law. The essence of most of these non-Treaty bases of law may be derived from the Law of the Sea Convention (LOSC) and its concept of coastal state jurisdiction and Exclusive Economic Zones (EEZ's).(46)

There was accordingly a general acceptance as customary international law, in line with the emerging LOSC, of the rights of

coastal states to exercise jurisdiction over 200 mile exclusive economic zones, measured from the base lines of the coastal states. Naturally, the possibility of being able to exploit resources within 200 miles of the coast lines of the coastal states was of great importance to claimant states in Antarctica, particularly in view of the fact that the resources might include valuable minerals and huge fish stocks. (47)

It is argued by most that there ought to be no EEZ's extending from the Antarctic continent and that most of the southern ocean ought to be considered as high seas. Regarding coastal zones generated by Antarctic islands, however, there is a general acceptance by all interested parties that islands north of 60 degrees south and thus not subject to article iv of the Antarctic Treaty, would be entitled to whatever rights might be asserted under international law. Islands south of 60 degrees south accordingly create most of the problems and claimant states are unlikely to surrender perceived maritime rights generated from the continent. It was further felt by states claiming rights to Antarctic territorial or insular sovereignty that a failure to assert authority over resources in the maritime zones adjacent to their claims would be perceived as a weakening of the validity of their claims. (48)

On the other hand, non-claimant states could not concede anything with regard to coastal-state jurisdiction for fear of compromising their own positions as most of the marine living resources

and probably most of the hydrocarbon resources of the Antarctic region are located within 200 miles of the coastline of the continent or Antarctic islands. All interested parties further wish to ensure that the living resources regime does not jeopardise potential hydrocarbon and mineral rights. On a global scale, the ocean space within 200 miles of the states of the world contains more than one third of the earth's seas, more than one half of the marine living resources, and probably an even greater portion of the mineral resources of the sea and seabed. Therefore, the valid exercise of coastal zone jurisdiction in the southern ocean would subject the natural resources of most of the Antarctic region to contested national, as opposed to co-operative control of the Antarctic Treaty members. It is noted that the areas of the southern ocean with the greatest concentration of marine living resources and the greatest potential for under sea petroleum reserves extend from the sector of Antarctica claimed by Argentina, Chile, and the United Kingdom. (49)

In view of the above framework, the conferees at the negotiations for the Antarctic Treaty convention refused to make decisions regarding the setting of national harvesting quotas since any basis for deciding on national catch limitations or "coastal-state" fishery zones, a traditional scale of harvesting, would create disharmony. The result, as previously mentioned, was that the issue of coastal-state jurisdiction was frozen. (50)

A further issue regarding coastal-state jurisdiction, which was

of concern particularly to France, was that the Kerguelen and Crozet islands over which France asserted undisputed sovereignty, might be deprived of 200 mile zones by the forthcoming Antarctic Treaty regime. France desired that either the area of application of the convention specifically exclude these islands which are situated north of the Treaty area, alternatively that the convention expressly include a provision that the right to extend 200 mile zones from these islands be preserved. This issue raised important consequences for the scope of the convention, the feasibility of implementing the conservation standard, and the participation in the convention of states with sovereignty over islands north of 60 degrees south.(51) It is further noted that the issue is the same whether sovereignty over such islands is undisputed or not. For instance, with regard to the south Orkney islands in the Antarctic, over which 2 states dispute sovereignty, the island itself could still generate a 200 mile zone, leaving the enjoyment of benefits from such a zone to a bilateral agreement between the 2 states. Regarding undisputed island sovereignty, Australia and France would expect that their Antarctic islands would generate some sort of maritime zone. On 4 January 1982, Australia and France in fact signed an agreement providing for the maritime boundary between Heard and McDonald islands, and Kerguelen.(52)

In general, claimant states maintain that they own the resources in their sectors, while non-claimant states argue that freedom of access exists to the resources of the continent, a notion similar

to freedom of access to the entire continent for purposes of scientific research under the Treaty. To this end, the United States is the most vigorous proponent of the so-called "open-door" policy. However, this position is strongly contested by the Latin American claimant states as well as Australia.(53) Furthermore, in terms of existing international law, no nation can clearly establish the legitimacy of its Antarctic claim. This is a significant factor in precluding the determination of natural resource jurisdiction for the whole region, including its outlying areas.(54)

The conferees at the convention finally decided to sidestep the sovereignty issue, adopting a so-called "bifocal" approach which permitted all interested states to participate in the convention. It is evident that the provisions of article iv of the Antarctic Treaty give rise to the bifocal approach, an approach which allows claimants and non-claimants to interpret the same language differently. According to the claimant states, which interpret these provisions as referring to all land territory in the Antarctic region, the right to assert a coastal zone from the continent has been preserved, and such an assertion is not an enlargement of an existing claim but rather a recognition of a latent but inherent right to territorial sovereignty. Non-claimant states on the other hand interpret these provisions as permitting coastal zones to be drawn from islands north of 60 degrees south but proscribing any such assertions from islands south of 60 de-

grees south or from the continent. From a conservationist point of view, it is hoped that neither claimants nor non-claimants will take assertive action regarding coastal state jurisdiction, since such action would undermine the force of the convention.(55)

From a legal point of view, resource plans or regulations in a convention devised by the consultative parties will have no binding effect upon non-signatories. There is accordingly no legal barrier preventing a non-Treaty nation for example from harvesting krill. The convention as a whole does little to accommodate nor promote the interests of developing countries, and as a result, given the scenario in which a non-Treaty party undertakes exploitation of a particular resource in a manner that runs contrary to conservation standards set down by the parties, the likelihood for regional conflict would appear considerable.(56) In spite of the fears of the conservationists and the interpretation difficulties that may arise from the bifocal approach, some argue that the significant fact remains that the convention has managed, first to accommodate the divergent positions of the various countries engaged in the Antarctic Treaty and thereby, second, to resolve definitively the question of the maritime extension of the Antarctic Treaty system.(57)

The jurisdictional difficulties discussed above have led to various models being proposed for resolving how the respective resource regimes are to be organised. One commentator has accordingly suggested varying models based on national

considerations, open exploitation of resources, condominium, trusteeship or the common heritage of mankind. Another commentator has argued that with respect to the continental margin, a national, co-operative or international approach ought to be considered.(38) Compared to the law of the seas which has historically been closely linked with the development of respective Antarctic resource regimes, the normal rules of international law are difficult to apply to Antarctica. The different maritime zones, including the territorial sea, the exclusive economic zone and the continental shelf are not unknown doctrines in the Antarctic but they are applied within the framework provided by the Antarctic resource regimes, which is a contextual setting which differs from the traditional framework of conceptial application. There is accordingly an inevitable confrontation between legal norms and the possibility of their full application in the Antarctic case.(59)

Since the resources regimes in the Antarctic have necessarily involved some exercise of shared and internationally regulated and administered competences, the jurisdiction over Antarctic maritime areas has developed in a collective manner whereby it tends to be exercised jointly by the consultative parties, or by other countries participating in the regimes who act either through the machinery of the consultative meetings or through that of the specific resource regimes. Although the exercise of joint jurisdiction may be difficult, it is argued that it enjoys the advantage of providing a new approach to accommodate inter-

ests within the Antarctic Treaty system, an approach which so far has been reasonably successful.(60) Accordingly, the application of the law of the sea concepts to Antarctica, which are safeguarded by article iv of the Antarctic Treaty, cannot be overlooked, and furthermore, the exercise of coastal state jurisdiction has been reconciled with the necessities of joint co-operation particularly within the context of the aforementioned regimes.(61)

The claimant states, accepting the limitation on their claims to coastal-state jurisdiction in favour of the joint exercise of jurisdiction, have accordingly reached agreement with the non-claimant states to accept these joint regimes, thereby integrating the respective positions regarding the issue of maritime jurisdiction within such regimes. The above approach has made a significant contribution towards avoiding a potentially conflictive situation. The principal remaining problem is that of residual rights, since the claimant states maintain that everything not included in the common regime should come under the jurisdiction of the coastal state, whereas those states that do not recognise claims argue in favour of applying freedom of the high seas. However, the policy of restraint has prevented this problem from arising thus far in Antarctica. The joint jurisdiction approach further provides a basis for dealing adequately with the peculiar case of the unclaimed sector where, although no applicable national jurisdiction exists, a form of jurisdictional approach is evident with the creation of the Antarctic resource

regimes. Furthermore, the joint jurisdiction approach has been significant not only for the consultative parties and other parties participating in the respective regimes, but also for third states as evidenced where pertinent Antarctic Treaty or other arrangements have constituted objective regimes, or have created specific implications for such states through customary law and international legal relations arising from the Antarctic Treaty system.(62)

4. THE EMERGENCE OF THE CONVENTION ON THE CONSERVATION OF ANTARCTIC MARINE LIVING RESOURCES (CCAMLR) : THE CONSERVATION APPROACH

The Antarctic Treaty does not specifically deal with the exploitation, ownership or management of living or non-living resources, although it does authorise the 12 consultative parties to recommend measures with respect to the "preservation and conservation of living resources in Antarctica".(63) The consultative parties initially exercised this authority and adopted several conservation measures in the early 1960's. However, when Japan and the Soviet Union began fishing for krill (euphausia superpa) in the late 1960's and the early 1970's, the consultative parties decided to develop a legal regime to control the emerging fishery.(64) After negotiations for such a regime began in the early 1970's, CCAMLR was concluded in Canberra in May 1980. The 12 original consultative parties to the Antarctic Treaty, together with the German Democratic Republic, the Federal Republic of Germany and Poland signed CCAMLR which came into force on 7 April 1982. There are currently 18 parties to the convention, consisting of the 15 signatories plus Spain, Sweden and the European economic community.(65)

The main objective of CCAMLR is "the conservation of Antarctic marine living resources".(66) Article ii (3) states that the term "conservation" includes "rational use" for the purposes of

CCAMLR. The convention established a commission which meets annually and is responsible for adopting the necessary measures to implement the main objectives of CCAMLR. It also established a scientific committee as a consultative body which is responsible for providing the commission with scientific advice. The commission and the scientific committee are dealt with in more detail below.

