

The social sciences deal largely with human societies, but not exclusively. This indicates that societies are not exclusively human. The study of societies is unlike many aspects of science as it occurs in the physical sciences because it is often not possible to experiment the way one can in the physical sciences.

It is possible to organize the world along levels of complexity:

- Societies
- Organisms
- Organ systems
- Organs
- Tissues
- Cells
- Bio-molecules
- Molecules
- Atoms
- Subatomic structures

Typically physics deals with the lowest levels, chemistry is above that, biology a bit higher and geology tends to be more or less like biology but with inorganic materials.

We can look at the organization of things as levels of organization:

Sub atomic particles come together to make atoms, which combine to make molecules. Some molecules combine in such a way that they constitute bio molecules. These become sub cellular parts that can become cells which become tissues, that becomes organs and organ systems which make organisms.

At each level of organization some new attribute appears which does not exist at the lower level. So going from molecule to bio-molecule the characteristic of life appears. This is not a new idea. It generally contrasts with something called reductionism – If something is in the whole it must be in the parts. So we could ask under this idea “Are you alive?” If your answer is “yes”, then the next question would be “Is your circulatory system alive?”. If “yes”, then “Is your heart alive?” If “yes”, then “Is the muscle tissue on your heart alive?” If “yes”, then “Are the muscles cells in the muscle tissue alive?” If “yes”. “Are the sub cellular parts alive?” If “yes”, “Is the DNA in your cells alive?” If “yes”, is the carbon in the DNA alive”? Hmmm. If it isn’t then, non-organic material combined to make organic material. This is a QUALITATIVE leap rather than simply a quantitative one. In effect, each

level can be defined relative to something that appears at that level but not the one below it. There is an additive property involved.

It is also clear though, that what happens at a lower level can also have an effect on what happens at a higher level.

If we take hydrogen and put a lit splint in it, it will flare up.

It will do the same thing if you put a lit splint in oxygen.

If you combine hydrogen and oxygen you get water, and if you put a lit splint in water it does not explode or flare up, but goes out. So water does not behave like the elements which make it up.

At the same time we recognize that different atoms when combined will produce different molecules with different properties. Combining carbon and oxygen makes carbon dioxide not water. So there is something about the things which combine that has some impact on the higher level, but is still qualitatively different from the lower level.

So, while societies all share something in common, they can also be rather different in the same way that all molecules share something in common, but are uniquely different from one another.

In this sense, we can ask what is the "new" attribute that occurs at each level. At the moment our concern is about the level of organisms combining to form societies. We don't have a name for what the new attribute is that appears at that level. But we can say that whatever appears when organisms come together will be different depending on the organisms. When chimps come together in social organization, something "extra-chimp" will appear. The same will happen if the organisms are humans. We can use the term "culture" for the new attribute that appears when humans come together in social organization.

This is one "operational" definition of culture.

However, there are two ways in which "culture" is used. One is something we have just defined – something which is uniquely human, while the other is peculiar to a specific group. These are sometimes designated as "Culture" with an upper case letter for the universal meaning and "culture" with a lower case for a specific culture (e.g. Japanese culture, Navajo culture, Swazi culture and so on).

You can compare this with language as well. All human societies have Language (with an upper case "L") but specific societies have specific

languages (with a lower case "l"). So German is a different language than Japanese, both are "languages" so they share something in common which allows people to classify them as "Language". Similarly, some group A, has culture A; group B has culture B. A and B are not alike, but they share enough in common to be called "cultures" What they share in common is "Language".

So one definition of culture is "What occurs when humans come together in social organization".

This is a definition of "Culture" (upper case) whereas the specific form it takes in specific groups is "culture" with a lower case.

Culture can have variations in it the way there are different languages. There can be variations in cultures, the way languages have dialects.

A common definition of culture is shared learned behavior, although there are theoretical problems with this. Can there be a culture if only one person is still alive who practices it? Is this the same as a language existing if only one person speaks it?

Learned is contrasted with innate – a problem theoretically. Most comparative behavioral scientists stress the innate compounded and are "ethologists" like Konrad Lorenz. Others stress the learned approach (Skinner). Still others like Piaget are developmentalist. T.C. Schneirla on the other hand feels that the opposite of "learned" is not "innate" and so setting up these categories is problematical. Rather he sees things developing but in a different way than Piaget.

There are over 70 definitions of "culture" in the dictionary of the social sciences so you pay your money and take your pick!

Languages have a set of rules (often called grammar) which people have in their heads, but are frequently not conscious of.

