The sea as a strategic domain

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Resumé

Det 21 århundradet är havets sekel. Världsekonomin är direkt beroende av sjötransporterna; 80-90 % av alla varor, beroende på hur man räknar, transporteras till sjöss. Från havet kommer en allt större del av de resurser som människor behöver: fisk, energi, viktiga metaller och andra råvaror. Havet spelar också en avgörande roll för klimatet. Konkurrensen om dessa resurser driver fram konflikter och gör att rörelsefriheten till sjöss hotas, vilket i sig är konfliktdrivande. Havet är också en idealisk transportväg för illegala produkter. Utöver smuggling hotas verksamheten till sjöss av pirater och terrorister samt av all annan, ”normal” brottslighet. Det illegala fisket är omfattande och medför svåra konsekvenser. Allt detta gör att statens maritima förmåga blir allt viktigare. Härtill kommer de ”normala” marina uppgifterna: diplomati, avskräckning, skydd och maktprojektion.

THE 21ST CENTURY is a maritime century. The sea is more important than ever for global and local transports, for its resources, for its vital importance on our climate, and because of its illegal use by organised crime including pirates and terrorists. Consequently, maritime strategy is also more essential than ever. Discussions on maritime strategy, however, do not too often discuss the object of maritime strategy: the sea. This is the aim of the present article.

The article is a somewhat adapted version of a chapter in my book *Stratégies maritimes au xxie siècle. L'apport de l'amiral Castex*, Nuvis Paris 2015, now undergoing translation into English. I would greatly appreciate any comments that could ameliorate the text (to lars@wedinstrateg.fr)!

What is the sea?

There are many ways of describing the sea. For those who do not have at their disposal the necessary means – at least a boat – nor the necessary knowledge, the sea is an obstacle.

> *'How inappropriate to call this planet Earth when it is quite clearly Ocean'*[1]

This is probably the reasoning behind the old adage: "The tears have a taste of salt in order to remind fallen sovereigns about the sea that they have neglected."[2] To others, the sea links together continents, countries, cultures, and their peoples as well as ideas, industries, and markets. The sea is a necessary precondition for the globalisation and its importance is partly proportional to the magnitude of globalisation. Put in another way, with globalisation follows a maritimisation of world politics. Maritimisation, in turn, consists of four main themes: transports, exploitation of resources from the sea, the illegal use of the sea, and, as a corollary, the increased importance of maritime forces. To this list one can add the increased understanding of the importance of the sea for our climate.

The sea covers 70 % of the globe's surface. Half of the world's population lives less than

80 km from a coast where also two thirds of the world's wealth is produced. One could, hence, talk about a *littorialisation* of the world's economy.[3]

As a comparison, the range of an embarked cruise missile, such as the U.S. Tomahawk, is between 1,250 and 2,500 kilometres depending on the model. The majority of the world's population is, therefore, within reach of a cruise missile launched from the sea. The first U.S. attack against Kabul in 2001 is said to have been launched from a submarine.

The ocean occupies the main part of the sea. For practical reasons, the ocean is usually divided into five parts: the Pacific, the Atlantic, the Indian oceans as well as the two extremes: the glacial Arctic and the Antarctic. In reality, these oceans are linked to each other. Close to the coasts, there are the pericontinental, or narrow, seas such as the Mediterranean, the Baltic Sea, the North Sea, and the Chinese Sea, etc. These are linked to the oceans by more or less wide straits. As a consequence, all maritime activities have a global aspect.[4]

The maritime passages between the pericontinental seas and the oceans are generally of strategic importance as illustrated by the Malacca Straits, a real spider in the global web of transports. There is a long list of such straits as the Strait of Gibraltar, the Baltic Approaches, the English Channel, and the Bosporus, which are the principal European junctions. The importance of the Suez and the Panama canals can hardly be overestimated.

Naturally, the main part of human activities is concentrated close to the shore. This is true for fishing but also for other resources like oil and gas.

The harbours with their infrastructure constitute the passage between sea and land. It is from there that cargo is transported further inland and vice versa. Consequently, they play a vital strategic role in the transport system. Its safety and security is, therefore, of vital importance – an often forgotten fact in strategic discussions. In a modern, intermodal transport system the harbour is the pivot as the speed of transport is dependent on quick and safe change of mode of transport between ships and various inland transport systems like railways, waterways, and roads.

The military and strategic conditions at sea are different from those on land. The sea cannot be occupied in the military sense of the word; there are no front lines and defence cannot be based on fortifications in the same way as on land.

