Dragon

$3.50

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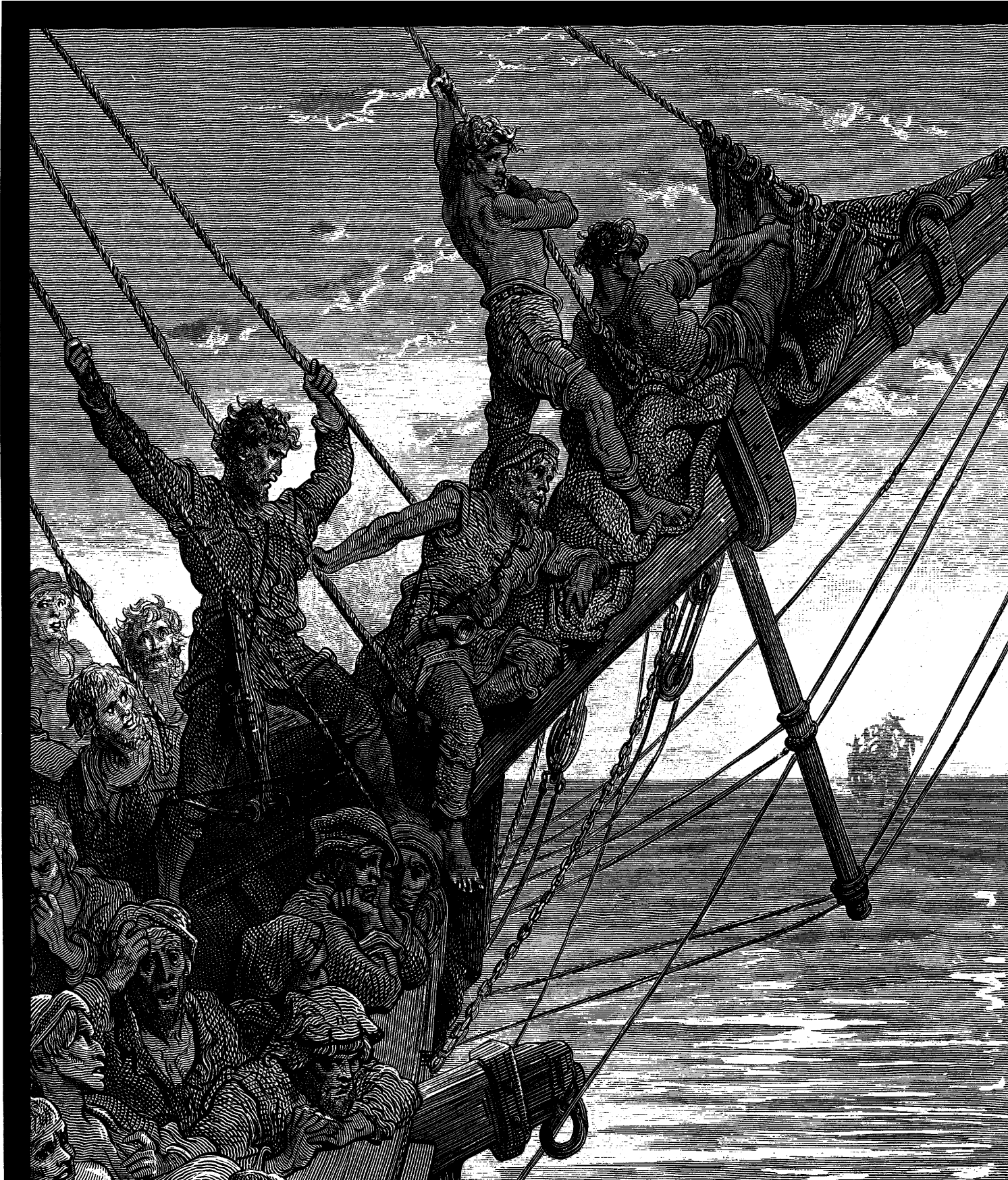
The High Seas
(and a 3-D sailing ship)
Wild animals
Doctor Who? (all six!)

MARITIME ADVENTURES

High Seas

Ships, fore and aft,
in fantasy gaming

by Margaret Foy

By far, ships have excited the imagination more than any other form of transportation. Odysseus, Horatio Hornblower, Sir Francis Drake, Captains Ahab, Nemo, Blood, and Bligh; the Beagle, the *Argo,* and the *Flying Dutchman* — the list of names goes on and on. Ships battle wind and wave, sea monsters, fate, and each other, and those aboard run the gamut from shining hero to basest knave. Ships have a way of stimulating the imagination, generating interest in the high seas and nautical adventure. This affection is no stronger than in the gaming hobby, where sailing miniatures and board games garner attention and reflect this preoccupation with the Age of Sail. Role-players who are thus afflicted may take heart. Now, one can satisfy two cravings at once: the desire for adventure on the high seas and playing the AD&D® game.

Much of this article is based upon information relevant to the Age of Sail up to the 19th century. However, there is no reason why an advanced nation of a fantastic world could not produce ships much like the "big sail" craft popular during that era. Sailing ships should evolve in magical worlds as they have in our technological one.

Nautical terms and definitions

Some nautical terms need to be introduced. For purposes of this article, a galley is any vessel that is rowed and sailed. A ship is a sailing vessel, pure and simple. The rear half of a vessel is the aft, and the front half is the fore. The fore part is the bow, and the aft part is the stern. If one is facing the fore, the left side is port or larboard, whereas the right is starboard.

In order from fore to aft, the masts on a sailing ship are called the fore, main, and mizzen masts; on a two-master, they are the main and mizzen masts; and, on a four-master, they are the fore, main, third, and mizzen masts. A square rig has square or rectangular sails hanging from the crosspieces on the masts (the crosspieces are called yards or yardarms). On a fore-and-aft rig, the sails are shaped like a right triangle. One apex of the triangle is attached to the mast and another to a traverse beam from the lower mast called a boom. A lateen rig uses very large sails shaped like a right triangle. The hypotenuse side of a lateen rig's sail hangs from a very wide yard, and the sail is loose-footed — that is, without a boom at the bottom. A square rig gives a vessel quite a bit of power, but requires many sailors to operate. The fore-and-aft rig requires fewer sailors and is more maneuverable, but delivers less power to the ship. The lateen rig is midway between the two, both in terms of power and number of sailors required to handle it. The masts are braced by sets of heavy cables called the standing rigging, while the ropes used to manipulate the sails, yards, and booms are called the running rigging.

The lowest space inside the ship is the

hold, where the cargo and supplies are stored. Above the hold is the orlop deck, where there are more supplies, the hearth, and the crew's mess tables; it is also where the wounded are put during battle. Above the orlop deck are the lower, middle, and upper decks. The crew sling their hammocks on the lower and middle decks, and on the orlop deck when the ship is very crowded. Light, medium, and heavy mangonels (small catapults used at sea in the 11th and 12th centuries) are emplaced on the upper, middle, and lower decks, respectively. Not all vessels have a full number of decks; very few do.

Aft of the mizzen mast, over the upper deck, is the quarterdeck, which roofs over the space where the officers and some petty officers have their quarters. Fore of the foremast, over the upper deck, is the forecastle, where the rest of the petty officers sleep and mess. Between the two partial decks, the open area of the upper deck is called the waist, in which the ship's boats are stored. Over the quarterdeck is the smaller poop, and over that is the even smaller poop royal.

The medieval ships (cog, carrack, caravel, galleon) were built high-charged, meaning that wooden towers were added to the hull after the ship was finished, making them top-heavy. Later, these wooden "castles" were built as part of the hull, but the ships had only one or two full decks. High-charged ships were top heavy and liable to capsize. Low-charged ships added full decks, limited the number of partial decks, and had a deeper draft (the distance from the waterline to the keel); thus, their center of gravity was lower.

Ship personnel

At the bottom of a vessel's hierarchy is the landsman (landswoman, -elf, or what have you). This landlubber has no nautical experience at all and requires four to six months of training to become an ordinary sailor. An "ordinary" has no special skills, but can go aloft in the rigging to handle the sails, and on a galley he can be trusted to follow most commands. After a year of training, about half of the ordinaries become able-bodied sailors (ABs). ABs can make repairs and splice ropes, and know all the knots; in short, they now "know the ropes." On a galley, they are also the lead rowers, whose actions give the cues to the ordinary sailors. Mates, or assistants to petty officers, are ABs who have special skills. On a galley, the mates are spaced out among the banks of oarsmen, since they set the tempo for the other rowers.

The petty officers and their mates are as follows: The bosun (or boatswain) and the bosun's mates are in charge of various odd supplies and the ship's daily maintenance. The master-at-arms has charge of the ship's weapons locker, training the crew in combat and administering discipline. The sailing master navigates the ship and teaches navigation to the master's mates and the middies. A quartermaster is a very

junior master's mate who takes the wheel and steers the ship. Midshipmen (middies) are petty officers in training to become lieutenants. Middies supervise work parties of sailors and do anything else a lieutenant tells them.

The previously mentioned petty officers are in the chain of command (COC), which indicates who is to take command of a ship when the captain is killed or incapacitated. The proper order of the COC, descending in rank after the captain, is: lieutenants, middies, the sailing master, master's mates, quartermasters, the bosun, and finally, the master-at-arms. If the master-at-arms dies or is incapacitated, the COC is exhausted and the command is up for grabs (and so is the vessel, usually).

There are other petty officers and mates not in the COC: the cooper, sailmaker, cook, carpenter, purser, and their mates. All petty officers report to the first lieutenant except for the sailing master, who reports directly to the captain. On small vessels, the petty officers report to the sailing master or, if there is none, directly to the captain. Petty officers are sometimes called warrant officers.

The lowest-ranking commissioned officer is the lieutenant, the most senior of whom oversees the daily operations of the vessel. Lieutenants frequently command cogs, cutters, or brigs. In rank above a lieutenant is the commander, usually commanding a caravel, brig, or corvette. Next highest is a captain who, for the most part, commands a carrack, a frigate, or a ship of-the-line. A commodore is the captain of his own ship and commands a squadron of two to eight vessels. The various types of admirals command larger squadrons or fleets, but never a vessel. Even an admiral's flagship is commanded by its own captain.

Regardless of actual rank, the person commanding a vessel is called Captain. When introductions are used in conversation, use the following form: Lt. Alex, commanding the cutter Valiant. Any officer of the rank of captain who is not in

command of the vessel is referred to by the title of the rank one step higher than captain. This courtesy promotion is used to avoid having more than one person addressed as Captain aboard a vessel.

Marines have their own officers and command structure. Their highest officer reports to the captain of the vessel. Their use on vessels is twofold. Firstly, they provide small missile fire from the decks or fighting tops (the small platforms at the top of the masts). Secondly, they fight boarding battles. The crew and petty officers of the vessel load and fire the artillery engines.

Large vessels also carry a third group of auxiliary officers. These are specialists or spellcasters, and their chief officer reports to the captain. An officer may also be a spellcaster.

The system herein can be used with all the official character classes outlined in the *Player's Handbook* and *Unearthed Arcana.* The ship's complement as given in this article is not an attempt to introduce a new character class. Middies, quartermasters, and all the rest are the titles of positions. If a DM wishes to use the mariner NPC from DRAGON® Magazine issue #107 ("For Sail: One New NPC," by Scott Bennie) with this article, he should have no problem. Use the appropriate level of mariner for each position on the ship, complete with their special abilities, but ignore the various effects of crew ability. Vessels' statistics as given in the mariner NPC article are not compatible with this article. If you decide against the use of the mariner NPC for an entire vessel's complement, it is still recommended that the mariner be used for officers — especially the sailing master, master's mates, and the quartermasters.

A typical ship's personnel may be assigned levels as follows: landsman 0, sailor 1, mate 2, petty officer 3, sailing master and lieutenant 4, commander 5, captain 6, commodore 7, admiral 8 and higher. Aboard rowed vessels, the oarsmen are either zero or 1st level.
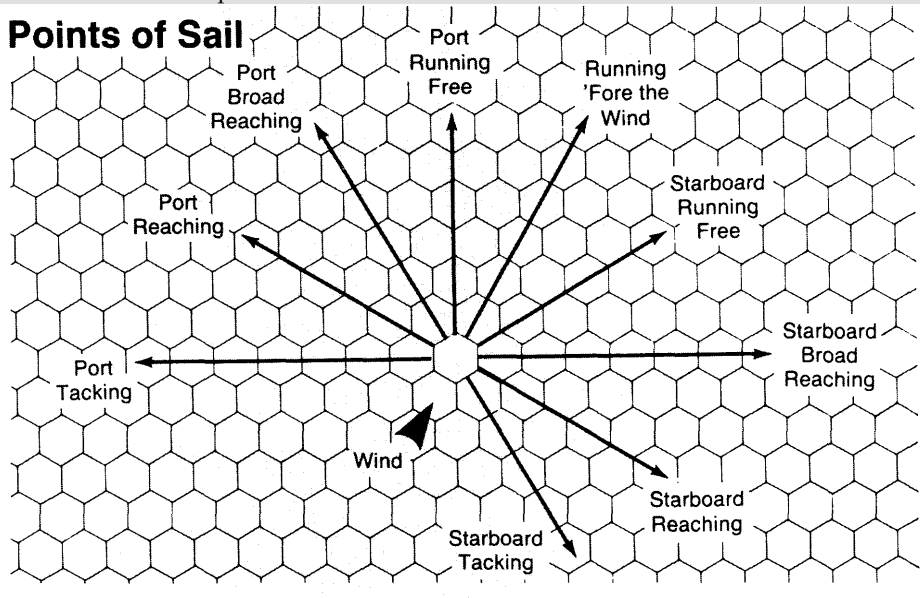
Points of Sail

Ship types and functions

The earliest European ships built solely or war were galleys with prows length- ened to form a ram. The galley that of- fered the best combination of speed, maneuverability, and offensive ability was he trirene. Its career lasted from the fifth century B.C. to the fourth century A.D. The trireme had three banks of oars with one rower per oar. These galleys were undecked (aphract). By 300 B.C., triremes were often cataphract — that is, decked. A later galley with a long career was the quadrireme.