Since a major Antarctic fishery had not emerged by the time the convention was signed in 1980, CCAMLR is particularly noteworthy in that it is one of the few international Treaties concerned with wild life conservation to be concluded prior to heavy commercial pressure on the species it was designed to protect. Another such Treaty with a similar effect is the Convention for the Conservation of Antarctic Seals (CCAS). This is significant since experience with whaling and fishing industries throughout the world has shown how difficult it is to conserve a living resource (i.e. to ensure that the exploitation of the resource is sustainable) once the industry has become over-capitalised and over-exploitation has become common. (67) The scenario was accordingly created to manage Antarctic marine living resources wisely from the time that CCAMLR came into effect.

A further hallmark of CCAMLR is the obligation upon its parties to adopt an "ecosystem approach" to the exploitation of Antarctic marine living resources. The effect of this approach is that when for instance the commission sets catch limits on krill fishing,

it must not only consider the impact on krill populations but also the impact on populations of other animals such as whales and penguins, which depend upon krill for food. Other fisheries Treaties have traditionally only been concerned with the stock being fished when setting harvest levels. Should the ecosystem approach be strictly applied, the effect should be much lower harvest levels than would result from the traditional approach since substantial krill harvesting may affect the recovery of the already depleted populations of large baleen whales in Antarctica.(68) The commission has however been very slow to implement catch limites. There have in fact been no agreed catch limits, not even interim catch limits, until 1992 when a precautionary catch limit on krill was implemented in the Atlantic sector. The effect of the commission's tardiness in this regard was that any state, whether or not a party to CCAMLR has been at liberty to take as much fish as possible throughout almost the entire convention area, not withstanding the conservation objective of the convention and not withstanding the legal duty imposed on parties to adopt an ecosystem approach to the harvesting of living resources within the area.(69)

Regarding the background of CCAMLR, it is interesting to note that the negotiators of the convention were primarily concerned about krill, the protein-rich shrimp-like crustacean which is the central link in the Antarctic marine food chain.(70)

The consultative parties to the Antarctic Treaty, aware that

human over-exploitation was responsible for the near extinction of southern fur seals in the 19th century and for the drastic depletion of Antarctic stocks of blue fin, right and hump back whales in this century, were accordingly anxious to prevent over-harvesting of krill. The main concern was for the krill itself as well as the effects that over-harvesting of krill might have on other species, particularly whales, which depend upon krill for food. The concern for the Antarctic ecosystem as a whole, is accordingly reflected in the preamble to CCAMLR which acknowledges the increased interest in the possibilities offered by the utilisation of krill as a source of protein as well as the importance of protecting the integrity of the ecosystem of the seas surrounding Antarctica. (71)

The conservation approach implicit in CCAMLR is a further hallmark of the convention. The traditional objective of most international fisheries agreements is to achieve the maximum sustainable yield of the stock being fished. CCAMLR not only stipulates that harvesting shall be geared to prevent populations of target species from decreasing below their level of maximum sustainable yield but also that equal regard shall be had to the likely effects of proposed harvest levels on non-target species and on the marine ecosystem as a whole. (72) Article ii (3) which embodies the "ecosystem approach" states as follows:

"Any harvesting and associated activities in the area to which this convention applies shall be conducted in accordance with the provisions of this convention and with the following principles

of conservation :

(a) Prevention of decrease in the size of any harvested population to levels below those which ensure its stable recruitment. For this purpose its size should not be allowed to fall below a level close to that which ensures the greatest nett annual increment ;

(b) Maintenance of the ecological relationships between harvested, dependant and related populations of Antarctic marine living resources and the restoration of depleted populations to the levels defined in sub-paragraph (a) above ;

(c) Prevention of changes or minimisation of the risk of changes in the marine ecosystem which are not potentially reverseable over two or three decades, taking into account the state of available knowledge of the direct and indirect impact of harvesting, the effect of the introduction of alien species, the effects of associated activities on the marine ecosystem and of the effects of environmental changes, with the aim of making possible the sustained conservation of Antarctic marine living resources." (73)

Article ii (3) (a) means that the level below which a harvested population shall not be allowed to fall is essentially its level of maximum sustainable yield. Articles ii (3) (b) and ii (3) (c) give effect to the "ecosystem approach", article ii (3) (b) being particularly significant with regard to the depleted populations of large baleen whales south of the Antarctic convergence. The

further objective ofcourse is that krill may not be harvested at a level which would impede the recovery of these depleted populations.(74)

As previously mentioned, the term "conservation" as used in CCAMLR means the "rational use" of the resources. The term "rational use" is in turn intepreted according to the corporate philosophy of the mainly ecologically trained scientists who advised the Antarctic legal system. The aforesaid philosophy is firmly engrained in the specific provisions, or principles of conservation, implicit in CCAMLR. The basic proposition of the philosophy is that exploitation of living resources should occur at levels of sustainable yield, which means that populations should not be exploited to levels below those which would ensure stable recruitment. This philosophy is often extended by conservationists to the field of economics, with the argument that it is basic economic sense to live off the income of natural resources, rather than to consume the capital.(75) This proposition is contained in biologist Garret Hardin's theory of the "tragedy of the commons" which was expounded in 1968, just as the current law of the sea negotiations were getting under way at the United Nations.(76) However, this theory may often not appear to be basic economic sense to the exploiter who by depleting a resource more rapidly may make a bigger profit for investing elsewhere in other high-dividend yielding enterprises. This would make sound economic sense, particularly in relation to the large amounts of capital that need to be invested in order to be

able to exploit Antarctic resources. To date, the Antarctic legal system, apart from the developing "minerals regime", has not properly addressed the conflict between that which is ecologically and that which is economically desirable in defining the "rational use" of natural resources. (77)

The exploitation of krill and fish is presently CCAMLR's principal concern, since, they are the only Antarctic living resources which are being exploited on a relatively large scale at present. Regarding krill and fish therefore the problems for CCAMLR is how to regulate the take of the depleted fish populations so as to encourage recoveries of these populations for future fishing on a sustainable basis, and how to regulate krill fishing so that significant changes do not occur in the Antarctic marine ecosystem. Although the present take of krill is relatively small compared to the overall size of the stock, such a small take could nevertheless affect certain populations of whales and other predators on krill if the fishing is concentrated locally. Successful management for the "rational use" of living resources requires adequate knowledge regarding the behaviour of the resources and their exploiters and effective enforcement of a regulatory system for the behaviour of the exploiters. At present there is insufficient knowledge regarding the demographic status and dynamic behaviour of Antarctic krill and fish. There is also inadequate information regarding the catches and behaviour of the exploiters. There is accordingly an urgent need for comprehensive scientific studies of the above matters. (78)

5. THE COMMISSION AND THE SCIENTIFIC COMMITTEE

CCAMLR has established a commission with extensive powers to give effect to the objective and principles of the convention. In terms of article xiii (2) the commission must meet at least once a year but extra-ordinary meetings of the commission may be held at the written request of one third of its members.(79) Article xvii provides for the establishment of a secretariat(80) to serve the commission. The commission further has a scientific committee and permanent head quarters in Hobart, Tasmania(81) in order to assist in its tasks. In terms of article xiii (6) the commission is authorised to establish any subsidiary bodies that are necessary for the performance of its functions.(82)

In terms of article ix (1) of CCAMLR, it is the function of the commission to give effect to the objective and principles as set out in article ii of the convention (the conservation standard).(83) It is submitted that article ii imposes a legal obligation on parties to conserve Antarctic marine living resources and to adopt an ecosystem approach to any exploitation.(84) It is accordingly the commission's legal duty to take the necessary action in adopting an ecosystem approach to conserve Antarctic marine living resources. Should for instance scientific evidence suggest that harvesting krill, albeit small levels, in certain critical areas could impede the recovery of populations of baleen whales, the commission will be legally obliged to prohibit har-

vesting in those areas.[85] In terms of article ix (1) the commission shall give effect to certain specific activities, including research, compilation and analysis of data, implementation of a system of observation and inspection, and the formulation of conservation measures on the basis of the best scientific evidence available.[86] Article ix (1) further authorises the commission to "carry out such other activities as are necessary to fulfil the objective of this convention".[87]

Article ix (2) states that the conservation measures to be taken by the commission shall include, but are not limited to, designation of catch limits for harvested species, designation of protected species, designation of open and closed seasons, and designation of protected areas. The said article further provides for the "regulation of the effort employed and methods of harvesting, including fishing gear, with a view, inter alia, to avoiding undue concentration of harvesting in any region or sub-region".[88] This provision could be particularly useful in preventing over-exploitation of the swarms of krill which tend to form in the Antarctic summer. Article ix (3) obliges the commission to publish and maintain a record of all conservation measures in force,[89] and to notify all members of the commission of these measures.[90] In terms of article ix (6) (b) conservation measures become binding upon all members of the commission after 180 days from the time of notification. CCAMLR, however, similar to many treaties concerned with the conservation of wild-

life, contains a procedure whereby individual members of the commission may avoid being bound by specific measures to which they object. The objecting member must then inform the commission within 90 days of being notified of the measure that it is unable to accept it. Any other member then has the right to convene the commission to review the measure and within 30 days of such meeting any other member also has the right to notify the commission that it is no longer able to accept the measure. (91)

The scientific committee is established in terms of article xiv and is an advisory body to the commission. The commission is authorised to direct the scientific committee to conduct such activities as it considers appropriate. The committee however has certain mandatory functions under CCAMLR including obligations to assess the status and trends of populations of Antarctic marine living resources, to analyse data concerning the direct and indirect effects of harvesting on these populations and to make recommendations to the commission with respect to conservation measures and research that are necessary to implement the objective of the convention. (92) In terms of article xiv (3) the committee may seek the advice of other scientists and experts as may be required on an ad hoc basis. Article xxiii (3) specifically requires the commission and the committee to seek to develop co-operative working relationships as appropriate, with inter-governmental and non-governmental organisations which could contribute to their work including SCAR, the Scientific Committee

on Ocean Research (SCOR) and the International Whaling Commission (IWC).