European Union

The EU is intensely linked to the sea and has the potential to become a strong maritime actor. Counting in tonnes transported multiplied by the distance travelled; nearly 90 % of the EU's external exchange is transported by sea as well as 40 % of its internal exchange.[5] Furthermore, 40 % of the EU's GNP depends on the use of the sea.[6] The total length of EU coastline is more than 90,000 km and holds more than 1,200 harbours. In spite of very hard competition, 40 % of the world's merchant fleet flies the flag of an EU member state.[7]

The *Blue Book* on an integrated EU maritime policy starts with the following words: "The seas are Europe's lifeblood. Europe's maritime spaces and its coasts are central to its wellbeing and prosperity – they are Europe's trade routes, climate regulator, sources of food, energy and resources, and a favoured site for its citizens' residence and recreation."[8]

Against this background, the EU has created an *Integrated Maritime Policy* which has the objective to: "provide a more coherent approach to maritime issues, with

increased coordination between different policy areas."[9] One of these sectors is blue growth, meaning a sustainable growth in maritime sectors. This economy today represents around 5.4 million jobs and an added value of almost € 500 billion a year. The blue growth project encompasses aquaculture, coastal tourism, blue biotechnology, ocean energy, and seabed mining.[10]

Another important area is the support of research on the sea.[11] In fact, the knowledge of the sea is still very limited. Only about 10 % of the ocean floor has been explored so far.[12]

In October 2014, the EU adopted the *Limassol Declaration for jobs and growth*. This document places the maritime sector at the real heart of the policies aimed at redressing the EU economy.[13] For instance, it is hoped that the number of jobs in the maritime sector could rise to more than 7 million.[14]

The next step in this development is the *EU Maritime Security Strategy*. This strategy should provide a common European framework on the national and European level for the development of responses to maritime threats and risks. It will also strengthen the link between internal and external security. The strategy has three main goals. First, it should identify and articulate the main strategic interests of the EU. Second, it should define maritime threats, challenges, and risk to EU maritime interests. Finally, the most important part is to organise the response.[15]

In December 2014, the Council adopted a wide-ranging Action Plan.[16] However, the Action Plan of the Dutch presidency from December 2015 does not mention the maritime security strategy.[17] Nor does the 'Trio programme'of the Dutch, Slovak, and Malta presidencies mention this issue. There is one exception, though, the idea of a *European Border and Coast Guard* system.[18] This is, however not a proposal for a Coast Guard in the word's normal sense but a project for an organisation for filtering migrants.[19] The idea of a *Common Information Sharing Environment* for the surveillance of the EU's maritime domain or CISE seems at present to be put on hold.

To conclude, Europe is dependent on the sea for its security and prosperity. For the time being, however, all energy in the maritime arena seems directed towards the migration crisis. It might, nevertheless, be possible to develop the proposed Border and Coast Guard system into something useful, but that remains to be seen.

The freedom of the seas

Outside the territorial seas, there are international waters, including the high seas, which are *res communis*. This signifies that the high seas do not belong to anyone or, better; they belong to the population of the world in its entirety.[20]

The sovereignty of a coastal state extends over the territorial sea until 12 nautical miles (NM) from the coastline.[21] The costal state may extend its competence into a contiguous zone, up to another 12 NM, regarding customs, tax, immigration, and health issues.

The coastal state has a monopoly regarding the resources of the sea in its *Exclusive Economic Zone* (EEZ), which stretches out 200 NM from the coastline.[22] It also has a monopoly on the resources on its continental shelf up to 200 NM from the baselines, or, in accordance with certain rules, up to 350 NM.[23]

One of the basic principles of UNCLOS (*United Nations Convention* on *the law of the Sea*) is the right of freedom of navigation: ships may navigate freely at sea even on territorial seas of other countries provided

that the passage is innocent: "Passage is innocent as long as it is not prejudicial to the peace, good order or security of the coastal state."[24]

The freedom of navigation is a very important factor underpinning the strategic importance of maritime forces; in particular in peacetime and in a crisis. The idea of freedom of navigation is, however, more and more contested for economic, safety, environmental, and political, reasons.

To begin with, the resources of the sea are increasingly in demand: gas, oil, minerals, and other substances are produced on and under the seabed and in/by the sea itself. As a result, more and more infrastructures are placed in the sea within the EEZ and on the continental shelf: platforms of various kinds, wind turbines, turbines for wave or tide power, etc. Each item just has a safety radius of 500 m. Nevertheless, with hundreds of wind turbines, their sum will cover quite a large space at sea. This phenomenon, which we will call *infrastructuration* of the sea, affects the freedom of navigation and has strategic, operational, and tactical consequences.

The infrastructure at sea is, depending on its type, also manned. In effect, hundreds of thousands people work on the tens of thousands of platforms of various designs in service around the globe.[25] As a consequence, the infrastructuration of the sea leads to a *sedentism* of the sea. All these assets, and the people manning them, need maritime forces for their safety as well as security.