The hemiolia was a galley used exclu- sively by pirates. The lower bank had 12 oars and the upper 13 (one rower per oar). The triemiolia, banked and oared as a trireme, was developed to chase pirates. Both could be rowed and sailed at the same time. The hemiolia's aft six pairs and he triemiolia's aft 15 pairs of upper oars could be quickly shipped and the benches cleared away. The rowers were then free to lower and store the sail, unstep the mast, and arm for a boarding battle. Both

ships were aphract.

Ancient galleys suffered from three major disadvantages. Their low freeboard and light construction made them unlikely to survive a storm in the open sea. They lacked cargo space; they had little room to carry water or food, let alone space in

which to cook, and they had little room in which to sleep. Fortunately, their con- struction allowed them to be beached easily. Another bright spot was that they could be portaged easily. An ancient galley could be portaged on rollers by its crew 2 1/3 miles a day. But the greatest disadvan-
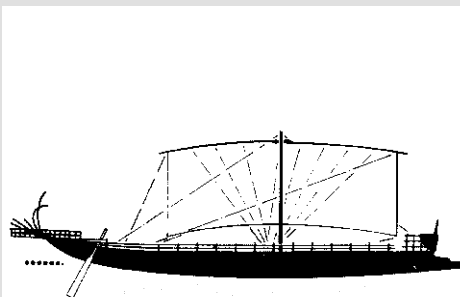
Galley
(5th Century B.C.)
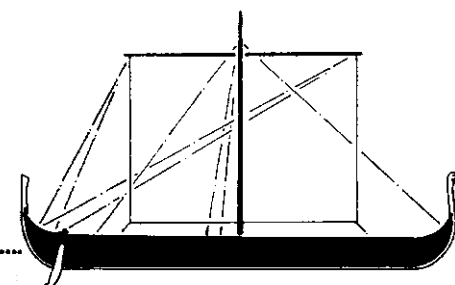
Longship
(10th Century)

tage of the fighting galleys was the crew. Galley crews had to be highly trained to work together. The crews were large, and they had to have a high morale. For the galleys that relied on ramming to win their battles, the crews had to be of very high quality. But the galleys that relied on marines to win boarding battles could operate with average or poor crews. The ancient navies never used slave rowers; despite Hollywood history, that practice didn't arise until the fifteenth century A.D. In desperate circumstances, even slaves would be freed if they volunteered.

Aphract galleys used the ramming strategy. At the beginning of a battle, the galleys would work up to battle speed and attempt to ram an opponent straight amidships. If successful, the rammer would immediately row backwards to disengage its ram; otherwise, the ram could be lost. The crew and marines on the rammed ship attempt to grapple the rammer to board and take it. Even if a ship missed in its attempt to ram, it might succeed in running along the side of its opponent and breaking off its oars. This required the raking galley ship to take in its oars before the attempt to rake.

Cataphract galleys grappled their opponents; then the marines fought a boarding battle. A naval engagement often developed into a large raft of boarding battles. Two devices were introduced to assist in boarding. The corvus was a bridge 36' long and 4' wide carried upright in the bow on a swivel mount. The far end had several spikes on the bottom. When an enemy galley was close enough, the lines holding it up were cut, allowing it to fall and spike itself to the enemy galley. The harpax was an iron-bound ballista missile with several lines attached to a winch at one end and a grappling iron at the other. The idea was to grapple and winch in an enemy. Pots of flaming oil were carried at the end of long poles that extended from the bow and sides of the galleys.

The drakkar or Viking longship was a very different sort of vessel. Unlike the ancient galleys that were built like racing shells, it had a true keel and was clinker built (like shingles), giving it strength and

Ship Diagram
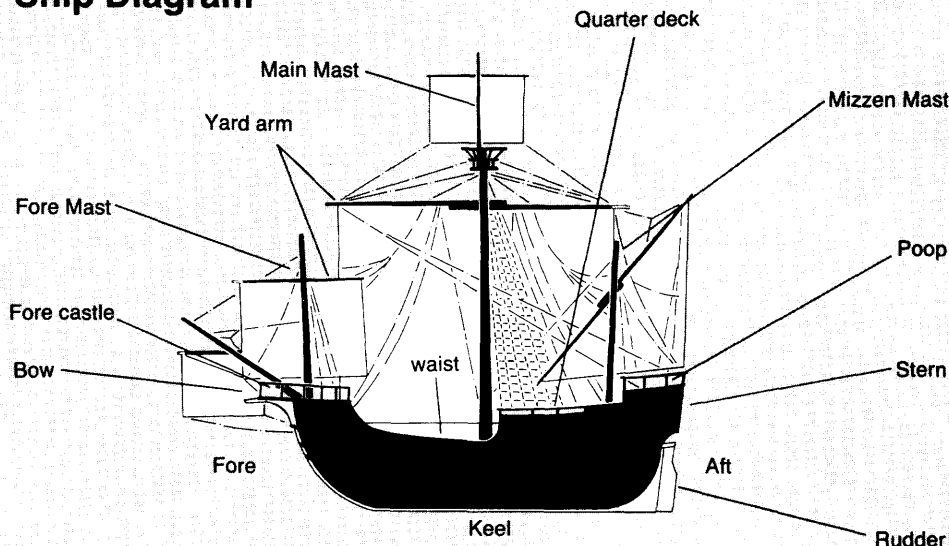
flexibility. The oars were used to row up rivers and maneuver in tight passages. Since they had no rams, drakkars fought each other by boarding battles. River galleys were used not only on rivers and lakes, but also in sea ports for patrol.

The cog was a European ship of the 13th and 14th centuries. The rear castle was square, and the forecastle was triangular. Both were raised platforms added to the structure of the hull. The cog continued its career in the Mediterranean in a lateen-rigged form for another century.

The caravel was a ship of the 15th to 16th centuries. It averaged 70-100' in length and was surprisingly seaworthy and fast. Its low draft made it excellent for trade without the benefit of ports (and for smuggling). Both the *Nina* and the *Pinta* were caravels.

The carrack was the first European ship to carry artillery and guns. Before then, naval battles were land battles fought on planks. The carrack's career lasted from the 15th to mid-16th centuries. The cog, caravel, and carrack were all general-purpose ships, used as warships, merchantmen, and pirates.

The galleon was a warship of the 16th through 17th centuries. Later, it was four-

masted and carried up to a hundred guns. It was the final development of the high-charged ship. The galleon was slow, not very maneuverable, and prone to capsize (as were all high-charged ships).

Cutters and brigs were customarily used in coastal duties to fill out a blockade and carry mail, dispatches, or official passengers. The corvette, or sloop-of-war, was the fastest ship of the time, but it was not as well armed as the frigate, Corvettes could be used as convoy escorts, as squadron ships, and as pursuit ships in blockades and against smugglers.

One third to half of the navies of the 17th and 18th centuries was composed of frigates. The frigate was the workhorse of the navy. It was well armed, maneuverable, and not as slow as ships-of-the-line. In fleet battles, frigates sailed to one side to repeat the admiral's orders and tow away heavily damaged ships. Frigates were also used as fleet scouts, convoy escorts, blockade and squadron leaders, and spies against enemy ports.

The largest fighting vessels of the mid-17th to mid-19th centuries were the ships-of-the-line, rated first to fourth. First rates generally stayed in home waters to protect important sea ports and coastal facili-
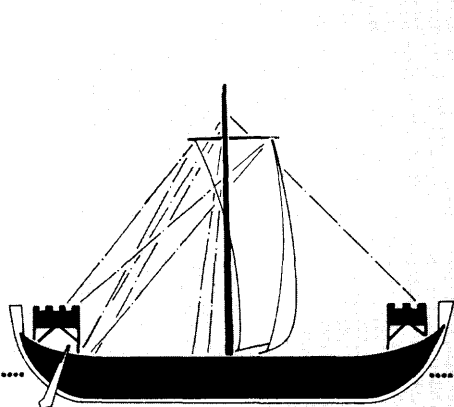
Warship
(13th Century)
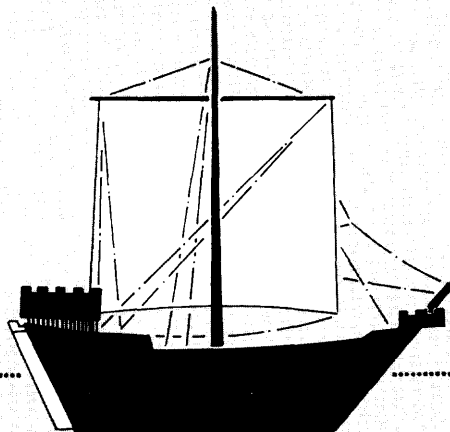
Cog
(13th Century)
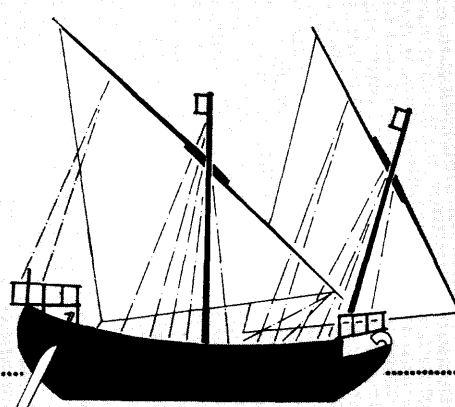
Merchantman
(13th Century)
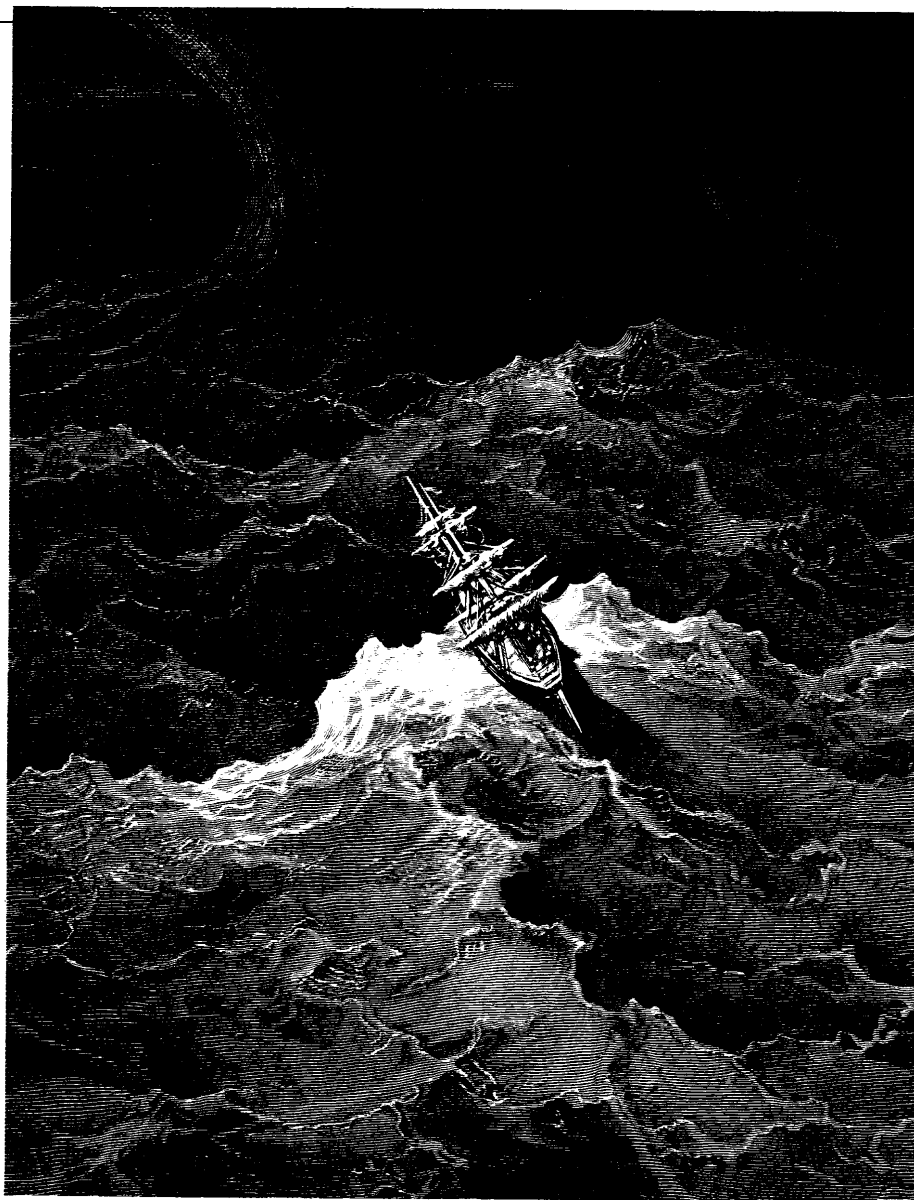
And now the STORM BLAST came, and he
Was tyrannous and strong:
He struck with his o'ertaking wings,
And chased us south along.

With sloping masts and dipping prow,
As who pursued with yell and blow
Still treads the shadow of his foe,
And forward bends his head,
The ship drove fast, loud roared the blast,
And southward aye we fled.