All speakers of any language know how to make up sentences in that language.

One can think of culture as a set of rules like a grammar for the way to look at the world – how it is perceived and how one should behave.

In language, we know that sounds, words, phrases and sentences have rules. You can say "The man walks the dog" and other English speakers will understand you. You cannot say "The the man dog walks" and expect to be understood.

So what then are the parts that are involved in the nature of culture?

## WHAT IS THE NATURE OF CULTURE

Symbolism may be one of the main components. The nature of the symbol is x stands for y arbitrarily so different cultures may symbolize different things with the same symbol. It differs from "signs" in that signs have an actual relationship with the thing they represent. The word "dog" is a SYMBOL for the furry animal. It changes from language to language. If a dog steps in mud and leaves a foot print that is a SIGN of the furry animal. It does not vary from place to place.

Symbols however, can be abstract categories as well. Such concepts as "sacred" and "profane"; "private" and "public" are categories which cannot be located by physical tests in the real world, so they can be thought of as "symbolic" categories.

So at a societal level, various social organizations can be found, but there is also a symbolic level. Some social scientists think of an organizational part of society (social organization) is comprised of such things as family and other social, political and economic organizations and a symbolic area in "human societies". Even family units (including members can be thought of and classified in different societies). In some societies, for example, one's father and one's father's brother are called by the same term. This may strike English speakers as odd, but no odder than others see English when it classifies one's mother's brother as "uncle", the same term it uses for one's father's sister's husband! Other languages like Chinese have 5 different words for the English word "uncle" having separate terms for father's older brother; father's younger brother; mother's brother; father's sister's husband and mother's sister's husband!!

CULTURE Cultures are often divided into 2 parts – the areas dealing with social structure – everything from the family up to complex governments; and symbolic aspects – religion, ethics, belief systems folklore and so on.

In the early days of anthropology the anthropologists were very involved with evolution – it was the "spirit of the times". Lyell had postulated geological evolution, Darwin biological evolution and early social scientists were talking about the evolution of societies. Some of that is apparent in the

developmental sequences from hunting and gathering through horticulture to agriculture.

Agriculture (with plow)



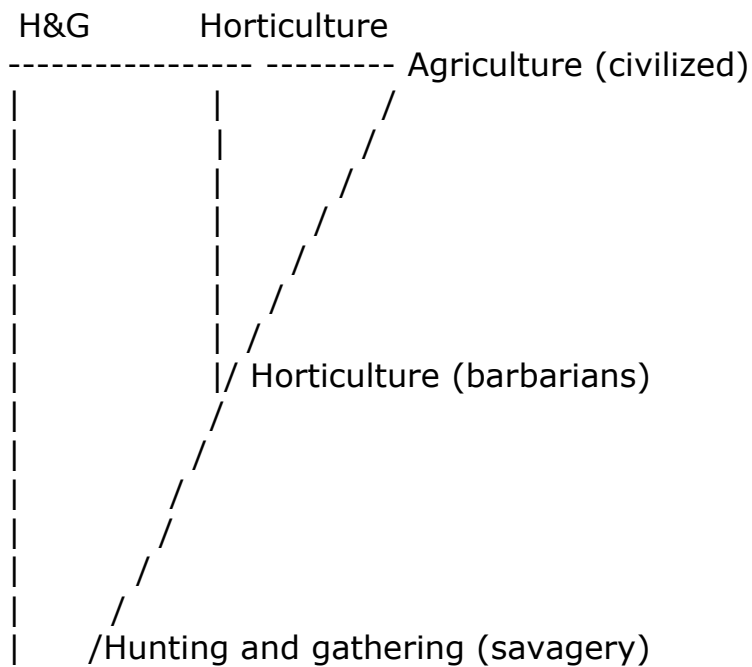
Horticulture (digging stick)



Hunting and gathering (bow and arrow, spears)



It was also felt that among some peoples, this development or evolution had not happened and so there were “survivals” – things that were held onto from the past so one could make a diagram showing this:



In general, Europe was seen as the apex of development (even to the point of requiring an alphabetic writing system so as to rule out Asia cultures which use either characters or syllabaries.)

We have considered some ways in which the oceans interact with people from the general term "blue economy" which involves all the kinds of revenue that is generated by the ocean. This includes recreational aspects of the economy (boating, jet skiing, life guards, dock workers, ship workers, oil rig workers, fishermen and even pirates etc.)

We also talked about things like the way the earth and atmosphere interact in things like weather whether it be hurricanes and storm surges, or El Niño (ENSO) and the like.