Secondly, especially in confined waters with a high rate of traffic like the English Channel or the North Sea, navigation becomes more and more regulated. It is necessary to create a safe balance between more or less conflicting interests: the flow of merchant ships and other vessels, fishery, infrastructure, and environmental concerns. These parts of the high seas will not be free in the old sense, but organised by spatial planning. In fact, the EU has established a framework for maritime spatial planning that specifies certain minimum standards.[26]

The result will be a canalisation of maritime flow, which, obviously, will impede the freedom of navigation. When one adds the problem of congestion of ports, the requirement of regulation will become even stronger as each delay – ships waiting for days, maybe weeks, outside a congested harbour – costs money. The end result may be a kind of sea control system along the lines of air control with time slots for ships following the most important sea lanes.[27] Such a system is, in fact, already on its way through the *EU Sea Traffic System* (STM) now undergoing development. The idea is to increase safety and reduce cost through a common distributed traffic management system; this is a decentralised system, not a 'Euro Control for Sea Operations'.[28]

One can only speculate about the consequences of such endeavours in a time of crisis when there is a more or less clear threat against navigation from, for example, terrorists. One obvious consequence is the need for surveillance of the sea and, in particular, such regulated zones. It should be underlined, however, that it is not only the surface that needs surveillance but also the volumes under and over the surface, respectively. Furthermore, surveillance without means for action is not of great interest.

Thirdly, the race for natural resources risks leading to an enlargement of the zones defined by UNCLOS or, worse, a rejection of the present convention. Voices are already being raised proposing its renegotiation. Such an endeavour is probably doomed to fail with chaos as consequence.

Today, China is the most radical nation, as its claims on the East and, particularly,

the South China Seas are in clear contradiction with UNCLOS. In fact, China defines a 'national blue territory' of most of the South China Sea in contradiction to the legal claims of other riverine states. This 'blue territory' is claimed as an EEZ, but without the normal rights of freedom of navigation for warships.[29] The Chinese claims are based on history – as interpreted by China – in contrast to the definitions in international law.

These claims have at least two consequences. Firstly, it leads to conflict with the USA, which, in spite of not having ratified UNCLOS, is its most ardent defender. Secondly, the claims risk leading to a more general thrust towards *territorialisation* of the sea. The infrastructuration of the sea is certainly an important factor in this regard. And China is not alone. Russia, for instance claims the Lomonosov Ridge from Siberia to Greenland and Canada as part of its continental shelf. It also claims that the Northeast Passage as being part of its internal waters.[30]

Fourthly, there are more and more nature reserves at sea. The US government, for instance, has classified 860,000 km² as 'national monuments'. In this area, commercial and pleasure fishing is forbidden as is mineral exploitation, the dumping of waste, and mining, etc.[31] Likewise, the French government, in cooperation with its neighbours and the European Commission, has established an ecological protection zone in the Mediterranean.[32]

Obviously, this development will have consequences for shipping, including naval activities. However, a coastal state cannot claim more rights for a nature reserve than those that exist according to UNCLOS. The Convention gives it rather great latitude in defining the roles for the protection of the environment in its EEZ but they have to be defined in concert with other states. Furthermore, such areas on the high seas are only binding for the state that establishes the rules, not third states.[33] These rules may, quite obviously, become roots of confrontation between various interests at sea. They will probably also impede the liberty of manoeuvre for naval activities – not so much for legal reasons but for political ones.

To conclude, the freedom of navigation according to UNCLOS is under increasing pressure for several reasons: political, technological, economic, environmental, and those of safety. The extent of impediment for naval operations will partly be a question of power – the U.S. Navy will not easily give up its freedom of navigation, while small states will have to, as always, abide to the rules of the powerful. Partly, it will be a question of politics; what is the political price for extending rules impeding navigation relative to the price for breaking these rules? These deliberations will be important in peace and in a crisis, hardly in the case of war.

One practical consequence is clear, however; a naval force commander needs a legal advisor.

Transports

The sea constitutes the axis of trade on which global commerce depends. Depending on the method of calculation (volume, weight, or value), 80 % to 90 % of global commerce is transported by some 59,000 ships of more than 500 tonnes.[34] Because of the policy of just-in-time, enterprises have very little stock at hand; most of it is in reality on its way in ships, especially in containers. The reason is, of course, the search for economy and the reduction of overhead costs. Thus, *globalisation* is equal to *maritimisation*, which is equal to *containerisation*. This latter development has revolutionised the global transport systems thanks to its low cost, in particular

when very big container ships are used. In fact, to ship a container from Shanghai to Paris costs about € 840, while transportation cost of a container from Paris to Lyon is about €500.[35]

Take the example of an iPhone. Conceived in Silicon Valley, its raw material comes from Asia, Africa, Russia, and Latin America. Computer memories are made in Korea and Japan, the processors in the USA, the screens in Korea, the batteries in China, and the semiconductors come from Germany, etc. The whole set is assembled in China or Brazil. And then it has to be transported to the customer. Each step requires transport by sea.[36] This scheme should be seen against the fact that Apple sold 74 million iPhones just in the first quarter of 2016.[37]