From "The Rime of the Ancient Mariner"
by Samuel Taylor Coleridge

Illustration by Gustave Doré.
courtesy of Dover Publications, Inc.
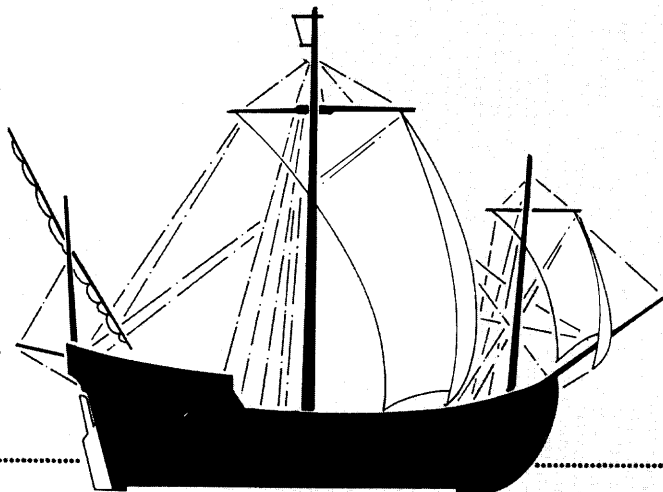
Caravel
(14th Century)
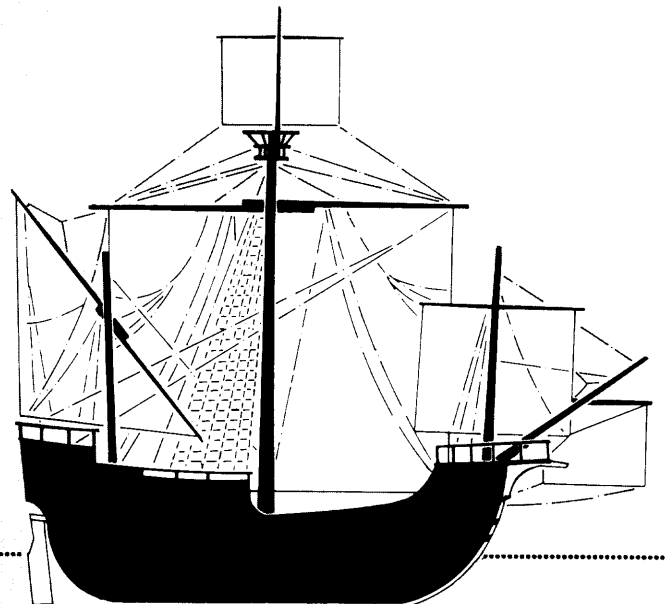
Carrack
(15th Century)

ties. Second rates were usually admirals' flagships. Third and fourth rates were often assigned to senior captains. These ships made up the bulk of a fleet, but not the majority of a navy. They cost a lot.

Naval transports and their commercial counterparts were slow, unwieldy, and nearly defenseless. As such, they were always escorted. Navies used them to carry troops, horses, supplies, weapons, and ammunition. Commercial transports carried bulky and heavy cargoes: grain, cattle, stone, ore, metal ingots, etc.

Cutters, sloops, and schooners were used mostly for fishing, trade, and carrying passengers. The fastest commercial ship was the clipper, which carried passengers and cargo that required great speed. Passage on a clipper often ran high (500 gp would be reasonable in AD&D game terms), and cargo rated up to 25% of the assessed value for bulky loads. The second fastest were the packets, which usually carried passengers or mail. In times of war, many navies commissioned packets to carry military mail and dispatches. The small, medium, and large cargo ships were generic merchant ships of the 16th to mid-19th centuries.

The difference between the roles of warship and merchantman are clear, but the difference between a pirate, buccaneer, and privateer can be very blurry. For our purposes here, a pirate is one who unlawfully molests, threatens, fires upon, detains, of harms a vessel or those on it. A buccaneer is a pirate who does not harass the ships of one particular nation — generally the nation whose ports the buccaneers are using. Obviously, one country's buccaneer is another's pirate. A privateer is a ship that has been awarded a letter of marque by a government. The letter specifies which ships are fair game and for what reasons. Governments issue fetters of marque to harass an enemy's shipping in war time and in peacetime to suppress piracy and smuggling.

Once a privateer has captured a prize, it must brine or send the captured ship to a port in the country issuing the letter. There, a Prize Court determines if the prize was covered by the letter; if it was, the ship and its cargo are then auctioned. The government has the right to buy the ship for itself before auction. The privateer keeps 75% of the price and the rest goes to the government. Naval ships also go through the same procedure with their prizes. Historically, the arrangements for dividing the spoils varied with country, custom, and ship.

Mangonels

Mangonels are direct-fire artillery engines that use small, round stones of lead shot for ammunition. They are powered by torsion, either from twisted thick ropes or heavy metal springs. Mangonels are used since arced fire was generally not possible aboardship. An arced artillery engine inflicts damage on two targets: the ship

Turns

Hard to Port
to Port
to Starboard
Hard to Starboard

Backwaters

Backwater to Port
Backwater
Backwater to Starboard

Galley Movement

Permitted Angles of Ramming
Shearing
Shearing
Permitted Angles of Ramming
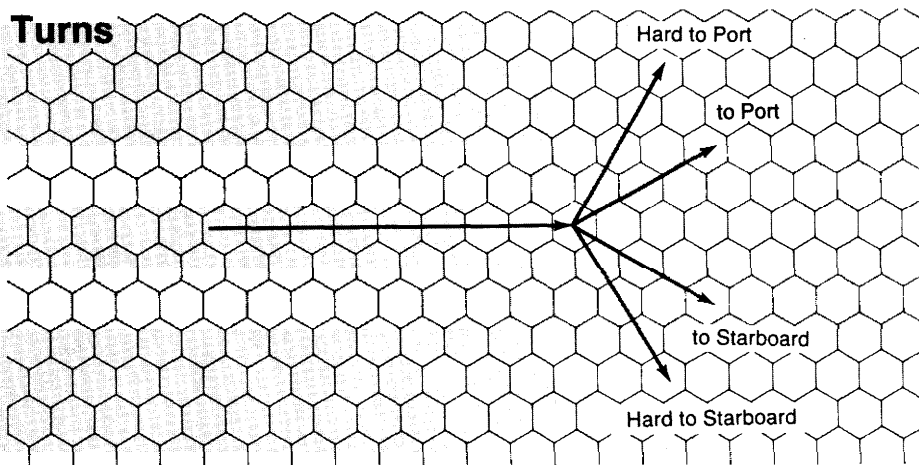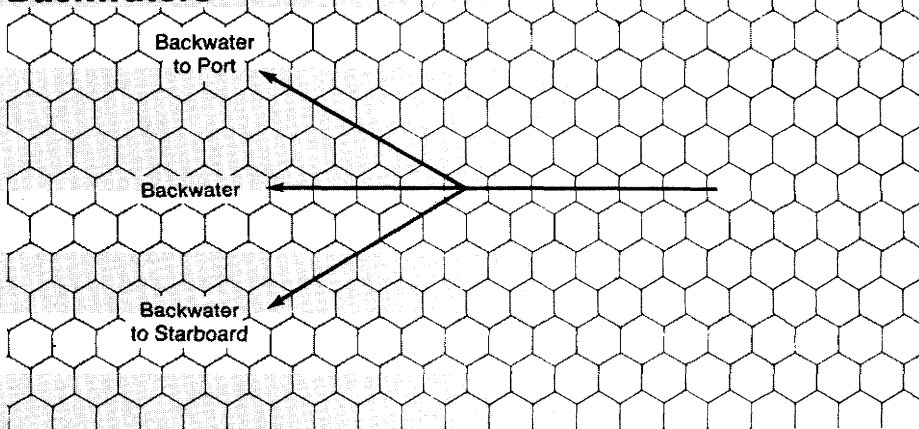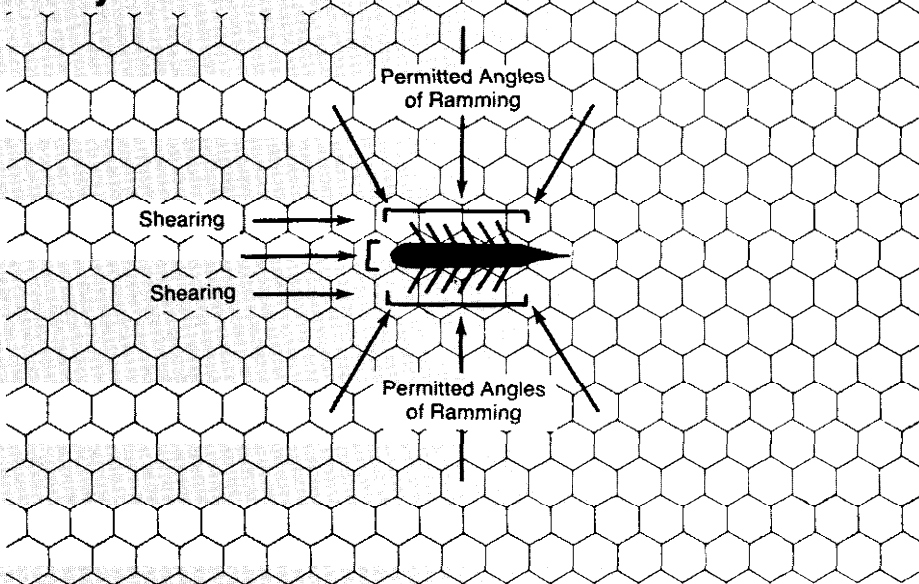
1 hex = 10 yards (1" in AD&D® game scale)

Type of mangonel	Damage		Crew			Field of fire	Rate of fire
	S-M	L	min	max	Range		
Light	2-16	3-12	2	4	¼-30"	5°	¼ or ½
Medium	3-24	4-16	4	8	¼-28"	5°	¼ or ½
Heavy	4-32	5-20	6	12	¼-26"	5°	¼ or ½

fired upon, and its own rigging and sails. The stress from a catapult would break a galley. Mangonels are subject to the same bonuses and penalties applying to other artillery engines (see page 109, *DMG)*

Table descriptions

Table Ia gives basic information about each kind of galley and ship. Cost is for a new vessel of acceptable maintenance with its masts, yards, rigging, and sails, but not with artillery engines, supplies, or spare parts. Vessels of good maintenance cost an additional 5% excellent 15%, and vessels of advanced design cost an additional 30%. Thus, an acceptable corvette costs 45,000 gp; a good one, 47,250 gp; an excellent one, 51,750 gp; and, one of advanced design, a whopping 58,500 gp!

Full length is from the bowsprit to the stern (taffrail), while deck length is measured on the uppermost full deck. Beam is the width of the vessel, and (middlemost) deck width is 2-3' less. Draft is the depth of the keel below the water.

Freeboard is the distance from the uppermost full deck to the water; in galleys, this distance is measured from the lowest oarlock. Both draft and freeboard are given far a vessel at its maximum tonnage, which is how much weight a vessel-can carry safely beyond the weight of itself, its masts, sails, rigging, and yards. If the vessel operates in fresh water, subtract 5% of tonnage since fresh water is less buoyant than salt water. Decks are added in the following order: (full) upper, orlop, lower, middle, (partial) quarter, forecastle, poop, and poop royal.

Galleys and ships may move in one of five directions in relation to the wind in which they can sail —four of these are for both port and starboard (e.g., port tack and starboard tack). The base speeds of the vessels may be adjusted by various factors. Vessels can sail at less than their calculated actual speed; this is simply a matter of spilling wind from the sails or of reducing the amount of sail set. On the open sea, ocean vessels sail all day and all night long. In AD&D game terms,

a mile is 176" long; thus, 3" is roughly equivalent to 1 MPH. Ships tacking on the open sea or ocean sail for several hours on one tack before switching. All movement can bediagrammed easily on hex paper, with 1 hex = 30 yards (1").

The numbers under maneuverability refer to which type of dice are rolled to determine how many rounds, plus or minus adjustments (See Tables II and III), it takes to change from one point of sail to another. This reflects time spent adjusting the sails, yards, and rigging. When maneuvering from one tack to another, the adjusted roll is tripled.

Table Ib is concerned with the fighting ability of the ships. The numbers given for defensive points can be adjusted by plus or minus 1-10% to allow for some variation within each type of ship. The emplacement of mangonels was mentioned above. Ballistas are mounted on the partial decks or on the upper deck, if there are no partials. The ship's complement is broken down into several groups. Commisioned officers are lieu-

Table Ia: Ships' statistics

	Size	Cost gp)	Full length (ft)	Deck length (ft)	seam (ft)	Draft (ft)	board (ft)	Tonnage	No. Masts	No. decks	No. partial decks	No. pumps	No. boats	Base speel (")	Maneuver-ability (sail)
Trireme, aphr.	M	4	115	0	12	3	4	50	1	0	0	0	0	9	10
Trireme, cata.	M	5	125	105	23	4	8	65	1	1	0	0	0	6	10
Quadrireme	M	25	180	155	26	5	10	320	1	1	0	0	0	6	10
Hemiolia	S	10	80	0	10	3	3	25	1	0	0	0	0	9	8
Triemiolia	M	3	90	0	12	4	4	35	1	0	0	0	0	12	10
Longship	L	30	120	100	27	8	6	425	1	1	0	0	0	24	8
River galley	S	2	60	50	15	5	3	50	1	0	0	2	0	15	6
Boat	VS	1/2	30	0	10	3	2	10	1	0	0	0	0	15	4
Cog	M	5	100	85	20	10	10	150	2	1	2	2	2	24	10
Caravel	M	13	85	75	20	7	7	100	3	1	2	2	2	30	10
Carrack	L	18	120	100	20	11	12	685	3	2	2	4	2	21	12
Galleon	L	20	135	120	35	17	20	1050	3	3	3	5	4	18	12
Naval cutter	M	15	100	90	22	6	5	190	2	1	1	2	2	24	6
Brig	M	30	100	90	25	10	6	250	2	2	2	3	2	21	8
Corvette	M	45	115	100	25	10	8	270	3	2	1	3	3	30	8
Frigate	L	60	140	120	34	15	10	610	3	3	2	4	4	27	8
SOL IV Rate	L	75	160	140	40	18	13	990	3	3	3	4	5	18	10
SOL III Rate	L	90	180	160	45	24	19	1460	3	4	3	5	5	15	10
SOL II Rate	L	105	200	180	52	27	22	2100	3	4	4	5	6	15	10
SOL I Rate	VL	120	230	200	57	30	25	2865	3	4	4	6	6	12	12
Naval transport	VL	65	230	200	60	35	20	3140	4	V	V	6	3	12	12
Cutter, small	S	3	60	50	14	10	7	40	1	1	0	1	1	21	6
Cutter, medium	M	5	80	70	19	10	7	110	2	1	0	2	2	21	8
Sloop, small	S	2	70	60	16	10	8	65	1	1	1	1	1	27	6
Sloop, medium	M	4	100	85	23	10	8	195	2	1	1	2	2	27	8
Schooner, medium	M	7	100	80	22	10	8	190	2	2	1	2	2	24	8
Schooner, large	L	14	115	100	27	10	8	310	3	2	1	3	3	24	10
Packet	L	50	140	120	24	13	10	320	3	2	2	3	3	33	8
Clipper	VL	100	220	200	33	15	5	1040	3	2	2	4	4	36	10
Cargo, small	S	25	115	100	30	15	10	390	3	1	1	2	2	21	6
Cargo, medium	M	40	140	120	35	15	10	675	3	2	2	3	3	18	8
Cargo, large	L	55	170	150	45	15	10	1325	3	2	3	4	4	15	10
Cargo, transport	VL	60	200	175	60	25	15	2660	4	V	V	4	3	12	12

V = Variable. Note that historical ships often varied widely from these given statists, which are for AD&D game purposes only.

tenants and higher. Petty officers and mates (group I) are in the COC. No ship has more than one of each petty officer in group I except middies. Petty officers and mates of group II are not in the chain of command. Sailors are able-bodied, ordinary, and landsmen.