We also talked about the way the earth interacts with the ocean and the results of undersea earthquakes and volcanism.

But people also get positive things from the ocean such as food. This involves harvesting the organisms in the ocean whether they be invertebrates like mollusks, etc. through fish and whales.

While the ocean is a major primary producer and sequester of carbon dioxide and many other things of great importance, the two most important aspects of the ocean to people in their everyday life are transportation and a source of food.

No society in the world eats all the edible material around them (i.e. can be eaten for nutritional value and is not toxic). In the USA people normally don't eat dog or horsemeat and generally stay away from insects and worms and grubs

No society in the world seems to recognize human flesh as ordinary food, so cannibalism on a regular basis seem unknown although it does occur under conditions of extreme deprivation and ritually. Even in Western society, the eating of the body and blood of Christ during communion is an example of what has been called "symbolic cannibalism"

We get many foods from the ocean although the vast amount of food people eat comes from the land. As populations increase, they often seek to build on relatively flat land, which is also sought after for agriculture. So as populations increase and space to farm decreases there develop many problems. In effect, a smaller amount of land available for planting is being asked to produce more and more food. This often requires fertilizers to be used which then become involved in run offs to the ocean where the result is algal blooms leading at times to dead zones.



Mollusks



crabs





Lobster



seal



Tuna



Sperm whale

There was a time when people thought there were unlimited quantities of fish in the ocean. Not just fish, but all kinds of food items:



The Grand Banks were known for their “infinite” numbers of cod fish. People used to say they were so plentiful you could walk on their backs across the water. By 2000 they were nearly extinct.



Fishing has been practiced by humans for more than 100,000 years. It has generally been considered a "side production method" compared to the use of the land. After all people are land living animals and as a result tend to be more involved with plants and animals which are also terrestrial. The earliest humans got their food from a process called "hunting and gathering". In these cultures people act more as passive producers of food. They caught what animals appeared and gathered whatever vegetable matter was available.

After many millennia people began to become more active in food production and began to domesticate animals and plant crops. Initially this appears to have been a kind of small scale gardening done with a "digging stick". This level of food production is called "horticulture"

Following that people became more intensive in their production and began to raise animals for food and plant more extensively, using the plow. This more complex level is known as "agriculture".

Fishing and the use of marine life as food is generally ignored since many peoples do not live by the ocean, and those who do, may not venture to far out on it. So the food from the ocean contributes only a small amount to people's diet.

Some cultures are more involved with the ocean than others. Japan, for example, has little land for grazing. It is largely mountainous and what level land there is has been used for the building of cities. Japan, like Oceania (the Pacific islands – Polynesia, Melanesia, and Micronesia) has used the ocean the way that Americans have used the Great Plains. Both the Pacific cultures and Japan are very similar in that way. While they do grow food as well, there is much more use of sea food than there is say of the Cheyenne or Arapaho who live on the Plains in the U.S.