Since the convention establishes an "ecosystem approach" to conservation and relatively little is known about the Antarctic marine ecosystem, the work of a scientific committee is crucial in maintaining the aforesaid conservation objective. Clearly the effectiveness of the scientific committee depends on its relationship with the commission. The negotiators wished to avoid the committee being a mere pawn of the commission, which is essentially a political body. The danger would then be that "politically inconvenient" data might be excluded from the consideration of the committee or the committee might make recommendations that are politically acceptable to the commission but not scientifically advisable.(93) Such a scenario could result in increased exploitation in the short term accompanied by overcapitalisation of the fishing industry, which could make rational use difficult to implement in the long term. The negotiators were equally concerned on the other hand that the scientific committee not be given too much independence. In the final draft of CCAMLR, the commission controls the committee's budget, and requires the committee to conduct such activities as the commission may direct. The commission is furthermore permitted to take such action as it deems appropriate notwithstanding any scientific advice it has received.(94) In terms of article ix (4) the commission is required to take full account of the recommendations and advice of the scientific committee, and the reports of the com-

mittee must furthermore be published.[95] The above framework maintains a close and credible relationship between the commission and the committee.[96]

A matter of concern however is that there have to date been ten meetings of the commission and its scientific committee and, apart from the recent precautionary catch limit on krill in the Atlantic sector, no regulatory measures have yet been adopted for the krill fishery although it is conceded that the krill issue has often featured in the discussions of both bodies.[97] This is particularly disappointing says Nicol[98] as the prime motivation for the negotiation of CCAMLR was to establish some form of regulation for the harvesting of krill and other Antarctic fisheries. It is even more surprising that in view of the objectives of the convention, it was not until its eighth meeting that any regulatory measure for krill was put forward, and only at the ninth meeting did any regulatory measure appear on the commission's agenda. It appears therefore that the commission and scientific committee have ignored, according to Nicol,[99] the basic issue that underpins the convention i.e. the management of the krill fishery.

Nicol further argues that the view that the convention came into force when there was no significant fishing pressure on the krill resource is a misconception, and that the krill fishery is anything but a small developing fishery. When the convention was ratified in 1980, the krill catch was 424 821 tons making it the

world's 24th largest fishery and the biggest crustacean fishery in the world. This fishery constituted 13,5% of the world's marine crustacean catch by weight, and 80% of the total fisheries catch in the southern ocean. When the first meeting of the commission took place, the catch had risen to 530 003 tons making it the world's twenty first largest fishery and 16,4% of the world's marine crustacean catch by weight.(100)

Although recent catches have declined from the high values of the early 1980's, 374 392 tons of krill were harvested from Antarctic waters in 1989/90. Krill further continues to dominate both the world crustacean catches and the southern ocean fishery. The catch may be far below any of the postulated levels of standing stock for this species (55 to 7 000 million tonnes) but it is still the major industrial and economic activity in the waters around Antarctica and a significant fishery by any standards. It is further argued by Nicol that the "astronomical" figures that have been put forward for the krill stock size, have made the current and past harvesting levels appear modest.(101)

The above general acceptence of the allegedly low krill catch levels has probably resulted in the commission neglecting one of the original motives behind the convention, to prevent over-exploitation of krill. The negotiators' foresight in establishing the convention before krill was in a state of decline, was in fact intended to facilitate the regulation of the fishery so that over-capitalisation could be avoided. Over-capitalisation has

been an unfortunate feature of many of the world's other great fisheries and despite CCAMLR, still remains a danger to the krill fishery. Although unfavourable economic conditions prevents over-exploitation at present, there is nonetheless no regulation which could prevent a drastic increase in fishing effort should the economic climate change.(102)

Croxall, Everson and Miller, on the other hand, have opposing views regarding the emergence of CCAMLR, as compared to those held by Nicol.(103) The aforesaid writers concede that the origins of CCAMLR, preparations for which started in 1977, derived from widespread scientific concern over the past and current status of harvestable resources in the southern ocean, and that the start of the krill fishery in 1974 was a particular focus for this concern. They further agree that there was widespread concern that the exploitation of krill should not follow that of fur seals, whales and certain fin-fish, in respect of which massive over-exploitation had reduced stocks to a small fraction of their original size. However, they maintain that the convention, in adopting an ecosystem approach (and regarding the whole of the southern ocean south of the Antarctic Polar front as a set of interlinked areas and systems requiring management principles to give attention to species dependent on harvested resources), did not highlight any particular resource for special attention. They maintain therefore that in 1982 when the commission and scientific committee started to develop approaches to and priorities for management, the following considerations were most

important :

1. There had been a catastrophic decline in the numbers of several stocks of finfish and many other stocks were in real danger of over-exploitation ;

2. Although commercial krill catches had increased from nil in 1973 to 500 thousand tons in 1982, catches from 1983 to 1985 averaged less than 200 thousand tons per annum as a result of over-exploitation. This was a small fraction of the prevailing estimates of krill stocks which ran to several 100's of millions of tons in the southern ocean. (104)

The abovementioned writers accordingly state that CCAMLR's initial priorities were :

1. To develop urgently practical management measures for fish stocks in particular trouble which would include an ad hoc group on fish stock assessment which has met annually since becoming a formal working group in 1987.

2. To exercise the management of krill stocks by :

   (a) Investigating management approaches based on catch per unit effort indices which led to a major workshop in 1989, but owing to a failure of the fisheries to provide appropriate detail information, this approach is presently in limbo.

   (b) Acquiring scientific data on krill, with regard to, inter alia, distribution, abundance, longevity, in order to create a basis for resource assessment. A working

group on krill was established as a formal group in 1980.

(c) Instituting in 1986 a scheme for reporting catch data to examine the effect of a persistent location of the fishery on krill stocks and on dependent species in local areas.

(d) Developing a system to monitor species dependent on krill, to assess whether their growth performance might be adversely affected by krill harvesting, particularly at local scales.

(e) Establishing in 1986 a working group on development of approaches to conservation which would be responsible for developing management approaches and policies for CCAMLR. (105)

Owing to the restrictive consensus decision making approach of CCAMLR, progress towards implementing any conservation management measures was initially slow. Any proposals would of necessity have to pass the close scrutiny of the members, particularly those with fishing interests, who tend to have a traditional resistance to the imposition of any restrictions. This factor was accordingly a significant obstacle to the achievements of CCAMLR. However, in 1987 and 1988 the commission agreed on a basic set of fin-fishery management policies. Thereafter, progress at establishing management measures was relatively rapid, and in 1991 all commercially fished stocks of fish were subject to at least two formal conservation measures (involving some combination of

closed areas, closed seasons, catch limits, mesh size regulation data reporting etc.).(106)

In view of the above, and particularly the consensus constraint and the inevitable difficulties of multi-national agreement on conservation strategy and tactics, Miller states that the progress of CCAMLR towards establishing formal conservation measures, including the catch-reporting system for krill, compares very favourably with other international fisheries conventions and commissions.(107) The restrictions regarding for instance size limit, catch limit, closed season, closed area etc. have been implemented in terms of CCAMLR faster than most other conventions. The writers further argue that owing to practical and conceptual difficulties, it has been problematic to develop management procedures for a fishery which could not readily be governed according to traditional fishery management techniques. Fishing nations aggravated the situation by contending that historical catch levels as a basis for setting current and future limits is unscientific ; catches are very small compared to the large stocks ; there is no intention of increasing these catches in the near future ; and krill management should be based on scientifically formulated assessments. Owing to the unavailability of adequate data, these assessments cannot presently be undertaken especially with regard to the abundance, distribution and movements of krill, and the relationships between krill abundance, availability to predators and functional aspects of predator responses.(108)

The writers are of the opinion therefore that the management of the krill fishery is progressing at a reasonable pace. It appears that there is little prospect of sufficient new data on estimates of potential yield and no prospect of data being provided by the working group on the CCAMLR ecosystem monitoring programme established to monitor the growth performance of species dependent on krill, which is likely to show incontrovertible evidence of adverse responses by predators to local over-harvesting of krill. With regard to these constraints and the opposition from fishing nations to imposing effective precautionary measures, the writers accordingly contend that progress by CCAMLR in managing krill fisheries has in fact been highly creditable. (109)