The prevailing practice on a ship is to divide the complement into two watches, Each watch stands three shifts on, then three shifts off. A day is divided into five four-hour shifts and two two-hour shifts (the dog watches). Half of the normal complement is necessary to sail the ship; in combat, the off-duty watch handles the artillery engines, makes repairs, and puts out fires.

Maximum additional complement tells how many marines, auxiliaries, additional sailors, or officers a ship can carry. On commercial transports, the additional complement are passengers (troops on naval transports). In both instances, the transports have four full decks.

Table Ic gives additional statistics for galleys. A bank is a line of oars ex-tending from fore to aft. Normal oar speed can be maintained for up to four hours. Battle speed can be maintained for 60 rounds, and sprint speed for only 30 rounds. All require one hour of complete rest after the maximum time is expended. Every round of battle speed is equivalent to four rounds at normal speed; each round of sprinting is equal to eight rounds of normal speed. The rowed speeds are for any direction; if you are using hex paper, you may confine galleys to the six cross-face directions. A galley must travel a certain number of rounds on one course before it can take another. This is listed on the table as maneuverability (oar). It is affected by the level of crew ability (see the diagram on page 15).

Table II randomly assigns the level of a ship's maintenance and gives the effects of the resulting level. Adjustments to defensive points are made to each type. The chance of storm damage is to be used with Table IV. The level of maintenance may be improved by one category (poor to accept-able for instance) for every two weeks in

dry dock beyond the normal maintenance. Normal maintenance consists of dry docking the ship for one week every six months and an additional two months at the end of every three years. Failure to do so lowers the level of maintenance by one place immediately, and one place further every six months thereafter. Only a ship built with advanced design features can be returned to that level. Dry docking costs 2% of the ship's value per week. Ancient galleys are exempt from the usual need for maintenance in dry dock, since they are out of the water so much. Dry docking allows other vessels to have barnacles and weeds scraped from their bottoms.

Table III gives the crew's overall rating, the proportions of able-bodied, ordinary, and landsmen sailors, and the effects this has. A galley crew must roll twice to find out what its rating is as a sailing crew and as a rowing crew. Use one or the other rating to determine the effects. The "to hit" adjustment applies only to artillery engines. The adjustment to maneuverabil-ity is made to the rolls indicated on Tables

Table Ib: Ships' combat & defensive abilities

	Defensive points*			Artillery engines				Complement						
	Hull	Each mast	Rigging & sail	Bal-listas	Lt. mangonels	Med. mangonels	Hv. mangonels	Comm. off.	Petty off. I	Petty off. II	Mates I	Mates II	Sailors	Maximum add.
Trireme, aphr.	24	6	4	2	0	0	0	1	3	3	0	0	170	14
Trireme, cata.	24	8	8	4	0	0	0	1	3	3	0	0	170	35
Quadrireme	36	10	12	8	0	0	0	1	3	3	0	0	232	70
Hemiolia	16	6	6	2	0	0	0	1	3	3	0	0	50	6
Triemiolia	8	8	8	2	0	0	0	1	3	3	0	0	74	12
Longship	30	15	7	0	0	0	0	1	1	2	0	0	50	30
River galley	12	8	4	4	2	1	0	1	3	0	1	0	20	20
Boat	6	4	2	1	0	0	0	0	0	0	0	0	16	16
Cog	20	9	10	4	0	0	0	2	4	5	2	0	20	130
Caravel	25	12	14	6	2	0	0	2	4	5	3	2	35	120
Carrack	34	10	15	8	2	2	0	3	6	5	3	5	82	300
Galleon	104	22	28	12	12	12	8	5	8	5	9	10	150	200
Naval cutter	27	9	10	6	10	0	0	1	6	4	3	4	20	20
Brig	42	10	14	12	16	12	0	3	7	4	5	8	45	96
Corvette	51	11	18	16	18	8	6	4	8	5	6	10	84	250
Frigate	60	13	21	16	20	0	6	4	11	5	6	10	84	250
SOL IV Rate	105	23	36	16	26	22	18	6	15	5	9	15	72	250
SOL III Rate	114	25	39	16	28	24	20	8	19	5	12	20	72	280
SOL II Rate	123	27	42	18	30	26	22	10	23	5	15	25	72	290
SOL I Rate	132	29	45	18	32	28	24	6	15	5	9	15	72	360
Naval transport	105	24	36	12	4	4	4	3	7	5	5	10	40	1100
Cutter, small	15	8	5	2	0	0	0	1	4	3	4	3	10	15
Cutter, medium	20	9	10	4	0	0	0	1	4	3	4	3	20	35
Sloop, small	20	10	6	4	0	0	0	1	4	3	4	3	10	25
Sloop, medium	30	11	12	6	0	0	0	1	4	3	4	3	20	75
Schooner, med.	25	12	14	6	2	0	0	2	4	3	4	3	30	61
Schooner, large	38	13	21	8	4	2	0	2	4	3	4	3	30	100
Packet	60	15	24	8	6	2	0	3	6	5	6	10	96	35
Clipper	105	18	36	10	6	2	0	3	8	5	8	12	108	220
Cargo, small	33	8	15	6	2	0	0	1	4	3	4	3	30	120
Cargo, medium	39	12	21	8	4	0	0	2	6	4	6	8	30	175
Cargo, large	75	16	27	10	6	0	0	3	8	5	6	10	30	315
Cargo transport	90	20	32	12	6	0	0	3	8	5	6	15	40	1000

* Defensive points are a ship's hit points (see *DMG,* pages 54-55 and 109-110).

And soon I heard a roaring wind:
It did not come anear;
But with its sound it shook the sails,
That were so thin and sere.

The upper air burst into life!
And a hundred fire-flags sheen,
To and fro they were hurried about!
And to and fro, and in and out,
The wan stars danced between.

From "The Rime of the Ancient Mariner"
by Samuel Taylor Coleridge.

Illustration by Gustave Doré,
courtesy of Dover Publications, Inc.

Ia and Ic. No roll can be reduced below 1. Whenever a ship goes from one POS to another (as shown on Table IV), the base chance for the ship to go in irons is rolled. This out-of-control condition lasts 5-30 rounds. Either indicates the sails were not set properly or it means poor synchronization of the oars.

Good officers improve crew quality through training, good discipline, and fair treatment. Landsmen take three months to rise to ordinary, an ordinary sailor takes one year to rise to able-bodied, and an able-bodied sailor requires one year further to rise to mate. Not all ordinary sailors can rise to ABs, nor can all ABs rise to mate. Only half of those trained are able to progress to the next level of ability.

In Table IV, the effects of wind are explained. Gusts are one Beaufort number higher. The + and - under possible points of sailing indicate which courses are possible or not. Before adjustments are made to the chance for a galley to suffer storm damage, the probability is doubled. A quadrireme of advanced design (-15%) in storm force 10 winds (30%) suffers a 45% chance of damage — not 15% or 30%. In gale and force winds, prudent captains have hatches and ports sealed, sails hauled in, yards or booms lowered, a small storm sail set, a sea anchor dropped over the side, and ensure that a sharp eye is kept

Table 1c: Galleys' statistics

| | Ram? | Oar lenght | No. of banks | Oars/bank | | | Total oars | Rowers/ oar | Total rowers | Oar speed (*) | | | Maneuver- ability (oars) |
				lower	mid.	upper				normal	battle	sprint	
Trireme, aphr.	Y	15'	3	27	27	31	170	1	170	18	21	24	4
Trireme, cata.	Y	17'	3	27	27	31	170	1	170	15	18	21	6
Quadrireme	Y	22'	2	27	0	31	116	2	232	12	15	18	8
Hemiolia	N	12'	2	12	0	13	50	1	50	18	21	24	6
Triemiolia	N	15'	3	12	12	13	74	1	74	18	21	24	6
Longship	N	20'	1	25	0	0	25	2	50	12	15	18	8
River galley	N	20'	1	13	0	0	26	2	52	15	18	21	6
Boat	N	5'	1	8	0	0	16	1	16	12	15	18	4

out for leaks. For every three turns of force-7 + winds, the vessel must make a roll on percentile dice to see if it has taken any storm damage. If there is damage, it occurs in the following order: loss of half of the rigging and sail (R&S) points; loss of the other half of the R&S points; loss of one-quarter of the points for the masts; loss of a mast each time further damage is done, until all the masts are gone; loss of the rudder; and, loss of a sea anchor. Unless a sea anchor has been set when the rudder is lost, the vessel turns sideways to the wind and waves, and it is swamped the next time damage is taken. Once swamped, the ship sinks in 10-60 rounds.

A sea anchor is a canvas funnel held open by crosspieces. Spars, empty water kegs open at one end, or even ship's boats can serve as sea anchors in emergencies. Two sea anchors for each step in size (VS-VL) can stop a vessel in the water. Due to their size and flotation chambers, boats have only half the chance listed of taking storm damage. After a storm, a vessel without a sea anchor might find itself hundreds of miles away from its original position in the general direction of the storm winds.

Table V lists the amount of damage done by assorted disasters, weapons, magic, and things that go splash in the night (or day). A collision is not a gentle bump against the dock; what is meant here is a situation in which two vessels crash together at three-quarters to full speed. Unless a vessel is carrying a ram, this action isn't ramming − it's colliding. If run aground on rocks or reefs, a vessel takes full damage. On sand bars, it takes one-quarter damage; on mudbanks, it takes no damage. A grounded vessel can wait for the tide to rise and float it free, but if deeper water is nearby, it can kedge itself free. Kedging may be absolutely-necessary if the vessel is left high and dry by an ebbing tide. A vessel kedges by lowering its anchor into a boat, which rows away the length of the anchor's cable and drops the anchor. The vessel then winches itself along the cable till it raises the anchor. The procedure may have to be repeated several times.

Weapons cause the damage shown. Ships are AC 0 due to the heavy type of construction used. Galleys are AC 5 due to their flimsy build. If this seems unrealistic,

remember that the U.S.S. *Constitution* got the nickname "Old Ironsides" because cannonballs literally bounced off its sides! Sailing vessels cannot carry arced artillery engines, as they would damage their own rigging and sails. Galleys, on the other hand, would be ripped apart by the recoil of anything heavier than a ballista.

Spells listed as "+ F" cause the damage rolled and set a fire equal in points to the roll. Spells listed as "(F)" set fires only (doing the number of points shown). A *gust of wind* cast in a hostile fashion has a chance of putting a vessel under sail in irons (for 5-30 rounds) equal to 10 times the level of the caster. A vessel running into a *wall of force* dispels the *wall.*

Sea monsters that attack by ramming also have a chance of capsizing a vessel, but only on their first successful ram, Later successful rams cannot capsize the vessel. Very small boats suffer an additional 10% chance of being capsized, small vessels +5%, large vessels -5% and very large ships -10%. Giant octopi, their cousins, and giant sea snakes attack by crushing the hull. The giant cephalopods need to wrap a certain number of tentacles around the vessel for a few rounds before any damage can occur.

Table V does not list the numerous intelligent marine races, which usually attack vessels that are becalmed, anchored, or moving very slowly. However, even vessels sailing at full speed may be stopped and attacked. Since sound travels so well underwater, vessels with noisy crews or with their pumps working attract more attention. Vessels are stopped either by snagging the hull with a large net acting as a sea anchor, or by attaching two sea anchors — one to the rudder (ripping it out) and one to the side of the ship (making the ship turn in circles). The attackers may then attach more sea anchors at their leisure to stop the ship. Both of these methods work 50% of the time. Ancient galleys are hard to snag since their hulls are so clean; furthermore, they have two steering oars. They and the other galleys can continue to steer by using their oars. But the large net that can't snag an ancient galley's hull can foul the oars.

Once a vessel is stopped, the attackers usually board it. At these close quarters, a vessel's heavier artillery engines are use-

less, but ballistas can still be effective, since they are swivel-mounted. In areas where hostile marine races are known to operate, a wise captain may take the obvious precautions of keeping boarding nets hung and increasing the lookouts and guards. Boarding nets are loosely hung from the yards and fastened to the deck. Because they are loose, they are hard to climb or cut. In any campaign world, many maritime powers should be paying tribute to hostile marine races. Pirates may be in alliance with those races.

Table VI gives the distribution for damage caused by weapons. Galleys that do not have their masts raised cannot take mast or R&S damage; those hits are misses in that case. Damage caused by monsters is restricted entirely to the hull. On the other hand, magical powers can be aimed to some degree. The caster or user must specify in which area or defensive point category of the target ship the effect affects. Some targets are very difficult to hit because they are protected by the side of the vessel, are only briefly visible, or can only be reached through a very narrow opening. The whipstaff controlling the rudder in medieval ships is entirely below decks. The wheel of medium-sized and larger ships of later periods is partially below decks. In both cases, orders to the quartermaster are relayed or simply shouted. In galleys and small/very small ships, however, the persons at the tiller or steering oar(s) are exposed.