Transported volumes are almost continuously increasing. From one billion tonnes in 1960, the sum was 8.3 billion tonnes in 2010.[38] Oil represents one third of the total volume and constitutes the principal merchandise transported by sea.[39] On the other hand, shipping is very sensitive to financial variations. This is evident when looking at figures from Eurostat: the financial crisis of 2008–2009 represents a change from around a 3 % yearly growth to nearly a 9 % reduction in 2009! From 2010, the growth is back although on a reduced and unstable level.[40]

The size of ships increases all the time. The new *Marco Polo* (CMA CGM) carries 16,000 TEU[41] and the largest tankers are at 400,000 DWT,[42] which at this time is considered as being a limit.[43] Interestingly enough, there have been larger ships, the tanker *Mont* built in 1979 was at 564,000 DWT; she was beached for scrapping in 2009.[44] To get an understanding of what this implies, one could mention that it takes 10,700 lorries or 200 trains for carrying all the containers of the *Marco Polo*.[45] This figure gives us an idea of the logistic requirements for a modern container harbour. The intermodal system is heavily dependent on the cyberspace in order to handle questions like 'where to load a certain container which is where?' in order to speed up handling in the next harbour. Obviously, this also implies vulnerability for cyber-attacks.

What is less known, is that 95 % of electronic communications are also transited by sea. In fact, the information necessary for our contemporary societies flows through optical fibre cables on the seabed.[46]

The absolute majority of transports by the sea are civilian and commercial ones. Nevertheless, military operations are mostly dependent on sea transport, in particular for heavy equipment. Regarding military communications, the fact is that nearly all heavy equipment has to be transported by the sea. An amphibious ship like the French *Mistral* can transport half a regiment including its heavy equipment for an extended period of time, while an aircraft of the type C-17 Globemaster cannot transport more than 154 soldiers with their personal equipment – and this only for a short time.

The shipping market is extremely international and at the same time very unstable. 50 years ago, a Swedish ship was owned by a Swedish company, its crew was Swedish and she sailed under a Swedish flag. These clear national links do not exist anymore. Ships can be chartered or leased from company to company at short notice. Crews are often hired from specialised firms; sailors from the Philippines dominate the market. A large part of the international fleet sails under flags of convenience. The three most popular are Panama, Liberia, and the Marshall Islands, but this does not mean that these countries own the ships; the three biggest owner countries are Greece, Japan, and China.[47] This difference is important

as it is the flag state that is responsible for administrative, technical, and social matters of ships flying its flag.[48] In a conflict, it is the flag state that should protect its ships – which is obviously not possible for the three mentioned above.

The sea is dangerous. Hard weather and areas where navigation is difficult have always posed dangers for ships. In the past, problems were mainly economic and human. Today, the environment is very much in focus; the French company Total that had chartered the tanker *Erika*, which sank in 1999, was sentenced to pay € 375,000 in fines and € 200 million as compensation to civil plaintiffs for the damage caused by oil spills.[49] And *Erika* was not a very big tanker.

The sea is, obviously, even more dangerous in wartime. As an example, the USA lost 1,768 ships during WWII.[50]

Transport at sea is certainly the most economic and environment- friendly way to transport merchandise. But the dependence of transport, which is inherent in globalisation, is also a vulnerability. An important strait closed by mines or a harbour blocked by strikes will quickly have severe consequences, as enterprises often have very little stocks. As an example, after 12 days without imports, Sweden will lose 50 % of its daily foodstuffs.[51]

The ocean – the lungs of the world[52]

"*The oceans are cornerstones of our life support system. They provide many essential ecosystems goods and services essential for humanity, including food, medicinal products, carbon storage, and roughly half the oxygen we breathe.*"[53]

The big forests are often called 'the lungs of the world' but the real lung is the ocean. In fact, the ocean plays a vital role for our climate. The ocean releases 50 % of the oxygen we need for our respiration. It also absorbs 80 % of emitted greenhouse gases; without this mechanism global warming would go much faster. But this leads to an acidification of the sea with serious consequences for the fish stock and coral reefs.

The ocean also absorbs warmth from the atmosphere, which, on the other hand, leads to its warming down to about 700 m and as a consequence a reduced ability to absorb CO_2. This warming is also aggravated by the melting of the ice cap. The latter phenomenon also means an increase of the level of the surface of the sea.

The warming of the sea leads to the migration of the fish population which tries to find colder water more deeply or towards the poles with potentially serious consequences for fishermen, particularly in the Third World.

Plankton (phytoplankton) plays an important role in these processes through photosynthesis and as a basis in the food chain.[54] However, plankton is to an increasing extent mixed with small pieces of plastic, which reduces the effect of these processes. On the whole, the 'mountains' of plastic drifting in the sea is a very serious problem.