Furthermore, as previously mentioned in this article, the first precautionary conservation measure for krill (an overall catch limit for the south Atlantic sector) has been agreed (November 1991). The writers regard this as a further vindication of the overall strategy adopted by the scientific committee and commission, and also a tribute to all fishing and non-fishing members for taking a first step on the road towards the management objective of precautionary measures designed to protect species dependent on krill without imposing undue constraints on commercial krill fishery operations. (110)

6. CONSENSUS DECISION MAKING

The requirement of a unanimous vote for a decision to be made, is a principle inherent in the Antarctic Treaty and sustained at the consultative meetings.(111) This principle was also carried through into the negotiations for CCAMLR. However, conservationists feared that a requirement of consensus voting on conservation measures in the commission would result in great difficulty in attempting to impose economic regulations on fishing states. Unanimity in voting on a fishery commission generally favours harvesting as opposed to conservation minded states since a failure to agree on catch or effort limitations permits harvesting to continue without restraint.(112) It appears therefore that so long as quotas are being raised and harvesting is proceeding at levels acceptable to the ecosystem, consensus voting will not burden conservation efforts. However, once an acceptable level has been reached, consensus voting will favour over fishing as harvesting states will effectively veto conservation measures in order to achieve greater economic efficiency in their fishing efforts. Mitchell and Sandbrook accordingly argue that no quotas on harvesting would have been reached in the international whaling commission had consensus voting been applied.(113)

As an alternative, therefore, the US Draft Convention proposed a two thirds qualified majority vote on conservation matters to be decided by the commission.(114) However, this proposal did not find favour with the other delegations and the United States

eventually consented to consensus voting as part of the accommodation necessary to win the agreement of all interested parties. The convention thus provides for consensus voting on conservation measures and other important matters. Article xii (1) provides that : "Decisions of the commission on matters of substance shall be taken by consensus. The question of whether a matter is one of substance shall be treated as a matter of substance." In terms of sub-section 2 of article xii, majority voting will be utilised for decisions on other matters.(115) The convention further includes an objection procedure when a harvesting state disagrees with a conservation measure promulgated by the commission.(116)

Mitchell and Sandbrook argue that the consensus voting requirement should make the objection procedure superfluous since a state which would object to a conservation measure could simply vote against it in the commission.(117) However both mechanisms remain, the objection procedure, in conjunction with consensus voting, effectively giving a state that is a member of the commission a double veto on conservation measures. States with undisputed sovereignty over Antarctic islands in fact have a triple veto over conservation measures. Firstly, following the French example, such states would be free to indicate that the relevant waters shall be excluded from the application of any conservation measures under consideration. Secondly, such states could prevent consensus by dissenting at a meeting of the commission ; and thirdly, such states could make use of the objection proce-

dure. Clearly therefore, any state that is a member of the commission, and more particularly states with undisputed sovereignty over Antarctic islands, have the power to subvert the conservation measures essential to a successful convention.(118) The consensus voting system was adopted as a compromise between the conservation oriented members of the commission and those members most interested in fishing, who were particularly concerned that with a three quarters majority voting system they might be constantly out-voted. Hopefully, the tradition of co-operation among the parties to the Antarctic Treaty is sufficient to ensure that the commission does in fact take such measures as are necessary to implement the conservation objectives of CCAMLR.(119) However, this will not be easy under a consensus voting system where it takes only one member of the commission to prevent any conservation measure from being adopted. Furthermore, the initial decisions of the commission are particularly significant since just as it may be difficult to agree on harvest levels, protected zones, fishing seasons etc. it will be equally difficult to change a decision after it has been made. Should for instance a krill fishing industry develop and catch limits are set at a level which are subsequently found to be too high from an ecological viewpoint, it would be very difficult to achieve an appropriate reduction if one member of the commission has a vested economic interest in maintaining high catch limits. The consensus system accordingly frustrates the conservation objective of the convention.(120) The above procedures in fact makes the out-

look for rapid agreement on any controversial issue appear rather bleak. It took more than eight years to negotiate the minor resource regime regarding pelagic seals. Very intensive discussions led to the Agreed Measures on the Conservation of Antarctic Fauna and Flora, the lax standards of which were approved by the United States after fifteen years. Only the fear of the interference of outsiders prompted urgent action on marine living resources.(121) However although the consensus procedure may sometimes make it more difficult to reach agreement, and may slow the pace at which development may take place, it has the compensating advantage that those agreements that are reached command the support of all consultative parties, and are therefore more likely to be observed. These consensus arrangements appear to be workable in a context in which participants have a direct and active involvement in Antarctica, but could be less so where some participants might have no such direct stake.(122)

The main resource on which CCAMLR clearly needed to take decisions during the 1980's was fish. Possible measures were discussed at commission meetings in the light of the scientific committee's findings that several stocks were heavily fished and in need of conservation measures. In the scientific committee, proposals were made for certain drastic measures, including closure of the total fishery around South Georgia and application of global or species TAC's (Total Allowable Catches). The only formal recommendations by the committee were made at the 1984 meeting however to the effect that national measures on fish and

mesh size should be generally complied with, that an area within 12 miles of South Georgia should be closed and that certain other measures were essential. The decisions taken by the commission were somewhat disappointing and the only formal conservation measures, taken in accordance with article ix of the convention, were those which set minimum mesh sizes when fishing for different species and which prohibited fishing within 12 miles of South Georgia.(123)

In 1985, further agreement was reached on a measure prohibiting directed fishing for Notothenia Rossii at South Georgia. In 1985/86 the commission also passed resolutions requesting countries not to undertake directed fishing for Notothenia Rossii on other parts of the southern ocean, and around South Georgia, prior to formal conservation measures coming into force. This failure by CCAMLR to take drastic measures may be contrast to the French approach regarding the area around Kerguelen island. The French have established a 200 mile zone here, within which they have jurisdiction over fisheries. The French initially closed the area for one year, in 1978/79, to afford time to review the situation, and then to allow only a limited number of vessels to cooperate in the zone. The result is that the fish stocks around Kerguelen appear to be in a healthier state than those in other parts of the southern ocean. The French government were accordingly able to take such drastic measures without securing agreement from everyone in terms of a consensus decision making approach. By contrast, CCAMLR must have consensus to take ac-

tion, and experience has shown that as long as the scientific advice leaves some doubt, even if it is clear that action would be desirable at least as a precaution, no agreement on drastic measures is likely to be forthcoming. (124)

7. DISPUTE SETTLEMENT

In the event that a dispute regarding a party's duties under the convention were to arise, article xxv and the annex for an arbitral tribunal establish dispute resolution procedures analogous to those contained in article xi of the Antarctic Treaty. Dispute settlement under CCAMLR is dependent on the consent of all parties. Any unresolved dispute shall, with the consent in each case of all parties to the dispute, be referred for settlement to the International Court of Justice (which has compulsory jurisdiction) or to arbitration.(125) It is argued that article xxv removes the effect of general agreements between signatories to submit a dispute to the International Court. However failure to reach agreement on reference to the International Court or to arbitration shall not absolve parties to the dispute from the responsibility of continuing to seek to resolve it by various peaceful means including negotiation, enquiry, mediation, conciliation, arbitration, judicial settlement or any other peaceful means. In each case however it is emphasised that a special agreement of all parties is required in each instance. Article xxv is therefore no more than an agreement to a method of peaceful settlement within the meaning of the declarations of those consultative parties which have submitted to the general jurisdiction of the International Court.(126)

Disputes may therefore only be referred to the International

Court with the consent of all parties to the dispute. Since the controversy must concern the interpretational application of the convention and is not limited to two parties, there would be cause for any consultative party to intervene in an existing disagreement. For instance, assuming that the United States complains that a French Antarctic 200 mile zone contravenes article iv (2) of the Antarctic Treaty (the effective "freezing" of all claims) and both parties agree to submit the case to the Court, a third party such as Argentina may protest that it is a party to the dispute because it claims a 200 mile zone in the Antarctic and it may not be prepared to submit to the Court. Argentina would have a strong contention that it is directly affected by the dispute between the two other countries. This would be the case for the vast majority of problems to which article xxv could apply, and it has accordingly been stated that the dispute settlement procedure is the worst solution imaginable and is no more than a gentleman's agreement. (127)

The sanctions appear to be no more than a psychological form of pressure from the possible adverse opinion of other states. It is questionable however whether the consultative parties would risk controversy by attempting to put pressure on a violator. There would be an additional deterrent in the situation where the breach was attributed to a consultative party. There is generally no practicable possibility of sanction within the framework of CCAMLR and the Antarctic Treaty. The above dispute settlement procedures are not mandatory, which could lead to the perpetu-

ation of a dispute among contracting parties. However, in view of the potentially irreconcilable differences regarding the issue of territorial sovereignty and the apparent intention of the Antarctic Treaty parties to postpone indefinitely the resolution of that issue, article xxv appears at present to embody a pragmatic approach.(128)

8. COMPLIANCE AND ENFORCEMENT : INSPECTION AND OBSERVATION

Article xxi (1) of CCAMLR requires each party to "take appropriate measures within its competence to ensure compliance with the provisions of CCAMLR and with the conservation measures adopted by the commission to which the party is bound".(129) In terms of article xxii (1) each party is required to "exert appropriate efforts, consistent with the Charter of the United Nations, to the end that no one engages in any activity contrary to the objective of this convention". CCAMLR more particularly provides for the elaboration of a system of observation and inspection, requires the publication of misdeeds in certain circumstances and makes a number of reporting requirements, all of which are designed to increase the convention's prospects of enforcement.(130)