Table VII deals with towing. The towing and the towed vessels should move in the same direction. Add their actual speeds together and subtract the percentage shown. A ship can be towed by all of its boats rowing together at a maximum speed of 1 mph.

Table VIII deals with the effects of fire, damage to the three defensive point categories, repairs, and their costs. Fire is a wooden vessels deadliest enemy. It takes two gallons of water to extinguish one point of fire. If a ship were hit with a *fireball* cast by a 12th-level magic-user and the ship failed its saving throw, then the *fireball* does six points damage due to the explosion and sets a six-point fire. Besides buckets and pumps, there are several spells that are effective in fire-fighting (*create water, cloudburst,* etc.).

The second part of Table VIII deals with hull damage and its effects. The percent of the hull damaged is also one-half the percentile chance for the vessel to start sinking, which is roiled every turn. Regardless of the cause, a vessel takes 10-60 rounds to sink. Serious damage above the waterline can cause a vessel to start breaking up and sinking. However, by making temporary repairs, the threat of sinking can be countered. There are two sorts of temporary repairs to the hull: fothers and patches. A fother is a reinforced tarred piece of canvas that is positioned over a hole by ropes running under the hull. The pressure of the water trying to flow through the

Table II: Ships' maintenance and effects

	Very poor	Poor	Accept-able	Good	Excellent	Advanced design
Naval	1-5	6-10	11-40	41-80	81-97	98-00
Pirate/Buccaneer	1-20	21-40	41-60	61-80	81-98	99-00
Privateer	1-10	11-20	21-46	47-72	73-98	99-00
Commercial	1-15	16-30	31-55	56-85	86-95	96-00
Effect on speed	-15%	-10%	-5 %	−	+5%	+10%
Effect on def. points	-10%	-5%	—	−	+5%	+10%
Effect on maneuverability	+2	+1	—	−	- 1	- 2
Effect on chance of storm damage	+20%	+10%	—	−	-5%	-15%

hole keeps the fother in place. If the damage is due to weapons or collision, then one-quarter of the damage to the hull is presumed to be below the waterline. Hull damage from ramming or running aground is entirely below the waterline.

Above the waterline, the carpenter and carpenter's mate can easily place a wooden patch. When the hole is below the waterline, however, a hole can only be patched if the ship is careened. Careening a ship lays it over on its side until the keel is almost at the surface. This is done by moving the supplies and cargo over to one side of the ship. Careening should only be done in very quiet waters when the air is very still. A sudden gust can make the ship "turn turtle" — in other words, sent the keel straight up and the masts straight down. Ancient galleys can be beached for patching. Since fothers leak, the pumps must be worked full-time by four of the crew if used. Permanent repairs alone restore hull defensive points and must be done in dry dock. The cost is equal to 40% of the ship's value multiplied by the percent of hull damaged; this action takes 4-16 days.

To illustrate the rules given above, consider the following example. A clipper with 105 hull defensive points takes 21 points of damage (20%) due to running over a reef. Every turn thereafter, it must roll over 10 on a percentile die or start sinking. However, the captain prudently laid out some dozen fothers on the upper deck ready to use. As a result, all of the damage is fothered at the end of 10 rounds. Fortunately for the ship, it did not fail any of its "sinking" rolls while the

fothers were being placed. A few days later, the clipper makes port, unloads its cargo, and heads for dry dock for 10 days. The original cost of the clipper was 100,000 gp, 40% of which is 40,000 gp — which, multiplied by 20% hull damage, is 8,000 gp! Needless to say, the captain will be more wary of reefs in the future, if she is still captain.

Damage to the masts is very serious. Lose a mast and not only does the vessel lose that mast's share of the rigging and sails, but it also automatically goes in irons. Obviously, a galley without the mast raised cannot suffer damage to its mast. The points given on Table Ib are the points for a single mast. If the damage distributed among the masts is equal to or greater than a single mast's defensive points, then there is a 33 1/3% chance of losing a mast per round (1-2 on 1d6). At

sea, up to three fourths of the total mast points can be repaired. This is because most vessels carry a smaller set of spare masts, yards, and sails called the jury rig. Even boats carry a few extra yards of sailcloth. At dockside, a completely new set of masts and yards can be installed and the jury rig stowed away again. The cost of a ship's mast repairs is 40% of the ship's value multiplied by the percent of mast damage; this action takes from 1-4 days. A galley's mast repairs cost 10% of its value multiplied by the percent of damage. Masts, being made of several of the straightest, tallest, and strongest whole tree trunks, are quite expensive.

Damage to the rigging and sails causes a proportional loss of speed. A vessel normally carries enough canvas and rope to replace half its rigging and sail points. In port, new sails cost only 20% of the

Table III: Crew ability & effects

	Very poor	Poor	Acceptable	Good	Excellent
Naval	1-5	6-10	11-70	71-90	91-00
Pirate/Buccaneer	1-15	16-30	31-90	91-98	99-00
Privateer	1-5	6-15	16-80	81-90	91-00
Commercial	1-5	6-15	16-80	81-95	96-00
Landsmen	85%	70%	55%	40%	20%
Ordinary sailors	10%	20%	30%	40%	50%
Able-bodied sailors	5%	10%	15%	20%	30%
Effect on "to hit" scores	- 2	- 1	–	–	+1
Effect on maneuverability	+2	+1	–	- 1	- 2
Base chance to go in irons*	20%	10%	5%	2%	1%

* Check "in irons" chance when changing points of sail, when careening (for turning turtle), or when ship is hit by a sudden natural gust or squall. Triple this chance when changing tack.

Table IV: Wind and its effects

Beaufort force No.	Name	Wind speed (MPH)	Effect on sailing speed	% Chance of storm damage	Possible points of sailing (POS)				
					Tacking	Reaching	Broad reaching	Running free	Running bfr. wind
0	Calm	0	0	–	–	–	–	–	–
1	Lt. air	1-3	1/4	–	–	–	–	+	+
2	Lt. breeze	4-7	1/2	–	–	–	+	+	+
3	Gentle breeze	8-12	3/4	—	+	+	+	+	+
4	Mod. breeze	13-18	Full	–	+	+	+	+	+
5	Fresh breeze	19-24	Full	–	+	+	+	+	+
6	Str. breeze	25-31	+5%	–	+	+	+	+	+
7	Fresh gale	32-38	+10%	5	+	+	+	+	+
8	Gale	39-46	+15%	10	+	+	+	+	+
9	Strong gale	47-54	+20%	20	—	+	+	+	+
10	Storm	55-63	+25%	30	—	—	+	+	+
11	Storm	64-72	+30%	40	—	—	–	+	+
12	Hurricane	73-82	+35%	50	—	—	–	–	+
13	Hurricane	83-92	+40%	60	—	—	–	–	+
14	Hurricane	93-103	+45%	70	—	—	–	–	+
15	Hurricane	104-114	+50%	80	–	–	–	–	+
16	Hurricane	115-125	+55%	90	–	–	–	–	+
17	Hurricane	126-136	+60%	100	–	–	–	–	+

+ indicates that this point of sail may be used.

ships value multiplied by the percent of R&S points lost. The reason for the high cost is that the sails must be custom-fitted to a ship. A galley's sails and rigging cost 10% of its value. If a vessel must have repairs made to two or three defensive point categories, the repairs take as long as the longest of the two or three; the time for one is not cumulative with the

time for another. While in dry dock, a mast can be replaced and the sailmakers and riggers can make new sails and rigging and work on hanging them.

Table IX contains miscellaneous tidbits. Raising an anchor involves winching it up with the capstan. Getting under way is how long a vessel at rest takes to reach full sailing speed, if currently possible.

A vessel in irons (as noted above) is temporarily out of control. How long the vessel stays in irons depends on how quickly the cause is remedied. For the loss of a mast or a poorly executed maneuver, the vessel is in irons for 5-30 rounds. If a vessel loses its captain, there is a 25% chance of going in irons. Once in irons, the ship stays so until the person next in the COC takes command. With the loss of the quartermaster at the helm, there is a 50% chance and the vessel is in irons until a quartermaster, master's mate, the sailing master, a middie, or a commissioned officer takes the wheel. Once in irons, a vessel has no control over its course, cannot fire its artillery engines, and does a fair job of imitating a sitting duck.

Vessels take from 10-60 rounds to sink, but 10 rounds is enough time to launch one boat. Shipping oars means pulling them into the galley; this action takes 1-4 rounds. Shipping oars must be done on the side of a galley which is about to dock or attempt an oar rake. Which vessel rakes and which is raked depends on which can ship their oars; both may ship them quickly enough, but both may also lose their oars.

The actual speed of a sailing vessel is calculated in the following order. The base speed is adjusted by the level of maintenance. The effects of the wind are added or subtracted. If damage has been sustained to the rigging and the sails, speed is reduced by the percent of R&S points lost. A *gust of wind,* cast in a helpful fashion, adds another 5% to the speed of the ship for five rounds. Cast in a hostile fashion, the spell has a chance of putting the target ship in irons.

Table Xa, b, and c are for use when a ship is encountered. These tables randomly select a ship appropriate for the area. The initial distance of the encounter can be as much as 50 miles in clear daylight to as little as a few yards on a moonless or foggy night. On Table Xa, roll for class of ship first: Table Xb gives the number of ships appearing. Table Xc is there to add spice.

Table V: Amount of damage by cause

Source of damage	Damage done*
Collision (hull 75%, mast 25%)	5-30
Ramming (hull 100%)	10-60
Run aground (hull 100%)	10-100
Ballista	1
Mangonel, light	2
Mangonel, medium	3
Mangonel, heavy	4
Catapult, light	4
Catapult, heavy	6
Trebuchet	16
Bigby's clenched fist	1/round
Call lightning	1½ + ½ per level + F
Chain lightning	½ per HD + F
Disintegrate	2
Fireball & delayed blast fireball	½ per HD +F
Firestorm	(F:3)
Flame strike	(F:4)
Gust of wind (hostile)	(in irons)
Horn of blasting	18
Incendiary cloud	(F:½ per 6hp damage done)
Lightning bolt	½ per HD + F
Meteor swarm (2' sphere)	3 each
Meteor swarm (1' sphere)	1½ each
Wall of fire	(F:2½)
Wall of force	As per collision

*Defensive points damage; consult Table VI if necessary, and Table VIII for effects of fire.

Monsters	Hull damage*	% Chance to capsize
Afanc (R)	3-12	15
Archelon ischyras (R)	3-12	7
Crocodile, gt. (R)	2-8	7
Dinichthys (R)	2-8	10
Dragon turtle (R)	3-12	12-14
Elasmosaurus	–	15
Elemental, water (R)	d4 per 4HD	2 per HD
Kraken (C: 6 tentacles)	5-20/rd.	0
Mososaur (R)	3-12	12
Mottled worm	–	15
Narwhale	–	5-7
Nothosaur (R)	3-12	14
Octopus, giant (C: 6 tentacles)	2-8/rd	0
Plesiosaur (R)	5-20	20
Sea dragon (lung wang) (R)	3-12	11-13
Sea snake, giant (C)	2-8/rd	0
Sea turtle, giant	–	15
Shark, giant (R)	3-12	10-15
Squid, giant (C: 8 tentacles)	3-12/rd	0
Tennodontosaurus (R)	2-8	10
Verme (R)	5-20	20
Whale (R)	d4 per 4HD	2 per HD

(R) indicates that ramming is used.
(C) indicates that crushing (with a number of appendages) is used.
* As per *DMG*, pages 54-55 and 109-110.

Table VI: Damage distribution (weapons only)

	d100 Roll
Rigging & sails	1-40
Masts	41-70
Hull	71-00

Table VII: Towing (% adjustment)

Towed size	Towing size				
	V S	S	M	L	VL
V S	50	–	–	–	–
S	75	50	25	12	6
M	87	75	50	25	12
L	93	87	75	50	25
V L	96	93	87	75	50

Ships in distress can suffer a lack of water or food, or a loss of materials for repairs. They can also be lost or under attack. If a shipwreck is rolled, it can be beached, shoaled, or shored on a reef or rocks, with or without survivors. (And are they really survivors or are they dreaded lacedons?) Alternately, the ship could have already sunk, and the encounter is with survivors in the water, boats, or rafts. An abandoned ship could be unharmed, a la Marie *Celeste.*

During wartime, the number of of privateers increases dramatically as pirates seek out pardons and letters of marque. One in six fishing or merchant ships may carry letters of marque "just in case." Commercial ships are very flexible: one day a ship fishes, but on the next, it carries cargo and passengers or goes smuggling. An armed clipper carries twice as many artillery engines as normal, extra crew, lots of marines, and no cargo. Privateer merchant ships are both bait and trap. The idea is to "surrender" quickly, then attack the enemy when it heaves to alongside with concealed crew, marines, or spellcasters.

Additional notes

Before using the naval system in this article, decide what types of vessels you want to include in your world. If the campaign has an ancient flavor, then use the ancient galleys for warships, pirates, and privateers, and the cog as a merchant ship. Medieval settings should use the cog, caravel, carrack, and galleon. Barbarians, especially the ones patterned after the Vikings, should use the longship. The more advanced types of commercial small and medium ships are suitable for larger civilized nations that are noted for their nautical skills. The advanced types of warships should be as rare as they are expensive. The packet and clipper can be used by highly advanced cultures — perhaps nonhumans such as the elves of Tolkien's novels, famed for shipbuilding and maritime skills. Think about where the intelligent marine races are located

and what their political relations are.

Next, create a few vessels to have on hand for the characters to encounter. Give each ship its own sheet of paper and note its statistics, defensive points, level of maintenance, crew, and other important numbers. Figure the actual speed of the vessel for various wind speeds so that the information is on hand. Determine what amounts of damage to the rigging, sails, and the hull represent increments of 10%; these are important for figuring loss of speed and chance of sinking. The more detailed a ship's sheet, the less time spent in looking up the tables instead of playing. Use the other side of the sheet for notes on the vessel's complement. Don't be discouraged by the time spent doing this; this is equivalent to designing an NPC party and a small dungeon. Besides, you only have to do it once.