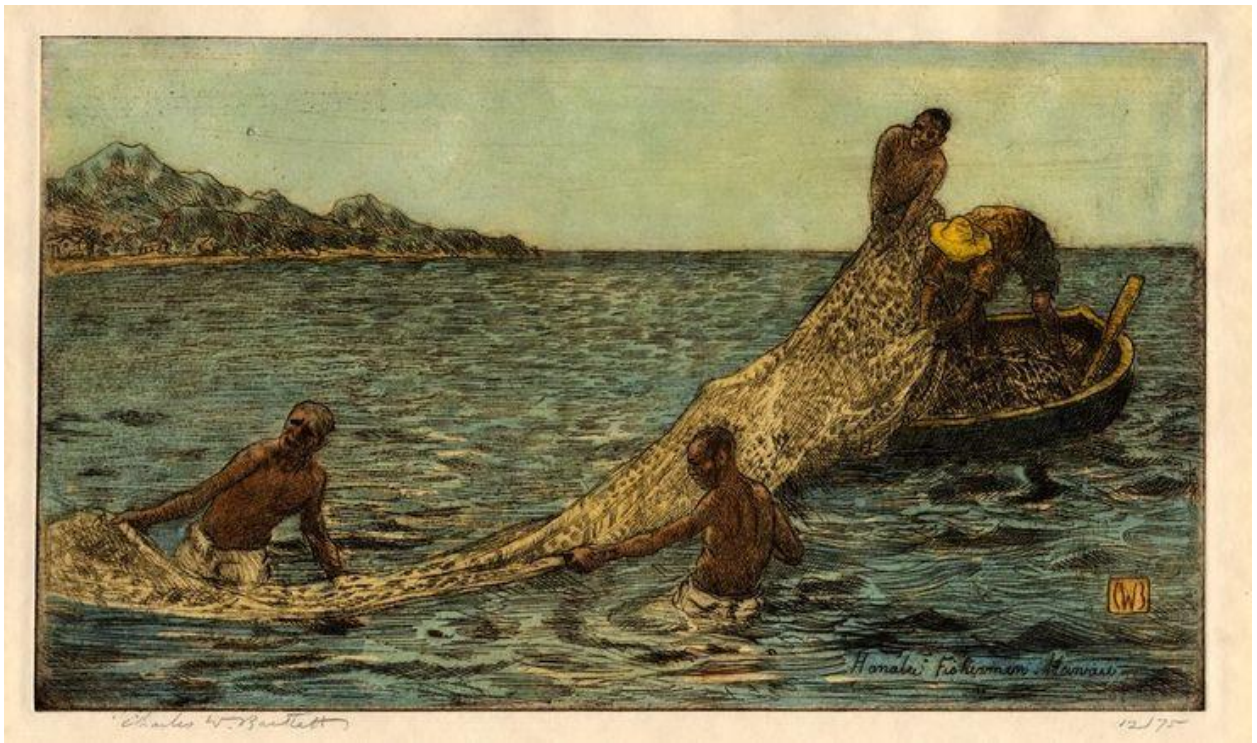
However, there has certainly been a similar development in fishing techniques among many people that in a sense parallels that of the people who have developed more agrarian economies.

One might start with the catching of fish either by hand or with a spear or a hook. These techniques generally involve catching a single fish at a time and basically "hunting" fish and "gathering" plant life or some sessile or near sessile animals.





Later people found ways to catch many fish at a time by constructing nets or building weirs. This is perhaps akin to "horticulture".



Finally, there is "fish farming" in which people actual build a kind of "fish pen" in which fish can be raised and in effect "farmed".

This last approach has developed a number of terms to describe it:

#### FISH FARMING:

Mariculture: Raising fish in the ocean (salt water)

Aquaculture: Raising fish in fresh water



In some cases this has been productive, but the fish are being raised in water which may be polluted in which case there can be problems with the fish. Another approach has been to raise fish in tanks where there are plants. The fish are raised in pure water with some nutrients added. The fish eat the plants which are also oxygenating the water. The fish produce carbon dioxide from breathing and excrete materials which nourish the plants. The plants photosynthesize and produce oxygen for the fish (along with food). The tanks become closed ecological systems. Fish raised in this way for food can be raised almost anywhere and as a result do not have to be transported great distances to land locked populations.



As populations of human grew and continue to grow, there is a greater need for food to feed the growing numbers of people. This has resulted in a number of changes on the ways in which people have dealt with the need for more and more food. On land there is a great deal of fertilizer used to produce more food from the same amount of ground (This parallels the problems of "efficiency" in which less human energy is needed to produce the same results, or the same amount of human energy is used to produce greater results (remember the spear, adl adl and the bow and arrow).

Earliest people did their fishing near the land. Fishing and navigation are tied together. You can sail out of sight of land and get fish, but if you cannot find your way back, it is meaningless.

About 40,000 years ago in East Timor Indonesia there is strong indication that people were traveling into deep waters out of sight of land and fishing.





Sites show large numbers of fish bones that come from tuna, a deep ocean fish indicating that people were traveling far out into the ocean and catching large fast moving fish. The technique is not known, but the number of the bones indicates that this was not an accidental catch of one or two tuna.