However, no distinction is made between observation (for purely educational purposes or to ensure standardised collection of data) and inspection (aimed at detecting infringements of conservation measures).(131) In terms of article xxiv (2) the commission is required to elaborate a system of observation and inspection in order to ensure observance of the provisions of the convention, and in particular, to establish procedures for boarding and inspection, procedures for prosecution by the flag state concerned and procedures for reporting to the commission any prosecutions or sanctions imposed by parties. However it is also stated that inspectors and observers shall remain subject to the

jurisdiction of the party of which they are nationals. Naturally, the criticism of this provision is that inspectors and observers appointed by and responsible to the commission may be more likely to do an effective enforcement job than those that are appointed by and are responsible to the state of which they are nationals. (132)

Individual member countries may accordingly enact legislation providing for a system of observation and inspection. CCAMLR is however not an inter-governmental law enforcement agency and it does not, at present, operate an inspectorate for detecting and reporting contraventions of its adopted measures for conservation. Observance of CCAMLR's various principles and regulations accordingly depends on voluntary self-restraint by normally competitive exploiters, drawn from different countries, having different economic systems and incentives. Experience has shown however that policies of self-restraint attending the management of fisheries in other parts of the world have not been successful. It is time therefore that CCAMLR devises and addresses a mechanism for resolving potentially competing exploitation of resources that might develop in the future if, for example, krill and krill-eaters are the targets for simultaneous exploitation in the same area. (133) Regarding the above, it is noted that within the CCAMLR area the two major zones in which Antarctic fish have been exploited are centred roughly on South Georgia, in the South Atlantic, and Kerguelen, in the South Indian ocean. Coastal state jurisdiction permits extensions of territorial regulatory measures for conservation purposes in respect of these

islands since they are located outside the boundary (60 degrees south latitude) of the Antarctic Treaty area. Despite the aforegoing, however, management of the exploiters concerned has not been generally effective. It is accordingly unlikely a management policy based on voluntary self-restraint by the exploiters of fish and krill in the Antarctic Treaty area where claims of sovereignty are not recognised at present, will be successful.(134) It appears that what is essentially necessary, is an effective inter-governmental law enforcement agency.

Despite the efforts of international organisations to inform the scientific committee of their findings, the conservation regime contemplated by the convention is likely to fail without an adequate exchange of information on catch and effort by harvesting states. The contracting parties of the convention have merely indicated a commitment to create a system for observation and inspection rather than an establishment of a system independent of the commission itself.(135) Furthermore, as previously mentioned, the concept of flag state jurisdiction and enforcement as a principle for the observation and inspection system, has been a source of abuse by harvesting states in other fisheries. Without an effective system for ensuring that conservation measures are complied with, harvesting states will be free to over-fish protected areas, exceed catch or effort limits, pollute the waters, and falsify or fail to report altogether the information on quantity, size, age, sex, and species of harvested marine living resources.(136)

Harvesting states have to date displayed a reluctance to disclose precise figures on catch levels, probably as a result of the wording of article xxiv regarding "a mere commitment to establish an observation and inspection system". The Soviet Union for instance regards the catch and effort statistics of its southern ocean fishing operations to be confidential information so as it is not bound by an agreement in force. The Soviet Union, together with other major harvesting states, Japan and Poland, in fact blocked the initial attempts to discuss any interim measures including the exchange of harvesting information.(137) A further provision which probably results in the above attitude is article xii which provides for consensus voting plus an objection procedure, effectively creating a double veto on conservation measures and on observation and inspection procedures.

A further weakness of the convention's fundamental self-policing provisions is contained in article xx which imposes a vague duty upon contracting parties to supply data and information "to the greatest extent possible". This provision raises the danger of permitting harvesting and conservation decisions to be made with insufficient knowledge about the effects of harvesting on target and dependent species.(138) Furthermore, the above duty is subject to the requirements of the commission and the scientific committee, and since decision making is to be implemented by unanimous voting, each state has an effective veto over the disclosure of harvesting statistics. Furthermore, not all harvesting information and commission activities are made public,

thereby preventing outside scrutiny. Article ix (1) (d) provides for the publication of certain information only, not all information.(139) It is further doubted by many writers that the scientific committee will be sufficiently funded and its recommendations sufficiently heeded for it to perform its vital task in the regime of providing scientific and biological restraints on economic exploitation.(140)

In terms of article xxiv (3), pending the establishment of the system of observation and inspection, the members of the commission are required to seek to establish interim arrangements according to the principles of co-operation to facilitate a system of observation and inspection, flag state prosecution, and on board inspection and observation.(141) Despite these provisions however the commission has to date not elaborated even an interim system for either observers or inspectors.

Article x of CCAMLR contains an unusual provision in that it requires the commission to reprimand states, whether parties or non-parties to CCAMLR, whose activities adversely affect implementation of the objective of the convention.(142) Article x reads as follows :

1. "The commission shall draw the attention of any state which is not a party to this convention to any activity undertaken by its nationals or vessels which, in the opinion of the commission affects the implementation of the objectives of this commission.

2. The commission shall draw the attention of all contracting parties to any activity which, in the opinion of the commission, affects the implementation by a contracting party of the objective of this convention or the compliance by that contracting party with its obligations under this convention."

As an enforcement measure, the above provision is a significant deterrent in that states would in all likelihood prefer to implement the objectives of the convention, and if they are parties, to comply with their obligations under the convention, rather than face the adverse international publicity that would result from any action taken by the commission in terms of article x above. It is noted however that article x cannot be invoked unless it is in the opinion of the commission that it should be invoked. Under the consensus voting system therefore, a member of the commission could prevent article x from being invoked, merely by refusing to agree that it was the opinion of the commission that it should be invoked. (143)

A further enforcement measure of CCAMLR are the various reporting requirements under CCAMLR which endeavour to ensure proper compliance with the objective. Experience has shown that reporting requirements made by other treaties concerned with the conservation of wild life are a useful enforcement measure since they have resulted in the provision of information which has revealed whether or not parties are complying with the terms of those

treaties. Members of the commission under CCAMLR are obliged to submit reports on their harvesting activities so as to enable reliable catch and effort statistics to be compiled.(144) Members are further obliged each year to submit any other statistical or biological data as the commission or scientific committee may require.(145) In terms of article xxi (2) each party must inform the commission of the steps it has taken to ensure compliance with the provision of the convention and with the conservation measures adopted by the commission, including information on the sanctions it has imposed for violations.

In terms of article xxiv (2) (c) observers and inspectors are required to report to the member of the commission by which they have been designated which in turn must report to the commission as a whole. In terms of article xxii (2) each party is required to notify the commission of any activity contrary to the objective of the convention which comes to its attention, irrespective of whether the activity is being carried out by its own nationals or vessels or by those of another state. The information obtained from these reports should contribute to the establishment of conservation measures and should ensure that any incidents of non-compliance are rapidly brought to the attention of the parties. Reporting requirements may further be useful as a deterrent since parties may prefer to comply with their obligations under CCAMLR rather than face the public embarrassment of having to report incidents of their own non-compliance.(146)

9. EFFECTIVENESS OF CCAMLR

An initial weakness of CCAMLR were the stages concerned with data collection and implementation of measures. Few countries submitted more than basic statistical data and the commission and its secretariat was slow in determining the particular data required and in establishing mechanisms for insuring that data was submitted properly and for processing data effectively once submitted. During the mid 1980's, the scientific committee and its working groups were relatively productive in specifying what data was required from fishing operations and for identifying scientific monitoring of associated, but unexploited species. Some fishing countries have been slow in producing all the data requested from past seasons. However, the views of fishing and non-fishing countries on what particular data should be submitted are now similar, and it is possible to be reasonably optimistic about data for future seasons. (147)

To the extent that data has been available, the analytic work has made considerable progress. A good scientific level has been achieved in this work and has been made possible by a wide participation of scientists from most member states, as well as from the Food and Agricultural Organisation, the International Union for the Conservation of Nature and Natural Resources and, as suggested in rule 2 of the scientific committee's rules of procedure, by individual scientists invited for their expertise.