For ship-to-ship battles, you won't need dice as often as you'd think. With large numbers of rolls for the same group of artillery engines, use the following

method. A zero-level or 1st-level fighter needs to roll a 20 to hit AC 0. That is a 5% chance to hit, and each +1 or -1 "to hit" is another 5% more or less. This figure is also the percentage of the possible total damage that can be done. Suppose a first-rate ship-of-the-line fires off a broadside (half of its artillery engines) at another large ship. If the crew doing the firing is zero or 1st level, and if there are no other modifiers, then 5% of the total possible damage is inflicted, or all of 7 points of damage (6.55 = .05 x 131). At close ranges, almost all of artillery engine shots hit their targets. Massed missile fire can be handled in the same way. Consider the effects of weapons fire up to 10 rounds at a time, but don't forget unusual events, offensive spells, or fire.

Finally, here are a few more words on basic naval tactics. In small engagements, in squadrons or single combat, line battle formation is almost never used. Instead, the ships maneuver independently, trying to gain the favored position off an enemy's stern to deliver one or more broadsides to the stern. The stern and the bow are relatively defenseless, since there are only four to six stern chasers and two or four bow chasers. Crossing an enemy's bow is not favored, since there is a chance of miscalculating the maneuver, which results in a collision. The enemy ship may also swing its bow at the last moment and deliver its own broadside or gain a position on the attacker's stern as it sails past. A ship should flee a battle if it is not doing well; the attacking ship may not be able to pursue. A ship pursued by an obviously superior foe should run for shallow water if it has a draft less than its pursuer. Making several maneuvers that the pursuer must follow may put the hunter in irons, leaving it briefly defenseless.

It should be fairly easy to get PCs living near a coast or on islands to go to sea. Just hit them with a blockade, a pirate raid, a marauding sea serpent, or the like. For the thalassophobes (look it up) in your campaign, you may have to introduce a full-scale embargo of some product they need. You might tempt the high-level characters in the campaign with the notion of a ship or two instead of a keep or a castle. And you can mention faraway islands where riches are just waiting. . . .

Table VIII: Effects of fire

Fire: 2 gallons puts out 1 point of fire. 2 crewmen on a pump put out 1 point of fire/round. 4 crewmen on a pump put out 4 points of fire/round. 8 crewmen on a pump put out 12 points of fire/round.
A fire doubles in size every 4th round if it is not fought.

Hull: percentage hull damaged divided by 2 = percentage chance to start sinking.
3 crewmen can fother 1 point of damage in 1 turn.
1 carpenter can patch 1 point of damage in 2 turns.
Collision and weapons: ¼ damage below waterline; ramming and grounding: all below.
Permanent repairs cost 40% of the ship's value times the percentage of hull damage, and take 4d4 days in dry dock.

Masts: If the damage to the masts equals or exceeds a single mast's points, then there is a 33 1/3 % chance per round of losing a mast; if a mast is lost, the ship goes in irons.
It takes 1 crewmen 1 turn to repair 1 point of damage to a mast.
Up to 75% of all mast points can be restored at sea. Permanent repairs cost 40% of the ship's value (10% for galleys) times the percentage of mast points lost. The repairs take 1d4 days at dockside.

R&S: The loss of a mast takes with it a proportional amount of R&S points.
The percentage of R&S lost = the percentage loss in speed.
It takes 1 crewmen 1 turn to repair 1 point of damage.
Permanent repairs cost 20% of ship's value times the percentage of damage and take 3d4 days.
Repairs to a galley's R&S cost 10% of value times the percentage of damage done.

Oars: A full set costs 40% of a galley's value to replace.

Table IX: Miscellaneous items

Raise anchor: 3-18 rounds   Heave to: 2-8 rounds   Sinking: 10-60 rounds
Get under way: 1-6 turns   In irons: 5-30 rounds
Gust of wind, hostile: (level of caster x 10) = % chance to put in irons
Gust of wind, friendly: +5% sailing speed for 5 rounds.
Actual speed = [(Base speed + Maintenance adj.) + Wind adj. - Damage adj.] + *gust of wind* adjustment (friendly)

Table Xa: Frequency of ship encounters

	Coast or archipelago	Semi-enclosed or landlocked	Open sea	Ocean
Fishing	1-40	1-25	1-15	1-5
Merchant	41-70	26-60	16-55	6-55
Naval	71-85	61-80	56-80	56-85
Pirate/Buccaneer	86-90	81-90	81-90	86-95
Privateer	91-00	91-00	91-00	96-00

Table Xb: Number appearing

	d10 roll		
	1-7	8-9	10
Fishing	1-6	3-18	5-30
Merchant	1-4	2-8	3-12
Naval	1-4	2-8	8-48
Pirate/Buccaneer	1	2-3	3-4
Privateer	1	1	2-3

Inspirational reading
Baker, William A. *The Lore of Sail.* (1983)
Blackburn, Graham. *The Illustrated Encyclopedia of Ships, Boats, Vessels and Other Water-Borne Craft.* (1978)
Casson, Lionel. *Ships and Seamanship in the Ancient World.* (1971)
Cucari, Attilio. *Sailing Ships (1976)*
Forester, C.S. The *Hornblower series.*
Melville, Herman. *Billy Budd, Omoo, Typee,* and (of course) *Moby Dick.*

Inspirational listening
The Clancy Brothers and Tommy Makem. "Sing of the Seal." (Columbia)
Lomax and Kennedy, eds., "Sailing Men and Serving Maids." Vol. 6 of the Folksongs of Britain (Caedmon)
Killen, Louis. "50 South to 50 South: Louis Killen on the Cape Horn Road."
Roberts, John, and Tony Barrand. "Across the Western Ocean." (Swallowtail)

Table Xc: State of encountered ship (if encountered singly)

d100	State of ship
1-79	Normal
80-87	In distress
88-93	Plague
94-97	Shipwreck
98-99	Mu tiny
00	Abandoned

Of Ships and the Sea provides rules for simulating extensive nautical exploration campaigns and running heroic naval battles in a world of early-to-late medieval technology. But what of the player who wants his warrior to command a fleet of triple-masted warships armed with cannons? Or the Dungeon Master who wants to build a campaign around commercial and military shipping, complete with merchant flyboats, privateers, and dangerous trade routes? The development of sailing vessels did not end with the caravel, and the impracticality of ship-mounted catapults and ballistae eventually gave way to iron guns after the development of gunpowder. The AD&D® game has never reflected these elements—until now.

Warships of the Sea

by Keith Francis Strohm

illustrated by
Roger Raupp,
David Kooharian,
and Diesel

Information on sailing vessels and warships from the 14th to 19th centuries appears below. Although designed in accordance with the naval systems found in *Of Ships and the Sea,* this information is completely compatible with the core rules for ships found in Chapter 14: Time and Movement of the *Dungeon Master® Guide.* Additionally, rules for cannon warfare appear at the end of this article. DMs can freely bypass these rules and still use the vessel information; they are not mutually inclusive.

Step lively! The salt road beckons, and your campaign will never be the same again.

The Ships

Historically, nautical vessels have come in many different variations. The ships below represent a few of the major designs and classes of ships. Within each of these vessel types, individual naval powers made their own modifications. For example, a Dutch galleon, while resembling an English vessel of the same model, might have very different specifications in armament, rigging, and cargo and personnel capacity. Likewise, the following ships represent a baseline upon which a DM may build, making these vessels faster or slower, more or less maneuverable, and stronger or weaker in combat-as befits the needs of the campaign.

Brigantine

The brigantine is a two-masted vessel with square rigging on the foremast and fore-and-aft rigging on the mainmast. Equipped with both oars and sails, this highly maneuverable vessel was favored by pirates in the Mediterranean Sea. (In fact, the vessel's name comes from the same root as "brigand.") Brigantines are generally 120 feet long with a beam of about 20 feet. They can carry 100 tons of cargo. Some pirate captains outfit their brigantines with rams. This addition, along with the vessel's natural maneuverability, makes the brigantine extremely dangerous at close range.

Table 1: Ship Types

Ship Type	Base Move/Hour	Emergency Move	Seaworthiness
Brigantine	14/6*	12	65%
Carrack	7	7	75%
Cutter	11	15	55%
Fluyt	12	6	75%
Frigate	7	9	70%
Galleass	4/7*	10	65%
Galleon**	8	7	90%
Lugger	13	20	55%
Pinnace	5	8	70%
Sloop	7	12	70%

* When a slash separates two numbers, the first represents the speed of the vessel while under sail, and the second represents the speed of the vessel while rowed.

**The galleon stats listed in the *Dungeon Master®* Guide represent an earlier incarnation of that vessel. The stats above detail an 18th century galleon.

Carrack

The carrack is a three-masted ship highly valued for its capacity for large amounts of troops or cargo. Developed somewhere around the 15th century, this ship was the first square-rigged vessel to sail the seas. Although once seen as the immediate predecessor of the galleon, the carrack's design emphasizes defense rather than maneuverability or armament. The aft and forecastles of this vessel are essentially small fortresses with many archery and gun slits. This design makes the vessel highly resistant to boarding. Carracks are usually 160 feet long with a 45-foot beam. Because they often make transoceanic journeys, carracks have hold capacities of 700 tons of cargo.

Cutter

The cutter is a medium-sized, single-masted, gaff-rigged vessel that was used widely in the 18th century to patrol coastal waters or to deliver messages. Fast and maneuverable, these ships possess armament consisting of up to 12 light cannons. Despite their versatility, cutters perform poorly in adverse weather and cannot withstand a concerted attack from most warships.

Cutters are 40 feet long with a beam of 15 feet. Although they usually stay within easy sailing distance of the coastline, these vessels have a small area below decks in which the crew can sleep. Cutters have no hold to speak of and can carry only five tons of cargo.

Fluyt

Also called a "flyboat," this Dutch vessel became the most important merchant ship in northern waters during the 17th century. It is designed to carry a large amount of cargo for a minimum cost. A flat-bottomed boat with a high, ornate stern, this ship is narrow in relation to its great length. The fluyt has straight sides both fore and aft, and a very wide bow. Generally, these vessels possess one or two masts with light rigging. Because of this, the fluyt requires only a very small crew to operate.

Fluyts are nearly 200 feet long and have a beam of 30 feet. Their narrow beams and simple rigging make these ships somewhat unsteady in rough weather. Thus, they usually sail near coastlines and other areas of civilization. These ships can carry up to 800 tons in their vast holds.

Frigate

Armed with 30 guns across a single gundeck, this large vessel often escorts trade convoys or supplements the firepower of larger warships in a fleet. A fully-rigged, three-masted frigate is slightly less maneuverable than a cutter, but the ship makes up for this with greater stability.

Frigates are 140 feet long with a beam of 35 feet. Though these vessels do not have extensive holds, they can store up to 200 tons of cargo. In addition to normal crew quarters, frigates also contain barracks for 200 marines.

Table 2: Ships

	Draft	Length	Beam	Cost (gp)	Construction	Size	Crew	Passengers	Cargo	Cannons
Brigantine[1]	2	120	20	25,000	2	VL	50/30/15	60	100	L,M
Carrack	5	160	45	50,000	5	H[3]	60/30/20	300	700	All
Cutter	1	40	15	10,000	1	M	6/4/2	25	5	L
Fluyt	3	200	30	40,000	3	H	20/15/7	20	800	-
Frigate	4	140	35	45,000	4	H	40/20/10	200	200	L,M,H
Galleass[2]	5	140	30	40,000	4	H	150/95/41	100	150	L
Galleon	6	160	45	75,000	6	H	75/45/25	350	500	All
Lugger	1	45	15	15,000	1	M	10/5/3	5	10	-
Pinnace	4	130	25	35,000	3	VL	40/20/10	100	100	L,M
Sloop	2	100	30	25,000	2	VL	30/15/5	50	60	L,M

1. A brigantine's crew includes 30 rowers; 10 rowers constitute a skeleton crew, and the minimum number of rowers is 5.

2. A galleass's crew includes 120 rowers; 60 rowers constitutes a skeleton crew, and the minimum number is 30.

3. H represents a new size class of ships: Huge. Huge ships are vessels over 140 feet long, which means that the Very Large category starts at 101 feet and ends at 139 feet. The addition of a new size category changes the Hull/Crippling Points of several vessels detailed in *Of Ships and the Sea*. To modify the Hull/Crippling points of vessels in *Of Ships and the Sea* that fit in this new category, simply multiply their Seaworthiness rating by 5. Thus, a Huge dromond has 40 Hull/Crippling Points and a Manta has 90.

Draft, given in feet, is the minimum amount of water necessary to float a vessel. A ship with a 4′ draft needs at least 4 feet of water in which to float. If a ship travels in an area of less depth than its required draft, it must make a Seaworthiness check or run aground.

Beam, given in feet, is a measurement of a ship's width at its most extreme point. A ship with a 20-foot beam measures 20 feet at its widest point.

Construction is the amount of time needed to build the vessel in months.

Crew represents the number of sailors and rowers on board a particular vessel. The first number in the column indicates the maximum number of crew a ship can support. The second number is the average number of crew needed to operate the ship, and the third represents the absolute minimum number of crew needed to operate the ship.

Passengers details the maximum number of extra personnel (those people not involved in operating the ship) a ship can carry. Marines count as passengers.

Cargo is the total amount of weight a ship can carry, measured in tons. Vessels can substitute one passenger for every ton of reduction. Thus, a ship with a 200-ton cargo hold could carry 200 additional passengers if it jettisoned all its cargo.

Cannons details the type of mounted weapons a ship can carry. See **Table 4: Armament** for more details.

Galleass

The galleass is an attempt to combine the superior seaworthiness and armament of a galleon with the speed and maneuverability of a galley. Despite many attempts at perfecting the galleass, it never really gained popularity as a warship. Early versions had the ship's guns mounted below the oarbank, requiring rowers to pull their oars out of the water and hold them above the guns for the cannons to fire. Later vessels of this type mounted up to 35 guns along the rails of the topdeck. However, these were only light cannons, as heavier armament unbalanced the galleass. The galleass has three masts and a lower deck fitted with oars.