One important effect of ocean warming is extreme weather, precipitation, flooding – aggravated by increase of the level of the surface of the sea – and, in particular, tropical cyclones.[55] These effects have obvious strategic and operational consequences.

The fact that the ocean, to a great extent, is *res communis* regrettably also means that no state feels responsible. This is the reason why the Ocean was, on the whole, absent from the climate conference: COP21.

What does this have to do with maritime strategy? The answer is that climate change risks creating or aggravating conflicts because of dwindling resources and an increased level

of the sea, to which one can add all other problems caused by waste, emissions, and general pollution. Consequently, the protection of the environment is an important mission for maritime forces.

The increasing understanding of the importance of climate change will also have repercussions for naval forces. It is easy to imagine international claims on reduction of their emissions. In fact, the US Navy is already on its way. The USS Stockdale ((DDG-106) is an *Arleigh Burke*-class guided-missile destroyer) is the first naval ship to use biofuel. She belongs to the aircraft carrier group formed around USS *John C. Stennis* which experiments with various replacements for fossil fuel as part of the project named the *Great Green Fleet*. In fact, the US Navy believes that, by 2020, 50 % of its energy will come from alternative sources.[56]

Resources

Julian. S. Corbett famously wrote: "Command of the sea, therefore, means nothing but the control of maritime communications, whether for commercial or military purposes. The object of naval warfare is the control of communications, and not, as in land warfare, the conquest of territory. The difference is fundamental."[57]

This is, however, not true today. The sea itself, thanks to its resources, is vitally important in its own right.

Fish is the most well-known of these resources. Today, more than 50 % of the fish consumed comes from fish farms. The fishery sector employs 45 million people and represents 15 % of the protein needed by the world's population.[58] For 1 billion people, fish is the main source of protein.

The fish stock is threatened by pollution and overfishing. 30 % of the fish stock is overexploited and 50 % is exploited to the maximum level. There are serious attempts at regulating fishing activities, not the least by the EU, but resistance in some circles is very strong. One problem in this regard derives from the freedom of navigation: only the flag state can control fishing-vessels outside the EEZs. Furthermore, weak states, particularly in Africa, lack the resources to control activities in their waters and their EEZs.

Another resource becoming more and more important is the water itself. Through inverted osmosis it is possible to desalinate seawater at a reasonable cost (€ 0.3 – 0.9 m^3).[59]

Electricity from the sea is another important resource that is under continuous development. Great Britain is one of the leading countries when it comes to wind turbines; more than 5 GW is produced at sea. Wind turbines are, however, contested as they are ugly and have consequences for wildlife; their cost is also high. Other methods are now under development like turbines driven by marine currents or devices that use tidal changes or waves to produce electricity. In warm waters (> 20° C) it is also possible to use the difference in temperature between the surface and deeper areas (4° C).[60]

From an economic standpoint, oil and gas are the most important resources; 30 % of the world's production of oil and 27 % of gas are extracted from the seabed.[61] One third of the world's production comes from oil rigs at sea. It is deemed that 40 % of new resources of oil and gas will be found on the seabed.[62] The present low price on oil, however, has implied a slowdown in the opening of new fields, in particular in the Arctic. The fact that man is able to work on ever deeper waters will make more and more resources manageable and economi-

cally viable. The present record is 3,174 m in Indian waters.[63]

The latter development also means that minerals on the seabed become accessible. The most important minerals are polymetallic sulphides, polymetallic nodules, and cobalt.[64] The nodules contain rare earth metals of vital importance for the electronics sector. This is of real strategic importance, as today China is responsible for 95 % of the world's production and holds 36 % of known reserves on land. The nodules are situated in very deep waters while other minerals are to be found at depths more easily accessed; 400–4,000 m.[65]

According to UNCLOS, resources that are outside the continental shelf constitute a 'common heritage of mankind'. It is the *International Seabed Authority* that is responsible for giving authorisation to explore this 'heritage'.[66]

Furthermore, the sea contains interesting species for a range of industrial activities. The haemoglobin existing in tube worms will, for example, probably make it possible to produce artificial blood. A recent study has identified 18,000 products originating from the sea and no less than 4,900 patents.[67]

As resources on land are becoming exhausted, those in the sea achieve an even more strategic value. Deep-sea mining is still in its infancy but will probably become economically competitive. It is, therefore, quite possible that conflicts will arise as a result of competition between those states that have the required technology. The Chinese expansion into the 'blue territory' is an example.

Another consequence of this development is the increasing infrastructuration of the sea. This infrastructure will need to be protected against the vagaries of nature and attacks from pirates and terrorists as well.

Tourism and recreation

Usually, tourist activities are not discussed in a strategic context. Such activities are, nevertheless, of great economic interest – and hence of strategic concern. Tourists are also a classic target for terrorists and organised crime.