The aforesaid procedure will in all likelihood improve the scientific quality of the analytical work and should furthermore help remove suspicion that the conclusions on CCAMLR are those of a closed group, acting in its own self-interest. The scientific committee has a problem regarding its analytical work, in that it is extremely difficult to provide solutions as to what measures would maintain the fish stocks as a whole at the level of maximum nett recruitment. This problem is even greater regarding more complex issues such as the complete interrelationship of the fish stocks to a krill fishery. To a certain extent uncertainties arise from the poor quality of the data, however it is in any event unlikely that better data, and more advanced analytical facilities, would allow all the doubts about a particular situation (for instance the reduction in nett growth of the blue whale population caused by a ten million ton krill fishery) to be eliminated. (148)

The lack of accuracy and precision in scientific advice has been regarded as one factor in the failure of the commission's progress in decision making. A further obstacle has been the unwillingness of some fishing nations to make adequate contributions. These two factors interact and the resulting uncertainties have the effect that no concrete action is taken at all, so long as the presumption remains that no management measure should be taken unless it is certain that it will have a beneficial effect for the fisheries. Experience in other commissions has shown the importance of a general assurance that management

measures, recently introduced by CCAMLR, are being complied with, and therefore the need to assure access by officials of one country to the fishing activities of others to establish the facts. With the establishment of EEZ's, inspection is mostly done by the coastal state, but previously several commissions made provision for authorised inspection vessels to stop fishing vessels of other countries to inspect the size of the meshes used in their nets. Prosecution of any contraventions was left to the flag state, the most important action being the establishment of the facts. Similarly, agreements under the auspices of the IWC provided for the location of inspectors of one country at the land-stations or on the factory vessels of other countries. A similar system will presumably be required for CCAMLR in order to avoid the suspicions of non-compliance. (149)

The uncertainty in the scientific advice which is available, requires particular attention. Fishing countries have refused to take concrete action to manage the fish stocks on the grounds that scientific advice should be based on the results of carefully conducted scientific research. They accordingly believe that no action should be taken until the scientific evidence clearly shows that the action will be beneficial. Although it is conceded that further research may remove any doubts that some of the measures proposed for the fish stocks (example closing South Georgia to all fishing for a period) will yield benefits, the aforementioned attitude is more likely to be applicable for measures with more complex effects. Should the krill fishery

ever reach the level at which it appears probable that it is having a significant effect on the whale or seal stocks, and that certain action is desirable in accordance with the conservation principle of maintenance of the ecological relationships between harvested, dependent and related populations of Antarctic marine living resources, it will almost certainly be possible to argue that the effect has not been proved. (150)

To exemplify the above, the change in the reproductive rates of blue whales may not be statistically significant, or it may be as a result of causes other than the krill fishery. Should action be taken before the effect has gone so far as to be beyond argument, which could mean very severe effect, it should then be recognised, firstly by the commission that scientific evidence even if strong, may fall short of proof, but should still be acted on, and secondly, the scientific committee should provide more detailed advice in order to facilitate the taking of decisions even when there are doubts. (151) In the circumstances, it appears that if CCAMLR continues to make the improvements in data collection and handling that are already in progress, and action is taken to deal more effectively with uncertainty, then it should be in a strong position to achieve the kind of ecosystem-wide management that many of its founders desired.

Miller states that a variety of political, institutional and scientific limitations contribute to and may adversely influence the convention's implemetation. (152) Firstly, the provisions of

CCAMLR do not remove, only avoid, potential conflicts associated with sovereignty. There are however effective management measures for harvesting finfish around Kerguelen island (where French sovereignty is undisputed), but negotiations to close a similar fishery in the South Georgia region which is effectively an area of disputed sovereignty, has to some extent been disrupted. This situation is further complicated by a lack of clarity concerning rights to the high seas in the Antarctic area.

Hoffman states that there are four potential impediments to the effective implementation of the convention : the novelty of the ecosystem approach, the absence of information and the question of action in a state of ignorance, the consensus decision making system of the commission and the establishment of an effective system of observation and inspection.(153) The ecosystem approach is being tackled by breaking the problem down into manageable portions. The fish are being dealt with by a single-species approach, land-based vertebrates are being treated as a separate entity. Fisheries are accordingly being managed in order to safeguard the ecosystem rather than attempting to manage the ecosystem as a whole.(154)

The system of observation and inspection is slowly developing and the first official inspection under the auspices of the commission occurred during the 1989/90 season. The problems of uncertainty, absence of information and consensus decision making however still remain. More research into the biology and distribu-

tion of krill is required and it has been suggested that the commission be more involved in this regard. Much of the information required will inevitably come from the fishery itself which has a greater seasonal and areal coverage than the relatively small fleet of research vessels which will not be able to provide sufficient information to remove the uncertainty. Management decisions on well researched fish stocks are to date not automatically accepted since sufficient information is not available or the information is ambiguous. It is submitted that information on krill, or on any other harvested stock, will never be free from uncertainties and the commission should accordingly devise methods for taking account of these uncertainties when making management decisions. (155)

The consensus-based decision-making process further requires considerable political restraint and goodwill in order to formulate and develop acceptable and ecologically sound decisions. Predominant self-interest has at times been the obstacle to negotiations on conservation measures. There have however been certain developments aimed at exploring conservation options and at formulating basic principles to guide decision making. CCAMLR has in fact been able to implement wider ranging conservation measures sooner than other international fisheries commissions. However, inherent problems that still remain are those concerned with the setting of national quotas, the establishment of a universally accepted system of scientific observation to improve the flow of data from commercial vessels, and those relating to the

settlement of disputes. A further serious limitation has been that the commission and the scientific committee have had to commence their activities while still handicapped by limited knowledge of, data on and uncertainty concerning the structure and functioning of the Antarctic marine ecosystem.(156)

Collection and compilation of essential data to ensure development of an effective strategy to manage the exploitation of Antarctic marine living resources, more particularly for finfish and krill, are far from complete. To a large extent however the scientific committee has attempted to analyse available data to determine the current status of finfish resources. Although there is no pressing need for restrictions on the krill fishery at this stage, there is a strong sentiment, at least among non-krill fishing nations (approximately two thirds of the commission's membership), that krill's perceived ecological importance and the large uncertainties concerning its stock dynamics requires the imposition of precautionary limits on the fishery sooner rather than later, in order to minimise the potential risks of over-exploitation.(157) Given the operational characteristics of the krill fishery (i.e. in remote waters subject to international jurisdiction), the commission's members require the assurance that whatever measures are introduced, will be practical and in the interests of all the convention's signatories, including both fishing and non-fishing nations. To this end, nations fishing for krill have argued that any limit on the catch remains difficult to justify in the absence of irrefutable evi-

dence of major effects having been induced by the fishery on either krill stocks directly or on its dependent predators. Non-fishing nations however argue that given current levels of uncertainty concerning the species' dynamics, it would be unwise to await a clear indication of such effects before initiating management action. It is noted that the commission is currently evaluating the merits of regulating fishing effort as well as on-sight monitoring of fishing activities to improve the flow of information from the fishery. (158)

The determination of a suitable global limit regarding the krill catch, and when it should be set, remains a problem. Implicit in this problem is the fact that the implementation of regulatory measures has been linked by fishing nations to the need to assess precisely when exploitation begins to impact significantly on krill stocks, either globally or locally. It is likely to be some time before such impacts are detectable within acceptable limits of precision. Many members of the commission however feel that appropriate regulatory measures are urgently required to minimise any possibility of uncontrolled development of the fishery in the absence of essential information on stock dynamics and yield. In the circumstances, the commission should develop a practical approach aimed at managing the fishery in selected areas, and if krill is managed separately in those areas, the potential risk of over-exploiting what may later prove to be localised stocks would tend to be minimised. (159)

Although the history of commercial exploitation of the marine living resources of the southern ocean was one of over-exploitation and mismanagement, CCAMLR appears to provide a reasonable approach toward conservation and management prior to heavy utilisation of the fishery. CCAMLR contains the provisions for compromise and accommodation necessary to achieve agreement on a wide variety of disputed issues. These compromises among competing factions include an ecosystem approach toward management and conservation, a conciliatory attitude toward coastal-state jurisdiction, the establishment of the commission with an advisory scientific committee, and multiple links to the Antarctic Treaty. (160)

There are however several weaknesses of CCAMLR, including unanimity in decision making, a failure to account for the interests of the international community, and a failure to create institutions to facilitate adequately the accumulation of essential information regarding the ecosystem. Despite the above short-comings however the overall impression of CCAMLR is a positive one. CCAMLR falls within the ambit of the five policy goals of the United States in Antarctica :

1. To maintain the Antarctic Treaty and ensure the use of the Antarctic region solely for peaceful purposes.
2. To promote scientific research and facilitate the solution of global and regional problems.
3. To protect the environment and encourage the wise use of Antarctic resources.
4. To promote the free exchange of information.

5. To maintain a suitable presence in the Antarctic and preserve US rights and interests. (161)

CCAMLR accordingly makes a conserted attempt to balance a number of competing interests and to establish a workable satisfactory regime for harvesting and conservation minded, claimant and non-claimant, Antarctic Treaty party and non-Treaty party states. There is a general recognition of the necessity of accounting for the effects of exploitation on the ecosystem despite the increasing demand for food sources, and CCAMLR accordingly signals the direction that mankind must take in co-existing with nature in the Antarctic region. Therefore, if the parties to the convention adhere to its objectives and apply its conservation provisions, CCAMLR should remain as a model of international co-operation in achieving a balance between the vagaries of commercial exploitation and the values of conservation and environmental protection. (162)

10. THE ROLE OF NON-GOVERNMENTAL ORGANISATIONS (NGO's)

There has been growing interest since the 1980's in economic, political, environmental and scientific activities in the Antarctic. Non-Governmental Organisations (NGO's) have played a significant role in generating such interest and in the formulation and implementation of policies affecting Antarctica and the southern ocean. For the NGO's, Antarctica represented the last great wilderness on earth and in addition to conservation concerns, the NGO's have expressed interest in greater participation in Antarctic affairs. (163)

The role of the NGO's is to seek to raise public awareness on issues that concern them and to influence the formulation and implementation of national and international policies. The general functions of NGO's are the following :

1. To stimulate public awareness and the development of public opinion, and the education of the public at a national and international level.
2. To influence the formulation of law and policy, at a national level, as government agencies prepare for international policy and law making forums, and at an international level, by participating in international forums as permitted by relevant governing authorities.
3. To influence the implementation of international law and policy, at a national level, as national laws are enacted to

give effect to international agreements and agreed policies, and to influence national governments in the review and enforcement of international agreements, and at an international level, officially by the participation in international forums, and unofficially by activities on the perimeter of such forums. (164)