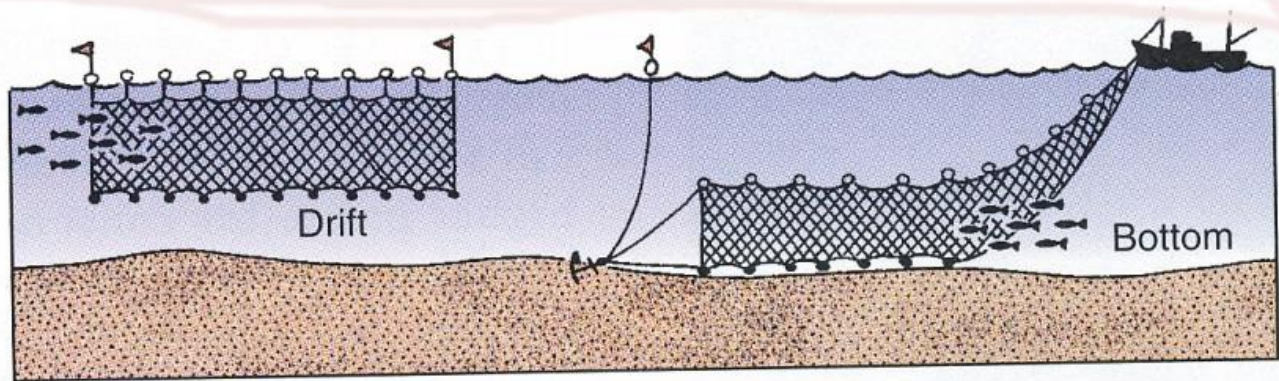
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*East Timor and the surrounding countries. The inset shows the composing territories: the mainland (with capital Dili), the enclave of Ocussi-Ambeno, and the island of Atauro. There's still the tiny isle of Jaco, unnoticeable at these scales, but that can be imagined as a dot in the easternmost of Timor. Across the Timor Sea, Australia is at about 450 km away, and Java 1000 km.*

More recently a number of techniques have been used for catching large numbers of fish. These are:

## Gill nets



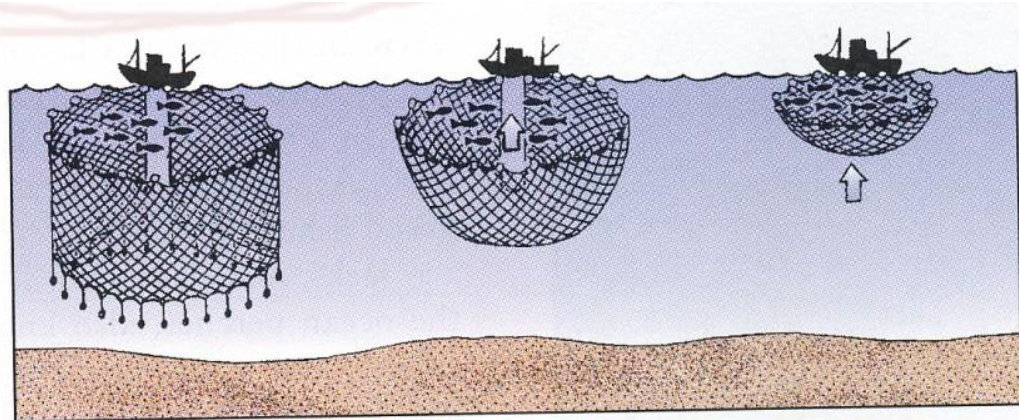
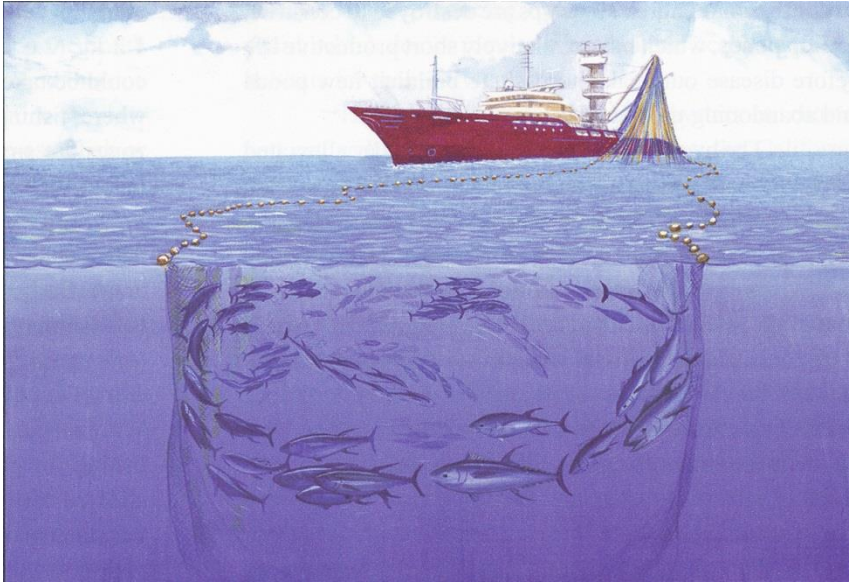
(a) Gill nets

Gill nets are not restricted to commercial fishing. They date well back to antiquity. The nets can be made with different size openings. The larger the opening, the larger the fish that is caught (that is smaller fish can swim through larger ones cannot).