Tourism at sea is an extensive activity. Each year, more than 400 million passengers transit European ports on cruising ships, ferries, and other ships. In 2012, the *Royal Caribbean Cruise Line* signed a contract with a French yard on a new ship worth one billion euros.[68] The new *Harmony of the Seas* will be in service in 2016. She has a crew of more than 2,000 and takes more than 5,000 passengers.

Such big ships may create great damage to a sensitive environment. They also create dangers. It is easy to imagine the consequences of a fire on board – perhaps as a result of terrorist action. There is probably not a coast guard in the world that could handle such a disaster.

Crime and terrorism

Maritime transports are not always legal. The sea also serves as a highway for a lot of illegal merchandise. From a financial point of view, the drug trade is certainly the most important and, subsequently, the smuggling of cocaine from Central and South America. An interesting case is the seizure in 2013 of 101 tons of cocaine, worth € 7,000,000 on the street, transported in a missile-shaped container attached to the hull of a Dutch cargo ship.[69] The French ministry of defence has underlined that "since 2008, the maritime space is the theatre of a development of a maritime criminal flow (drugs, people, weapons – including weapons of mass destruction), favoured by the dense

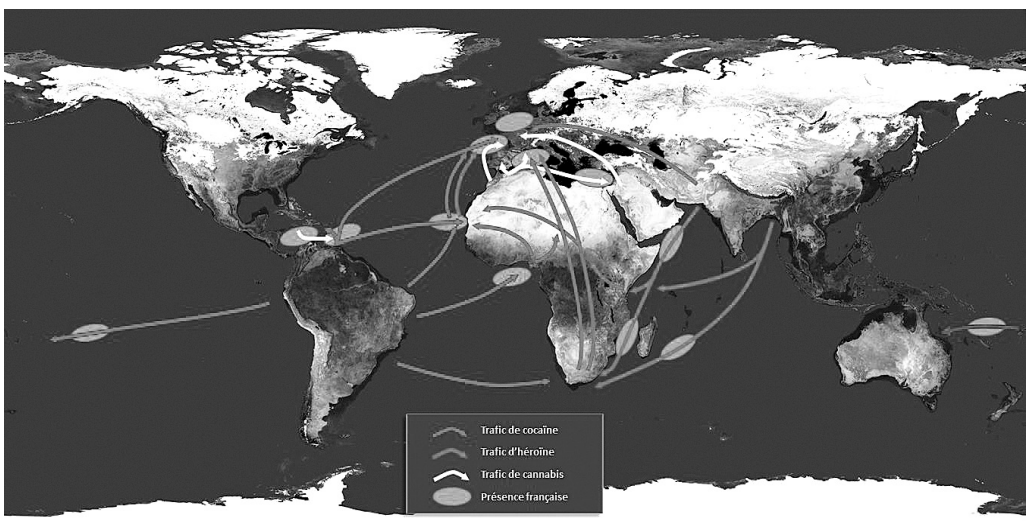
circulation of containers that facilitates the dissimulation and by certain fragile states that are incapable of imposing control of their territory."[70]

As is shown in the map below, the smuggling of drugs is, to a great extent, a maritime issue.

Piracy is the historical scourge of seafarers believed to be abolished, except in books and films of adventure. This is not the case. The number of piracy attacks has, however, been on the decline for several years. The 2014 third quarter global report on piracy from the *International Maritime Bureau* (IMB) showed 178 incidents so far that year, down from 352 for same period in 2011.[72] Most attacks from piracy and organised crime now occur in the Gulf of Guinea and Southeast Asia.[73] There are only a couple of reports from the western Indian Ocean. This is certainly due to international naval patrolling in the area by, inter alia, the EU (operation ATALANTA).

Piracy is by definition a maritime issue, but the pirates (or criminals) also attack targets on land such as banks. But crime linked to the maritime sector is much more extensive; it also includes mutiny, stowaways, robbery, murder, and fraud. There are reports on slavery in the fishing industry.[74] It happens that ship-owners abandon their crew, generally multinational, in a foreign harbour without any resources. There is also an important traffic with waste which is dumped in poor countries or at sea. In 2006, the Greek tanker *Probo Koala* under a Panama flag discharged 500 m^3 of toxic waste in the harbour of Abidjan (Ivory Coast) with catastrophic consequences for public health. Sometimes a ship is scuttled in order to obtain insurance money. In the case of the Swedish S/S *Energy* in 1950, the culprits did not only sink the ship but also left the major part of the crew to drown.[75]

The piracy attacks off the coast of Somalia, have forced states to deploy relatively important naval forces for the protection of merchant and other civilian ships. The most well-known is the EUFOR ATALANTA, mentioned above, under the command of the EU since 2008. There have also been a number of ships from non-EU countries like Russia,



Main drug routes towards France.[71]

China, and Japan, etc. In this way the piracy attacks have had the advantage of fostering naval cooperation.