These vessels are much more useful as freight carriers, and were widely used for this purpose during the 16th and 17th centuries. Because of their basic galley design, galleasses usually stay near coastlines. There are no quarters for crew or marines, but each galleass normally transports 100 marines when on a military expedition. Galleasses are 140 feet long with beams of 30 feet. Their hold can store up to 150 tons of cargo.

Galleon

Built similarly to a carrack, the galleon was first created by the English in the 16th century and later adopted by the Spanish navy. This ship represents one of the greatest achievements of nautical design. The galleon has four masts—square rigged except for the mizzen-mast, which has a lateen rigging—and a low beak head like a galley, instead of the usual high forecastle. This low design makes the ship much more seaworthy and maneuverable, as shipbuilders had discovered that high forecastles caught the wind and forced a ship to veer off its course.

Galleons possess multiple decks along which protrude gunports and barracks for up to 150 marines, making them premiere warships; this was especially true during the 18th century, when the largest of these ships could fire up to 100 guns at a time. Because of the variation in armaments among these ships, they are divided into differing rates: The lower the rate, the larger and more powerful the vessel. The statistics given in Table 2 represent a standard 5th-rate galleon.

Galleon Cutaway
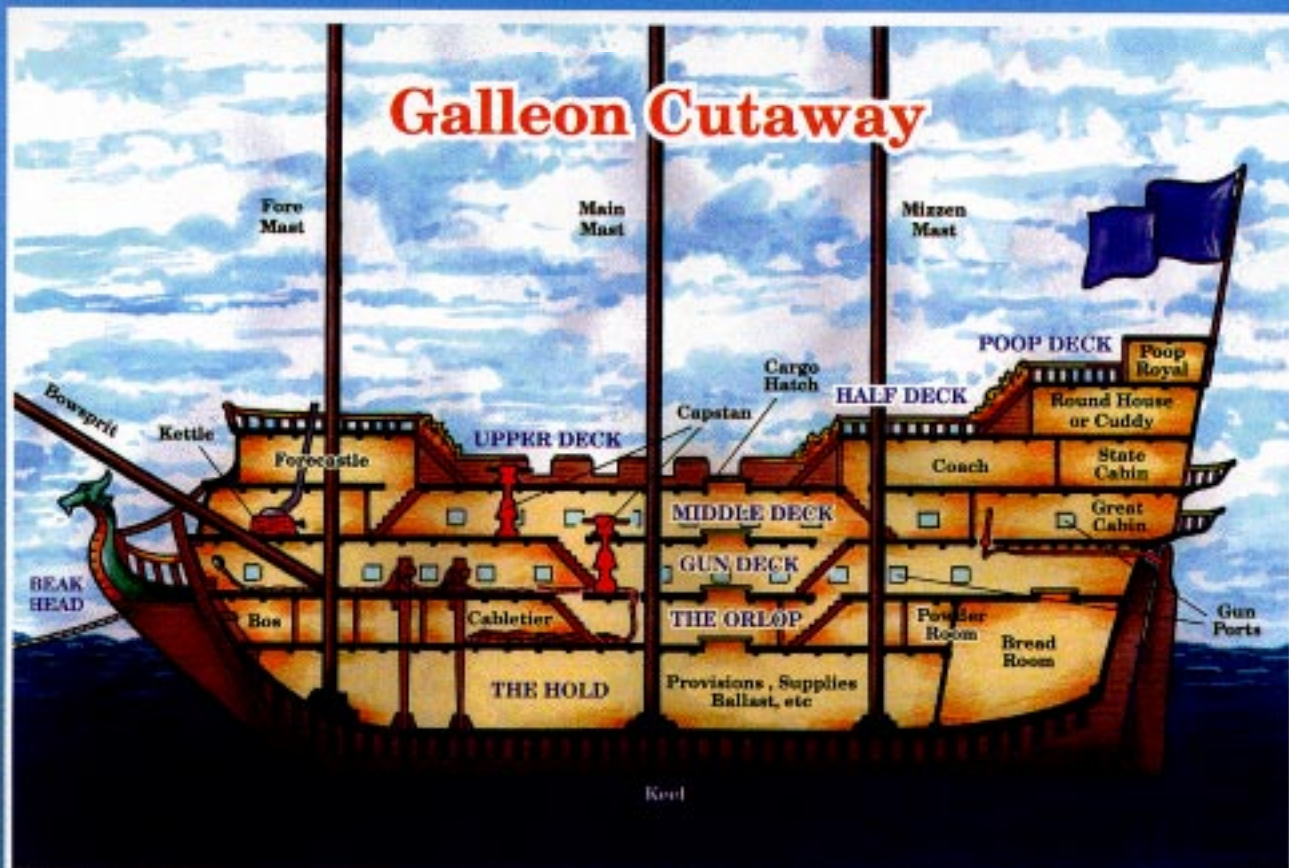
Although they function as men-of-war, galleons are often used for exploration, due mostly to their superior seaworthiness and available space. The average (5th rate) galleon has two decks and stretches out 160 feet in length with a 45' beam. Its hold can store up to 500 tons of cargo.

Lugger
Similar to a brigantine, the lugger is a smaller, more maneuverable vessel used by pirates and smugglers. This ship lacks the formidable ram and mass of a brigantine, but it makes up for these faults with speed and maneuverability. Additionally, a lugger does not require a large crew, thus freeing up more personnel for boarding actions.

Luggers are 45 feet long with beams of 15 feet. Although a lugger's hold can store only 20 tons of cargo, many pirate captains fill it with additional brigands to increase the size of boarding parties. It is not uncommon for a lugger to accompany a brigantine on a raid. Additionally, the speed of the lugger makes it a perfect vessel for blockade running.

Pinnace
Another Dutch-built vessel, the pinnace appeared at the beginning of the 17th century. This vessel sports three masts and a beakhead, and it can carry up to 24 medium cannons. Historically, the frigate soon replaced the pinnace as the preferred midsize warship, but merchants continued to use the Dutch vessel for commercial sailing.

The pinnace is 120 feet long with a beam of about 25 feet. It can store up to 100 tons in its cargo hold.

Sloop
The sloop is one of the smallest warships. This vessel has two masts and usually carries 18 medium cannons. Fairly maneuverable and seaworthy, sloops often patrol coastal waters and assist larger warships in battle.

Sloops run 100 feet long with beams of 30 feet. In addition to their crew complement, these vessels have room to transport up to 60 marines. Sloops have holds capable of storing only 50 tons of cargo.

AD&D Core Rules Statistics
Table 1 lists the information necessary to use these new vessels with the rules that appear in the *DMG.*

Tables 2 and 3 offer general and combat-related statistics compatible with *Of Skips and the Sea.* A summary of the information follows the tables. Interested persons should consult *Of Ships and the Sea* directly for more detailed information.

Galleons
The galleon statistics in Tables 2 and 3 represent a 5th-rate galleon. To simulate varying rates among galleons, make the following modifications:

Increase a galleon's draft by 1 foot, its length by 10 feet, its beam by 2 feet, its cargo capacity by 50 tons, its passenger and marine complement by 20, and its number of cannons by 5 for every rate better than 5th (to a maximum of 1). Likewise, decrease these stats by the same amount for every rate below the 5th (to a maximum of 8).

Thus, a 4th-rate galleon has a draft of 7 feet, a length of 170 feet, a beam of 47 feet, a cargo capacity of 550 tons, and 85 cannons.

Table 3: Ship Combat Statistics

	Move	Seaw	Pursuit	Man.	Size	RF	Defense Class	Mar	Hull Points	Can. Type
Brigantine	36/20/16	14	1d6+14	1d6+9/1d6+10	VL	0(2)	A	60	42	10/L
Carrack[1]	21	18	1d6+6	1d6+3	H	0	A	300	90	20/H
Cutter	15	12	1d6+4	1d6+8	M	0	C	25	18	12/L
Fluyt	12	14	1d6+5	1d6+4	H	0	A	20	70	-
Frigate	18	17	1d6+6	1d6+6	H	2	A	200	85	30/H
Galleas	24/8/16	17	1d6+8	1d6+2/1d6+3	H	1	A	100	85	35/L
Galleon	24	19	1d6+8	1d6c4	H	0	A	350	95	80/H
Lugger	15	14	1d6+5	1d6 +12	M	0	C	5	21	-
Pinnace	18	15	1d6+6	1d6+5	VL	1	A	100	60	24/M
Sloop	15	16	1d6+5	1d6+7	L	0	A	60	48	18/M

1. Because they are built to withstand boarders, carracks force a -3 penalty to all enemy vessel rolls on Table 27: Boarding Action Results in *Of Ships and the Sea*.

Move details the speed of individual ships in tens of yards per melee round. The numbers separated by slashes represent the speed of vessels equipped with both sails and oars. The first number is a ship's speed under both sails and oars. The second number is a ship's speed under sails only, and the third number shows a ship's speed under oars only.

Seaw(orthiness) indicates the stability and durability of a vessel-the higher the number, the more seaworthy the vessel. To make a successful Seaworthiness check, the DM simply rolls a d20, comparing the result with the ship's rating. If the roll is greater than the Seaworthiness value, the ship founders or grounds.

Pursuit represents a ship's ability to use its speed to catch or avoid enemy ships. A vessels pursuit rating equals 1/3 its current movement rate. The entry on Table 3 is the typical value for each vessel.

Man(euverability) indicates the overall maneuverability of a ship. Vessels possessing both oars and sails have two Maneuverability ratings. The first (lower) number is the craft's maneuverability when moving under sail, even if the ship employs its oars. The second number is the vessel's maneuverability under oars.

RF, or ramming factor, refers to a vessel's ability to use its mass as an effective ram. Most ships possess numbers between 0 and 4 to indicate overall ramming ability. Vessels with ratings of 0 are not designed to ram other ships; however, their captains can still attempt to ram See page 46 in *Of Ships and the* Sea for ramming rules.

Defense Class shows how much protection against missile fire a ship offers its crew and passengers. Most large sailing ships provide Class A defense; the vessels have superstructures that give reasonable concealment, but leave sailors exposed. Large rowing vessels feature Class B defense; fewer people must brave missile fire to man the sails, but a volley of arrows can inflict considerable casualties among their rowers. Class C ships tend to be fairly small, though their crews can find some cover under the decks and rigging. Class D ships have no decking and very little rigging to provide cover from missile fire. Class X vessels are both open and very small.

Mar(ines) is the number of marines a ship can hold. (See *OSAS*, page 65, for details.)

Hull Points refers to the amount of damage a ship can withstand before cracking apart or becoming crippled.

Can./Type indicates the number of mounted weapons on board a vessel. They are divided into three categories: light (L), medium (M), and heavy (H). Note that these numbers represent the maximum armament of that craft. Ships that can mount more than 1 type of armament (see Table 2) have the option of mixing their cannon types, but they can never have more than their maximum number.

For example, a ship that has 20 heavy cannons can mount 10 medium and 10 heavy cannons.

Cargo Capacity Modifications

The ship statistics detailed in this article's tables represent craft operating at maximum efficiency. Such vessels handle quite differently when loaded down with heavy materials. To account for this difference, simply apply the following modifiers to the ship's pursuit and maneuverability rolls (see Table 3):

Cargo hold is . . .	Modifier
More than 25% full	-1
More than 50% full	-2
More than 75% full	-3
Completely full	-4

For example, the DM wants to calculate the modified handling of a pinnace carrying 30 tons of cargo. The DM checks the overall capacity of the ship on Table 2 (100 tons) and determines that more than one-quarter of the pinnace's cargo capacity is in use. Therefore, the DM reduces the ship's overall movement rate (taking into account wind conditions and any other modifiers to movement before the modification) by 2.

Cannons in Naval Combat

The use of cannons changed the face of naval combat. Opposing vessels no longer had to engage in close combat maneuvers such as ramming and boarding. Rather, cannon-armed craft turned their gun ports toward their enemies and fired until one smoking, holed ship raised the flag of surrender. Because of this, ship design became broader and heavier, and the great naval powers of the world built grand, multi-decked vessels capable of carrying a great deal of firepower and withstanding attacks from heavy artillery. Thus, frigates and higher-rate galleons became the warships of choice for the European navies of the 18th and 19th centuries.

The Guns

Cannons were typically forged of iron or brass. Most navies preferred brass for their mounted weaponry, as the metal did not rust. However, the less-expensive iron guns were far more prevalent. Iron guns require an Item Saving Throw vs. Corrosion (14) for every month they are out at sea. They suffer a -1 cumulative saving throw penalty for every month at sea after their first.

Table 4: Armament summarizes the relevant game information for these weapons. DMs should feel free to modify the particulars of the table to fit their individual campaigns.