Currently the size of the openings and the strength of the netting are heavily regulated. This is done to prevent some "over fishing" (taking too many of the same kind of fish) and trying to avoid catching many kinds of fish which may not be what is wanted (by catch)

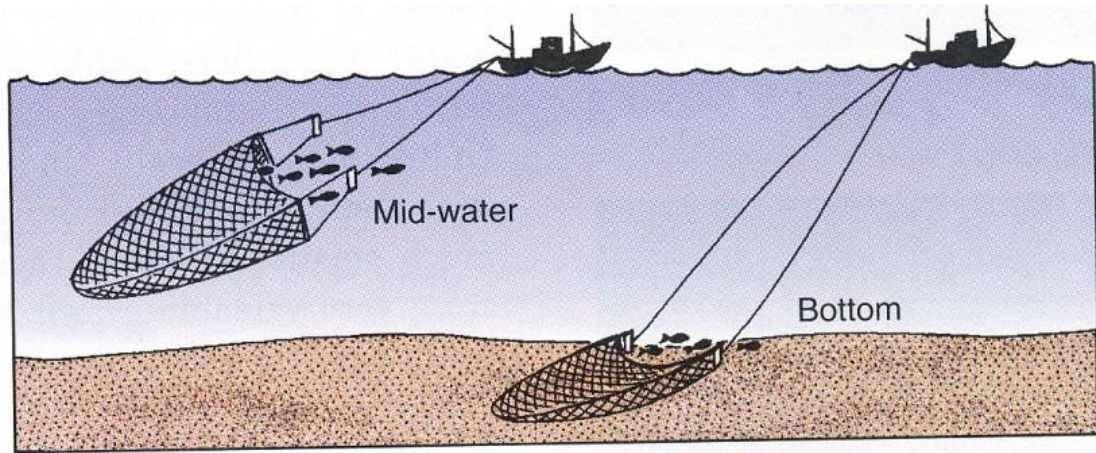
Some materials used in making nets is resistant to decay, and such equipment when it breaks loose, continue to "fish" even though there are no people to catch the fish and use them for food. This catching of fish by fishing equipment that has broken loose is known as "ghost fishing"

Purse seine



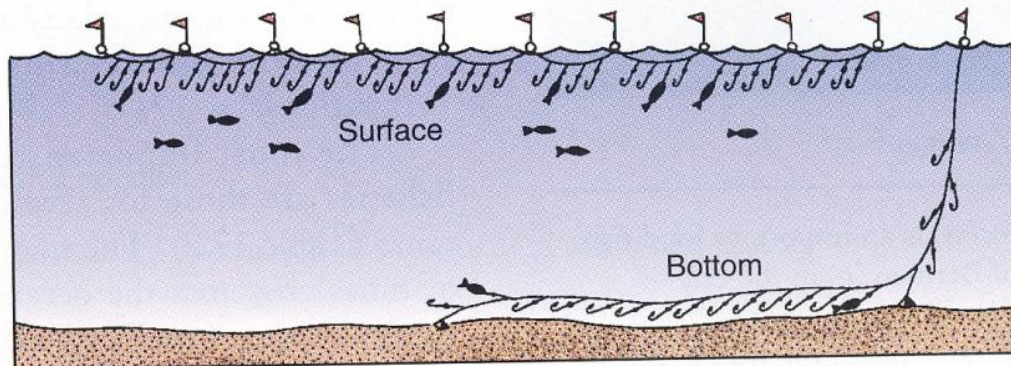
(b) Purse seine

Trawls



(c) Trawls

### Long line



(d) Longline

## TRAPS AND POTS

Baited cages usually attached to a line are used to trap the catch and keep it alive until the fisher returns after several days. (notice “fisher” here and “fish” refer not just to the biological category fish – a vertebrate, but to many invertebrates that live in the ocean). The traps are used for lobsters, crabs and shrimp (arthropods) as well as some bottom dwelling fish.



Gathering food from the sea involves not only nets and hooks, but lobster pods, crab traps, spears and harpoons. Harpoons are normally distinguished from spear points in that they have barbs so the point cannot be removed by the animal shaking it loose.

## SOME PROBLEMS WITH FISHING

Who owns the oceans????

There are a number of problems with fishing in the ocean since the oceans are “free”. But with a 200 mile limit now in use, more fish fall within the different countries’ borders and foreign vessels may try to fish there despite the laws.

In America, there were a number of problems with Russian ships trawling in American waters and destroying the ocean bottom, thereby upsetting the habitats of much marine life.