These operations are, on the other hand, expensive particularly as European countries have very limited resources. As a result, many ship-owners have turned to the private military market for protection. One of these, Sea Marshals Ltd, has, in fact, a small fleet of ships for this mission. This activity is controversial as it risks leading to a privatisation of naval warfare and also because of incidents such as when peaceful fishermen have been shot to death by private guards.[76]

Piracy and terrorism have different goals – earning money for the former and achieving political objectives for the latter – but there are strong links between them, not least regarding finances. As the 'crusaders' – we in the west – are so dependent on the sea, there are also great opportunities for terrorists in this arena.[77] This was clearly understood by the late head of Al Qaida, Osama Bin Laden. He is quoted to have said after the bombing of the French tanker *Limburg* in 2002 that: "By bombing the oil tanker in Yemen, the mujahidin struck the umbilical cord and the supplies for the Crusader nation's lifeblood…"[78]

In fact, in 2014 Al Qaida published a maritime strategy in its review *Resurgence*. Given the West's dependence on the flow of energy, the organisation calls for hitting Western oil and gas tankers in straits as well as refineries close to the coast. Towards 2025, this threat is deemed to be very serious and coastlines more exposed. Threats also on the high seas can, nevertheless, not be excluded.[79]

The number of terrorist attacks at sea – or via the sea – is so far relatively marginal in comparison with those on land. The reason is that attacks at sea require more skills and more logistics and human resources.[80] And, regrettably, attacks on land are terrible enough.

Nevertheless, recent history gives a number of examples on maritime terrorism. The most deadly attack so far was the one against Superferry 14 in the vicinity of Manilla in 2004: 116 killed. The attack against the American destroyer USS *Cole*, in Yemen, cost 17 lives in 2000 and it had a great political impact. Quite another kind of attack was the raid against Mumbai (Bombay) in 2008. Ten jihadists arrived by a highjacked fishing boat in the town where they killed 166 people, while more than 300 were wounded during the 72 hours of the attack.[81] In 2011, terrorists attacked the PNS[82] *Mehran* and a Pakistani naval base with the result of 18 persons killed, 16 wounded, and two MPAs[83] destroyed.[84] And in 2014, terrorists tried to take over Egyptian and Pakistani naval ships.[85]

On the coastline of a modern country there are a number of high-risk installations such as terminals for gas or chemicals as well as ports involved in the cruising industry. These are all potential targets for terrorists.[86]

The dependence on cyberspace and space-based assets for location, reporting, and logistics, etc., also implies a vulnerability regarding criminal activities. In 2011–12, the harbour of Antwerp was the scene of an important fraud in cyberspace. With the help of hackers, the criminals had been able to control part of the handling of containers in order to take over certain containers coming from South America. It has also been shown that it is possible to hack into the Automated Identification System (AIS) of a ship and, hence, change her registered position in order, for example, to avoid customs. Also, the navigation system GPS can be hacked. As modern ships are so dependent on computers for practically all activities linked to their navigation, it is also – or at

least will be – possible to take over a ship from a distance.[87]

The Daesh (also called the Islamic state) is, in contrast to Al Qaida, a territorial organisation. So far, it has not shown any maritime ambitions. Its branch in Libya, on the other hand, is reportedly interested in acquiring a maritime capacity in order to attack merchant and, especially, cruise ships. The conflict in Yemen may also spill over into a threat to shipping through the Bab-el-Mandeb strait.

A relatively new phenomenon – at least with regard to its importance – is the traffic of migrants from North Africa and the Middle East. Various schemes have been proposed to handle this crisis. Among other ideas, there have been those that the Search and Rescue (SAR) activities just increase the flow, and worse, are being used by the smugglers. This is probably so, but the obligation to save castaways is absolute and as long as the migrants are in peril at sea, they are castaways. Anyway, the number of people killed in one way or another is chilling.

Another serious maritime problem is illegal fishing. For obvious reasons, the exact numbers are difficult to come by but the yearly, global, and illegal catch represents at least 15 % of the total catch and 19 % of its value.[88] It is estimated that of the Chinese catch, 92 % is fished illegally while 71 % of the EU's is 'stolen'.[89] Illegal fishing is, hence, a huge activity. This activity also has a political impact as it tends to ruin fragile states that do not have the capacity to survey their EEZs; this is a particularly difficult problem in West Africa where nearly 40 % of the catch is illegally taken by ships from China, Korea, and Russia just to name a few. Looting has many consequences: it ruins local fishermen who might be forced to seek other, illegal, activities in order to survive.

The industrial fishing has a tendency to take all fish just to throw away those that do not represent a high value, in the end this will lead to the disappearance of fish in these areas. Another problem with industrial fishing – not only illegal – is that they scrape the seabed leaving behind a completely dead area. Illegal fishing is also heavily implicated in corruption in these fragile countries.[90]

The sea and the maritime forces

A navy will of course be a part of the armed forces but it is also part of the maritime world; it is dual in character.