The objectives and demands of NGO's, which are often common with those of non-Treaty nations, traditionally include the following:

1. Public accountability - there should be adequate accessible information on Antarctic activities and meetings.
2. Non-discrimination - Antarctic regimes presently work against states that cannot afford to conduct major scientific programmes in Antarctica.
3. International equity - benefits from Antarctica should be widely shared within the international community and involve the participation of a wider community in the decision making process.
4. Conservation - Antarctica's pristine nature and aesthetic values should be adequately protected in perpetuity.
5. Living resource conservation - CCAMLR should be modified in order to ensure compliance with its conservation principles. (163)

One of the most active NGO's, Greenpeace, is of the opinion that one of the major weaknesses of the treaty system is that it has not gained acceptance as the appropriate forum for Antarctic decision making from the majority of the world's nations. There

is a general objection to the exclusive nature of the Antarctic Treaty system and, in particular, the secrecy which prevents other interested states (and NGO's) from having any formal input. States which are unable to afford major scientific programmes in the Antarctic are generally excluded from any meaningful participation in decision making. It is accordingly the objective of Greenpeace that discussions on Antarctic issues in the United Nations for instance will lead to a better understanding by consultative parties, of the needs and aspirations of states outside the system. (166)

As previously mentioned, a major weakness of the Antarctic Treaty system is the lack of specific enforcement rights and procedures to consider allegations that the rules are not being complied with.

In this regard, the existing provisions for inspection under the Antarctic Treaty and CCAMLR offer important opportunities to governments regarding enforcement of environmental and conservation rules. The United States has begun to utilise its annual inspections to check environmental conditions and compliance with certain codes of conduct. (167)

It would however strengthen the Antarctic Treaty system if inspections were carried out on a co-operative basis, utilising international teams comprised of appropriate experts and including NGO's as observers. Furthermore, in order to present effective evidence as a result of these inspections, a suitable means

of recording findings would be required. It is suggested that the assistance of SCAR (Scientific Committee on Antarctic Research) committees and such other NGO bodies as IUCN be requested in conducting this type of expanded inspection, and in writing up the reports and recommendations for appropriate action."(168)

NGO's have further proposed that an infractions committee be established within the Antarctic Treaty system to consider allegations of non-compliance with agreed rules. Such a committee would maintain the credibility of the evolving system of rules and regulations.

A secretariat could be set up to take on some of the initial obligations of an infractions committee, such as publishing and circulating current versions of agreed measures and codes, receiving regular reports of inspections carried out by national governments, and providing reports on compliance to all treaty members for appropriate consideration and action.(169) Other proposals include : co-operative international investigations and assessments, public access to all documents, a right of participation for appropriate international and private organisations, public hearings in appropriate cases, co-operative monitoring and inspection, agreed national reporting requirements, some form of international review, and collective responsibility for enforcement.(170)

In the circumstances, NGO's concerned with conservation and environmental protection have a legitimate role in Antarctic affairs. NGO's normally represent a large percentage of the population all over the world, and are often more effective at presenting a global perspective than individual national representatives. However, NGO's, International Scientific Organisations and other interested groups are generally not allowed to be observers to the Antarctic Treaty system, although a few observers have been permitted to attend CCAMLR meetings. Hopefully, within the near future, all meetings of the Antarctic Treaty system will be open to such organisations as IUCN, the United Nations Environment programme, the Antarctic and Southern Ocean Coalition (ASOC), SCAR, Greenpeace and other individual international environmental organisations, all of which have much expertise to offer. (171)

(i) THE POSITION OF SOUTH AFRICA

Recent initiatives, particularly by the non-Antarctic Treaty parties, have challenged the legitimacy of SA's place in the Antarctic Treaty system, and there has been a general objection to SA hosting a consultative meeting. However, Antarctica has been insulated from the wider reach of global politics. At the 1985 United Nations general assembly, India and China in fact broke ranks with the rest of the treaty group to vote for a Mauritian resolution calling for the exclusion of SA from consultative party meetings. However, the Australian representative speaking on behalf of the consultative parties indicated that the above move did not affect the position of the rest of the consultative parties on the functioning of the Antarctic Treaty. (172)

In any event, since SA is an original signatory of the treaty, it has the right of participation in such meetings, and can furthermore block any action against it in terms of the consensus rule. There is accordingly a custom of not allowing working relations within the treaty to be affected by political differences. A further example of this was when Argentina and Britain did not allow the Falklands war to prevent both from attending a consultative meeting at the time. There appears to be strong support therefore that since SA is active in Antarctica, it should continue to be subject to the obligations of the treaty and a

member of the treaty group.(173)

SA's continued participation in the Antarctic Treaty system is accordingly based primarily on its status as one of the original consultative parties. The main requirements of this association include :

1. Continued participation in the international control and administration of Antarctica.
2. Strategic considerations arising from geographic proximity to Antarctica.
3. Participation in past (whales) and possible future (krill fishing or mineral exploration) economic activity, to preserve the economic benefits which are likely to accrue from providing a geographically convenient base with a suitable infrastructure from which to conduct activities in Antarctica.(174)

Owing to its close geographic proximity, SA's environment is likely to be affected directly by any harmful events in the Antarctic such as the depletion of the ozone layer or a rise in the sea level as a result of melting of the polar ice cap. To this end it is noted that an improved capability to monitor meteorological conditions in Antarctica was considered to be the primary motivation for establishing a SA base in Antarctica in 1942, which would be crucial to SA's weather prediction capability.(175) A further motivating factor was a genuine concern for the conservation of Antarctica's pristine environment.

In an interview with Denzil Miller, he states that SA's role in the Antarctic Treaty system could be enhanced by acting as a nexus for a southern coalition of interested parties. A regional leadership is required for Antarctic environmental protection and SA's suitability in this regard is supported by the following factors :

1. SA has shown considerable scientific interest in Antarctic affairs and environmental protection over a number of years.
2. SA is the only African consultative party.
3. SA would be perceived as an unbiased party as it is a non-claimant state. (176)

It is noted that although the United States and USSR have reserved the right to assert a basis of claim to parts of Antarctica, SA having initially regarded most, if not all Antarctica as terra nullius (land belonging to no-one but subject to appropriation) SA seems to have modified its position when it appeared to recognise the Norwegian claim in 1959 when SA took over the Norway station (the SA scientific station now known as SANAE) "situated in the Norwegian dependency of Queen Maud Land". (177)

Regarding the overall management and conservation of Antarctic marine living resources, certain essential information is still lacking. Basic scientific data (example on krill population dynamics) need to be improved and the direct (example caused by harvesting) and indirect (example resulting from pollution and tourism) effects of human activities require further monitoring for suitable scientific advice on conservation issues. This

would apply equally to the Prince Edward Islands (under undisputed SA sovereignty although also subject to CCAMLR) as to Antarctica, since these two regions are inextricably linked ecologically.(178)

At national level, therefore, there is strong support for extending recent initiatives aimed at improving current legislation on marine affairs (i.e. the Sea Fishery Act, Act 12 of 1988) and environmental matters (i.e. the Environmental Conservation Act, Act 73 of 1989) to incorporate both the Prince Edward Islands and Antarctica (with regard to specific national interest). In terms of section 18 of the Environment Conservation Act, the "Minister of Environment Affairs may by notice in the gazette declare any area defined by him, and situated in the Republic of South Africa, including the territorial waters as defined in section 2 of the Territorial Waters Act, 1963 (Act No. 87 of 1963), (which would therefore include the Prince Edward Islands), to be a special nature reserve". Such a declaration would be primarily made for purposes of the protection of the environment in such areas. The Minister may furthermore assign the control of a special nature reserve to any local authority or government institution. Miller makes the observation however that the above provisions may be in conflict with the Sea Fishery Act which is designed to promote exploitation of living resources. The effective conservation of Antarctic marine living resources constitutes the focus of the above initiatives given the potential ecological, economic and political value of such

resources. The Madrid protocol is aimed at expanding such provisions to afford protection to the Antarctic environment as a whole. The xith special consultative meeting took place in Spain in 1991 when the Madrid protocol to the Antarctic Treaty on environment protection was signed. In terms of the protocol, the Antarctic is designated as a natural reserve devoted to peace and science. The protocol's objective is the comprehensive protection of the Antarctic environment and associated and dependent ecosystems. The protocol contains a set of principles governing the conduct of all activities undertaken within the treaty area as well as a mechanism to ensure that these principles are applied. A committee for environmental protection (CEP) is established and the chairman of the scientific committee is invited to participate in the work of the CEP as an observer. All mineral resource activities are prohibited other than for scientific research. The protocol further requires that all other activities should be subject to a prior environmental impact assessment in accordance with a set of stated environmental principles. (175)

The annexes to the protocol deal with environmental impact assessment, conservation of Antarctic Fauna and Flora, waste disposal and waste management and prevention of marine pollution. The protocol further makes provision for compliance, inspection, response action and dispute settlement, which includes elaboration of Rules and procedures relating to liability for environmental damage. Further annexes will in all likelihood deal with particular aspects of environmental protection and the designa-

tion of any marine area as an Antarctic specially protected area or Antarctic specially managed area.(180) There are however certain practical problems regarding the implementation of the protocol, in that firstly the protocol's bounds of responsibility in relation to existing Antarctic Treaty instruments (example CCAMLR) have not yet been clearly defined, and secondly, owing to the protocol's complex legal character, it is unlikely that it will be ratified by the necessary number of Antarctic Treaty consultative parties until such time as there has been appropriate national legislation in each country concerned.(181)

It is further interesting to note that in terms of section 2 of the South African Citizens in Antarctica Act, No. 55 of 1962, the prevailing laws of the Republic shall apply to any South African citizen while he is in Antarctica. In terms of section 3, however, the rights or the exercise of the rights of any country under international law with regard to the high seas within Antarctica are not prejudiced or affected by the above provisions of the Act.