The characteristics of a navy are very different from the other forces, with its 'brothers in arms'. An army unit will, in peacetime, be in its barracks when it is not engaged in exercises or operations abroad. It is only when the unit participates in operations that it carries all its weapons with munitions. There is no land on earth that does not belong to a state.[91] Hence, an army unit cannot cross the borders or build bases outside its own country without preliminary agreements. For an air force, the situation is almost the same.

A naval force, on the other hand, can stay at sea for a very long time. There, the force profits from the freedom of navigation meaning that it has the liberty to go almost where it wants. The only limit in this regard is constituted by the rules of innocent passage for the territorial waters of other states.

A naval force normally goes to sea with all its arms. It may, therefore, almost instantly change posture from peacetime to war. The variety of systems carried on board aircraft carriers, frigates, amphibious ships, and submarines supported by replenishment ships give a naval force great flexibility. Obviously, most navies do not have all these kinds of

ships, but most ships of the size of a corvette and upwards are inherently flexible. Furthermore, the command, control, and communications systems (C3) on modern ships as well as the capacity to replenish at sea give them a great deal of autonomy.

What is then the purpose of a navy? The sea itself provides it with a number of specific missions; it is a vector for action but also, in certain strategic cases, an obstacle.

The sea implies specific missions because the interests that are linked to it need to be protected. Its users need to respect the laws of the sea and the various maritime regulations. It is necessary to prevent the illegal use of the sea and to install a regime of safety and security. A naval force executes these maritime constabulary actions in peacetime (if 'peace' really exists in our world), in a crisis, and, as applicable, in war. However, states do organise these activities in various ways. Some use a navy for all of them, while others have a special coast guard for the more civilian missions. However, there will also be other forces involved like police, customs, or air forces. That is why we will use the term 'maritime forces' except when it is clear that the context is 'pure' naval warfare. Hence the term 'maritime forces' includes all kinds of forces, civilian or military, that take part in maritime missions.

The sea is a vector for action because it allows an unparallelled mobility to maritime forces. At sea, maritime forces can perform a range of missions from SAR via diplomatic missions to deterrence. From the sea, they can project power – missiles, air strikes, and gunfire, etc – as well as ground forces. But they can also deliver disaster relief and evacuate threatened citizens or wounded soldiers (MEDEVAC). The concept of Sea Basing, where the joint force is based at sea, is very interesting in this context as it reduces the need for large bases ashore and thus reduces its footprint.

However, during certain conditions, the sea is an obstacle. Hitler could never carry out operation "Seelöwe" – the invasion of Great Britain – because he could never establish sea control over the English Channel. Napoleon had the same experience with his flotilla in Boulogne in 1805. During the Cold War, from the point of view of Sweden, the Baltic Sea was a moat that offered protection against a possible Soviet invasion. The Pentagon uses the formula A2/AD, *Anti Access / Area Denial* in order to describe a strategy aiming at keeping a (potential) enemy away from one's shores.

The key issue is sea control – the ability to use the sea for one's own interests and deny this ability to the adversary whether the adversay is constituted by criminals, pirates, terrorists, or, in wartime, by a navy. Sea control is never absolute; it is local, temporary, and/or partial. During operation "Unified protector", against Libya in 2011, the forces of Gaddafi succeeded to lay mines in spite of the overwhelming superiority of the coalition forces. The flexibility and mobility of maritime forces make them important diplomatic actors both in order to deter and in order to acquire friends.

Corbett's definition quoted above – control of the sea equals control of the communications at sea – is still valid but is not sufficient. As we have seen, the state and its economy have a wide range of interests at sea that need protection and, of course, promotion as well.

Strategic missions

The maritime forces of a country need to carry out a broad range of activities. Some of them are primarily constabulary while

others are more military in scope; this is what makes them 'dual'.

A basic mission is intelligence and surveillance; to know what happens at sea. But this mission also includes the long term quest for knowledge about the sea and those who use it.

Prevention is to a large extent a diplomatic mission. The goal is to create a benign strategic environment. Common exercises, exchange of personnel, naval visits, and of course, presence at sea are activities within this mission. Prevention is also an important mission regarding the safety of all users of the sea and its environment as well.

Deterrence is not only a mission for submarines with ballistic missiles but a conventional mission. The purpose is to make a potential adversary understand that an attack would not be 'cost-effective'. This is done by being at sea with modern ships manned by well-trained personnel, thereby demonstrating capability.

Protection is a wide-ranging mission which covers both safety and security of all legal activities at sea in peace, crisis, and war.

Intervention, finally, could be the projection of power in war and crisis but also the active pursuit of criminals at sea, and, generally, to engage the forces of disorder at sea – criminals, terrorists, adversaries, as well as (potential) enemies.

The common denominator of these missions is the importance of presence at sea with maritime forces that radiates respect.

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