In view of the above, it is submitted that any future SA legislation should include the following proposals :

1. Specific recognition of CCAMLR, including the regulations promulgated in terms of CCAMLR. Therefore the responsibility for, inter alia, reporting data should be formally assumed, and there should furthermore be a statutory authority to ensure the submission of data to CCAMLR (de

facto, this has been the Sea Fisheries Research Institute). A formal enforcement body is accordingly required.

2. A formal process of exclusion is required in order to limit the scope of CCAMLR and give greater sovereignty to SA. This would hopefully ensure more dynamic conservation measures and enforcement procedures.

3. A practical mechanism is required to appoint a suitable authority or persons (possibly the SA Navy) as a law enforcement body.

Clearly the above proposals can only relate to the Prince Edward Islands, which is an undisputed SA area. France has exercised similar proposals in relation to Kerguelen, where CCAMLR has been acknowledged but not necessarily enforced.

12. CONCLUSION

The Antarctic Treaty system, endorsed in terms of the principles of the United Nations Charter, has generally been accepted by the international community as part of the structure of international relations. It has kept Antarctica free of international disputes, open to international co-operation, and has in practise been an effective and dynamic international legal instrument for the international community.(182) The treaty has further prevented the extension or creation of national claims for the treaty's duration, kept the continent open for the peaceful use by all, with bases open to scientific visitors, banned militarisation and provided for other eventualities hereinbefore discussed. The treaty has been supplemented by CCAMLR, the Agreed Measures for Conservation of Antarctic Fauna and Flora, the Convention for the Conservation of Antarctic Seals, and a proposed Antarctic minerals regime. It is noted however that when the United Nations was created in 1945 there were approximately 50 member states. Approximately 100 further states are now members, and these mostly less-developed nations have begun to take an active interest in access to all unclaimed or undistributed resources on earth, including the Antarctic. These states have accordingly questioned the exclusivity of the Antarctic Treaty arrangement and taken exception to the fact that they have been left out of critical decision making.(183) Most of these nations remain poor and acutely sensitive to economic and

political domination by the western powers. These new states further represent an emerging political force that has disrupted the "closed club" of an earlier, more exclusive international society and in the process, have exerted a notable influence on the recent evolution of international legal principles, such as equitable sharing of wealth and resources and rights to participate in making decisions of international concern. Clearly these concepts challenge the current alignment of power in Antarctica. (184)

Hence the emergence of the Malaysia group, which has already become part of the fabric of the general assembly agenda as well as of the proceedings of regional bodies such as the Organisation of African Unity (OAU), the south pacific forum and the non-aligned movement itself. There is a strong belief in the principles of universality and the "common heritage of mankind", and bearing in mind the anticipation of major exploitable quantities of oil and other minerals in Antarctica, the Malaysia group will continue to direct pressure at the membership. (185)

It is noted that although the proposed Convention on the Regulation of Antarctic Mineral Resource Activities (CRAMRA) (1988) has been abandoned, a draft proposal to ban all mineral activity for 50 years was accepted in 1991.

It is accordingly argued by the Group that no Party or exclusive association of parties should exploit non-renewable resources, create dangers to the environment, or establish any system of

exclusive control in spaces that are, or may become, of great value to mankind in general. Thus it is desired from a utilitarian perspective that the management of the Antarctic and its resources should come under wider international control than provided by the Antarctic Treaty and that decisions concerning the use or preservation of "common-space" regions and resources should be made only through a process that accounts for all major interests of the world.(186) However, although the argument for greater internationalisation can be justified as a matter of principle, it is submitted that it would not be practical in that the management of living resources would become more cumbersome.

Presently there is little economic pressure to harvest beyond sustainable levels (with the exception of the finfish), but traditionally, there have been various cases of dramatic expansion in fisheries when economic possibilities become attractive. Should there indeed be great pressure for rapid expansion, it is doubtful whether CCAMLR, or any multilateral regime would be successful to cope with such pressure. A further obstacle for the implementation of effective management measures has been the objection opportunity inherent in the consensus decision making procedure. As previously mentioned, a country could object to any management proposal, so that it was no longer binding on that country. International fishery commissions were therefore slow in introducing measures and those that were introduced, such as controls on the mesh size of nets or on the sizes of fish, put no great restrictions on fishermen's activities. Measures

regarding catch limits and quotas have been even more difficult to process.(187)

A further problem in the management of fisheries by international commissions has been the treatment of uncertainty. There are inevitably inherent doubts and uncertainties in any scientific analysis of a fish stock, and honest scientific advice will reflect those uncertainties. Some nations have used such uncertainty to their advantage in seeking less restrictive measures, for example higher quotas, by emphasising the more optimistic of the estimates. The consensus decision making procedure would make such action possible. A state with jurisdiction over a resource could take either a balanced view or a deliberately conservative view, perhaps allowing only the catch limits that the scientific evidence would suggest is safe.(188)

To this end, the French have been particularly successful in managing the finfish resources around Kerguelen, compared to the inadequate measures invoked around South Georgia (an open area) and in other areas of the south Atlantic. The French, in ignorance of the status of the stocks, closed the fishery until reasonable scientific estimates could be made, whereas although the scientific committee recommended a closure of the fishery around South Georgia, no such measure was achieved in the 1980's. It is submitted that a further problem of CCAMLR is that it concentrates not only on the conservation of individual species, but on the conservation and protection of the ecosystem as a whole.

This complicates matters in that data requirements are not straight forward and are in some cases ambiguous. There is no all-embracing and accepted body of theory and it is accordingly difficult for a reasonable consensus on even the scientific questions to be achieved. (189)

The development of previous fisheries commissions has shown that some form or sovereign pressure is required to achieve satisfactory conservation goals. For instance, the success of CCAMLR regarding South Georgia, might require the declaration by the relevant authorities of an EEZ around South Georgia. Similar considerations might be advisable for direct harvesting which has been proposed for the now abundant fur seal colony on South Georgia. The greatest benefit of such an approach would appear to be sound resource management that normally stems from individual national ownership and control . Some writers further argue that the national approach is more equitable in that it allows those nations which had the early foresight and initiative to explore the Antarctic, to profit from the natural wealth which their efforts have made available. (190)

However, the involvement of the UN general assembly in Antarctic issues, and the dissatisfaction amongst some environmental groups with both CCAMLR and the environmental aspects of the Antarctic Treaty, are both pressures contributing toward further internationalisation of the Antarctic. Such further internationalism is however not likely to improve the ability to achieve

conservation goals. It has been proposed that either the membership of CCAMLR is extended, or there be fuller involvement of the United Nations. However, although membership of the IWC had in the 1980's led to a reduction in whaling, whaling continued despite a majority vote for a moratorium. The reduction was in fact only as a result of American pressure on various states via the Packer - Magnusson Acts, which effectively imposed "sovereign like" pressure on the world's whaling fleets. The fact of these acts is that where a marine conservation treaty acceded to by the United States has been undermined by another state, the US would cease all trade or business in fisheries with that state. This has been particularly successful with regard to the elimination of "pirate" whaling.(191) It is submitted that further acts of the nature described above are required since a primary weakness of the Antarctic Treaty system, which stems from the need to avoid prejudicing either claimant or non-claimant states, is its lack of specificity with regard to enforcement rights and procedures to consider allegations that the Rules have not been complied with.(192) Vertical movement for further internationalisation of the Antarctic Treaty regime is likely to weaken rather than strengthen its ability to successfully reconcile conservation and development. Historically, the successful operation of conservation regimes on exploited resources has been achieved with the imposition of some effective and authoritative management. This situation is not likely to change and in the past, such management has only been achieved when states

have operated an effective sovereignty over the management of the resources.(193)

In the final analysis, CCAMLR is the only available instrument specifically aimed at conserving and protecting Antarctic living marine resources. Given the perceived ecological consequences likely to arise from over-exploitation of resources such as krill, every effort should accordingly be made to utilise CCAMLR's important provisions, particularly those aimed at balancing rational use and conservation of the Antarctic marine ecosystem as a whole. Therefore the development of an effective approach to defining criteria for the management of Antarctic marine living resources should also determine acceptable limits for the effects of exploitation of krill on other elements in the ecosystem before exploitation levels are allowed to increase significantly.(194)

Recent developments (particularly the precautionary catch limit on krill in the Atlantic sector) support the overall strategy which the commission has adopted to deal with the limitations of CCAMLR. These developments mark the first initiatives toward a consensus-based, management procedure which is aimed at protecting species dependent on exploited stocks without imposing undue constraints on fisheries development.(195) Management decisions made by the commission should further reflect the viewpoint implicit in CCAMLR, that there is no conflict between the concepts of rational use and conservation. Any future recommenda-

tions should further include effective enforcement mechanisms to ensure that such decisions are adhered to.

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