The caliber of cannons varied widely throughout various navies, ranging anywhere from 2-lb. to 50-lb. guns. Despite their names, the poundage of such guns referred to the weight of their shot, not the weapons themselves. Heavier guns simply fired heavier shot. The cannons themselves weighed several tons.
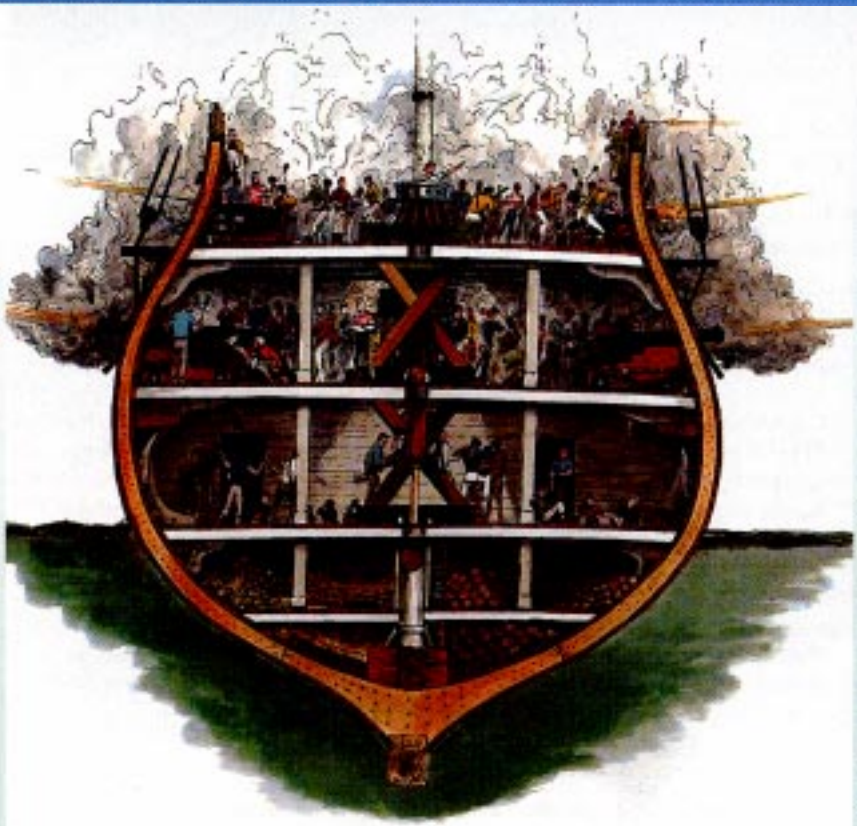
In the AD&D game, mounted weapons fall into four categories: light cannons, medium cannons, heavy cannons, and mortar. Warships mount light cannons on the rails of their top decks. Cannoneers use these weapons as anti-personnel devices, firing light shot at boarders or rigging. Light cannons can also fire 2-lb. shot (see "Artillery," below for more details). Finally, mortar guns fire high-caliber shot to devastating effect-although their range is limited.

Because of their weight, medium and heavy cannons, a well as mortar guns, must sit on a vessel's lower decks. The heavier the cannon, the lower the deck upon which it must be mounted. This weight often slows ships, but it grants them greater firepower.

Gunpowder

Cannons require gunpowder or its magical equivalent. This allows a DM to regulate the use of cannons, as he can modify the price and availability of such substances. As a general rule, gunpowder or magical powder costs 300 gp per pound. A pound of powder is sufficient for 10 light cannon, 6 medium cannon, 4 heavy cannon, and 1 mortar shot.

Generally, artillerists keep supplies of gunpowder (or its equivalent) in containers on their person (one-pound horns) and near their cannons. However, such substances are notoriously inflammable or unstable. Thus, incendiary and heat-based attacks-like flaming torches, Greek fire, and fireball spells—can wreak great damage on ships carrying powder. If gunpowder is exposed to fire, it must make an Item Saving Throw (as oil) against Normal or Magical Fire (depending upon the type of attack). If it fails, the powder explodes in a 15'-radius, causing 3d6 hp damage (and Hull points) per pound of powder. In addition, exploding powder can set off chain reactions if any other containers holding the substance lie within the blast radius. These exposed powders must make Item Saving Throws or else also explode. Ships from highly technological or magical societies may have protection that negates or modifies these Item Saving Throws.

Cannon Weight and Craft Performance

To simulate the effect that cannons have on the performance of ships, first find the weight of each cannon (see Table 4) and multiply it by the number of all cannons on the ship. Then, add this total to the current weight of the ship's cargo to determine the fraction of the ship's cargo capacity currently in use. Finally, modify the craft's performance based on the "Cargo Capacity Modifications" section.

For example, a DM wants to determine how a sloop's 10 medium cannons will affect its performance. The DM refers to Table 4 and discovers that medium cannons weigh 2 tons each, then multiplies the weight of each cannon by the number of cannons and comes up with 20 (10 cannons x 2 tons = 20) tons. The DM then checks Table 2 to find the total cargo capacity of a sloop (40 tons) and discovers that the medium cannons take up half of the sloop's total cargo capacity. Finally, the DM applies a -2 modifier to the ship's final Pursuit and Maneuverability rolls, as per the "Cargo Capacity Modifications" rules above.

Cannon Shot

As mentioned previously, cannon ammunition comes in varying calibers. The lightest iron balls fired by mounted weapons weighed two lbs. Usually,

Table 4: Armament

Type	Crew	THAC0	Range	Caliber	Weight	Cost
Cannon, Small	2	12	- / 1 / 2 / -	S, B, C, 2	350 lbs.	1,000 gp
Cannon, Medium	3	14	10/20/30/40	12,16	2 tons	3,000 gp
Cannon, Heavy	4	16	20/30/40/50	24,36	4 tons	6,000 gp
Mortar[2]	6	17	30/40/50/60	50	8 tons	9,000 gp

1. The cost listed here refers to iron weapons. Multiply the cost of these armaments by three for the brass versions.

2. Ships cannot mount more than three mortars on any given ship, as these weapons are bulky and have a tremendous "kickback." Anytime a vessel fires more than one mortar in a given round, it must make a Seaworthiness check.

Crew refers to the amount of personnel necessary to operate the armament.

THAC0 is a function of the armament itself and not the operator. Cannon targets are effectively AC 0. Mortar targets are effectively AC 4.

Range indicates the maximum firing range of each weapon. These ranges are subdivided into minimum, short, medium, and long categories (all numbers are in tens of yards). For example, a Medium Cannon can not hit unless it is at least 100 yards away from its target. At medium range, a weapon suffers a -2 attack roll penalty. This penalty increases to -5 at long range.

Caliber details the types of shot a particular weapon can utilize. Thus, a Medium Cannon can fire 12-lb. and 16-lb. shot, but it can not fire 2-lb. or 50-lb. shot. See the Cannon Shot section for more details.

artillerists loaded light cannons with anti-personnel shot. This type of ammunition came in three forms: (S)hrapnel, sharp fragments of metal that formed a curtain of death when fired; (B)ar shot, small iron balls joined by an elongated metal bar; (C)hain shot, small iron balls connected by flexible chain. These guns inflict damage in a 5' radius.

Heavier iron ball shot proved quite effective in smashing the hulls of opposing vessels. Although loading such ammunition into a cannon and preparing the weapon to fire took valuable combat time, the damage potential of high caliber cannon shot turned the tide of many a naval battle. Refer to Table 5: Ammunition for the exact combat statistics of caliber shots in the AD&D game.

Crew Experience and Rate of Fire

Of Ships and the Sea gives information relating to the overall experience of a vessel's crew. If the DM wishes, he can modify the rate of fire for cannons and mortars according as follows: Landlubbers add 2 rounds to their rate of fire, Scurvy Rats add 1 round to their rate of fire, Mariners subtract one round from their rate of fire, and Old Salts subtract 2 rounds from their rate of fire. Thus, six

Old Salts manning a medium cannon fire once every 4 rounds. Thus, they can fire twice in a lo-minute combat round.

Running Cannon Combat

Using the core rules, cannon battles occur just as regular combat. To simplify the "bookkeeping," the DM should use group initiative for each vessel in the battle. If the DM wishes, he can allow PCs to make saving throws vs. breath weapon to reduce cannon damage by half.

If the DM uses the rules found in *Of Ships and the Sea*, cannon combat occurs during the Action phase as an artillery attack. Because cannons and mortars are mounted weapons, a vessel can bring only one half of its armament to bear in any combat. Thus, a 1st-rate galleon can fire 50 of its guns in one round, then-if it wins a subsequent Maneuvering phase-fire the other 50 guns as it brings the other ports to bear and allows the recently fired cannons reload. Such tactics are particularly effective if an enemy vessel has inferior firepower.

Nautical Glossary

DMs and players alike can use this glossary to add depth to game play. While too much jargon can confuse and overcomplicate an encounter, a few well-placed nautical terms can set the mood for an entire evening's adventures.

Abaft: Toward the stern of a ship relative to some other object or position (i.e., "abaft the mizzen mast").

Abeam: On a bearing or direction at right angles to the fore-and-aft line of a ship.

Aboard: In or on board a ship.

About: Across the wind in relation to the bow of a sailing vessel.

Aft: At or toward the stem. (The adjectival form is after, ie *the after gangplank.)*

Aground: Resting on the bottom. If done purposefully, a ship takes the ground, when done accidentally it runs aground.

Ahead: The forward movement of a ship (to sail ahead) or any distance directly in front of a ship on its current heading.

Ahoy: The standard hail by which a ship's crew attracts the attention of a crew on another ship.

Aloft: The area above or overhead of the ship-including anywhere about the upper yards, masts, and rigging of ships.

Amidships: In the middle of a ship. Sometimes shortened to midships when given as a helm order.

Anchorage: An area off a coastline that provides secure holding for anchors.

Apostles: The two large bollards fixed to the main deck of square-rigged ships.

Astern: The backward movement of a ship or the hinder part of a vessel.

Athwart: A direction across the line of a ship's course.

Backstays: Long support ropes running from all mastheads above the lower masts to the sides or stem of a ship.

Ballast: Additional weight carried in a ship to give it more stability.

Bare Poles: The condition of a ship when it trims all of its sails in the face of extreme winds or storms.

Battens: Thin, flat pieces of wood used to stiffen sails.

Batten Down the Hatches: Securing the hatches by means of gratings and tarpaulins that are kept in place by the addition of battens.

Beakhead: The space in a ship of war immediately foreward of the forecastle, used as a lavatory. Also called a head.

Beam: The measurement of a ship at its widest part.

Berth: A place to sleep on a ship or a place to moor a vessel when in a harbor.

Board: The name given to each tack of a ship when it sails against the wind.

Bollard: A large post of wood or metal sunk in the quay to which a vessel's mooring lines are fastened.

Boom: A spar used to extend the foot of a sail in a square rigged vessel or a permanent spar at the foot of the main-sail in a fore-and-aft rigged ship. Also a floating barrier at the mouth of a harbor.

Bow: The foremost end of a ship.

Bowsprit: A spar carrying its own sail that projects over the bows of a vessel.

Brace: Moving the yards of a square-rigged vessel so as to present the opti-mum amount of sail for the desired maneuver.

Bulkhead: A vertical partition divid-ing a ship into separate compartments.

Bulwarks: The sides of a ship above the upper deck built to protect mariners from high seas.

Burthen: A term used to describe the measure of a ship's carrying capacity, based on the number of tuns of wine a hold could store.

By the Head: A term that describes a ship that draws more than its normal depth of water foreward, with its bow lying deeper than its stem.

By the Stern: A term that describes a ship that draws more than its normal depth of water aft.

Cabin: A sleeping compartment.

Canvas: A cloth properly woven of hemp. The name derives from the greek word kannabis, which means hemp.

Capstan: A cylindrical barrel fitted on large ships for heavy lifting work, par-ticularly lifting anchors.

Castles: Fighting platforms erected at each end of a warship, forecastles at the fore and aftcastles (or sterncastles) at the aft or stem of a ship.

Cast off: To release a rope so that a ship may sail out to sea.

Coxswain: A name for the helmsman and senior member of a ship's boat.

Crow's Nest: A look-out station on the foremast, originally made from a barrel.

Table 5: Ammunition

Caliber	Damage (DMG)	Damage (OSS)	ROF	Bonus
Shrapnel	1d4	3 / -	1/2(5)	-
Bar	1d4+1	4 / -	1/2(5)	-
Chain	1d4+3	5 / -	1/2(5)	-
2-lb.	1d6+1	6/1d3	1/3(3)	-
12-lb.	1d8+4	- / 1d6	1/4(2)	+1
24-lb.	3d8+4	- / 2d4	1/6(1)	+2
36-lb.	4d8+6	- / 2d6	1/8(1)	+3
50-lb.	5d8 + 10	- / 3d6	1/10(1)	+4

Damage (DMG): The die range indicates the amount of damage a weapon inflicts if the DM uses the naval rules found in the *Dungeon Master Guide,* or if the weapon fires that type of ammunition at creatures (see Table 35: Artillery vs. Creatures in *Of Ships and the Sea).* Note that in the core rules, these weapons inflict damage in a 5'-radius.

Damage (OSS): This value refers to the naval combat rules found in *Of Ships and the Sea.* The number before the slash indicates the missile factors that a weapon adds to any missile attacks. Note that only ammunition fired out of light cannons functions this way. Shot from medium cannons and heavier weapons only strike a vessel itself, as these armaments are mounted on the lower decks, making it impossible for artillerists to aim at enemy crew. The die range after the slash indicates how much damage the shot inflicts if it strikes a ship itself.

ROF: This indicates how often the weapon can fire. The first number indi-cates the weapon's rate of fire in one-minute rounds. The number in parenthe-ses is the weapon's rate of fire during ten-minute combat rounds (found in *Of Ships and the Sea).*

Bonus: This bonus applies to all rolls on Table 22: Artillery Effects in *Of Ships and the Sea.*

"Cutting his painter": A sailor's expression that refers to the clandestine departure of a ship in harbor, or, in refer-ence to an individual, to depart one's life.

Deck-house: A small cabin or hut on the upper deck of a ship.

Draught: The minimum amount of water necessary to float a ship.

Draw: A sail draws when it is full of wind.

Drive: A word used to describe when wind and sea push a ship leeward.

Fathom: A unit of measurement used to determine water depth. A fathom is roughly 6 feet.

Fetch: To arrive, especially after a hard storm.

Fitting-out: The preparation of a ves-sel right before it sails out to sea.

Fore-and-aft rig: Rigging that stretches out along the length of a ship.

Foremast: The mast nearest to the bow.

Freeboard: The vertical distance between the waterline and the upper deck of a ship.

Furl: To gather up the sails and secure them to the mast or yard.

Gaff: A spar whose lower end runs up and down the mast of a fore-and-aft rigged vessel.

Galley: A ship's kitchen.

Gangway: the movable passageway by which sailors and passengers embark or disembark.

Gunport: A hole cut into the side of a warship used to fire broadside guns.

Gunwale: The piece of timber that runs along the top of a ship's side.

Gybe: To swing across. Used when the boom of a fore-and-aft rigged vessel swings across as the wind crosses the stem of the ship.

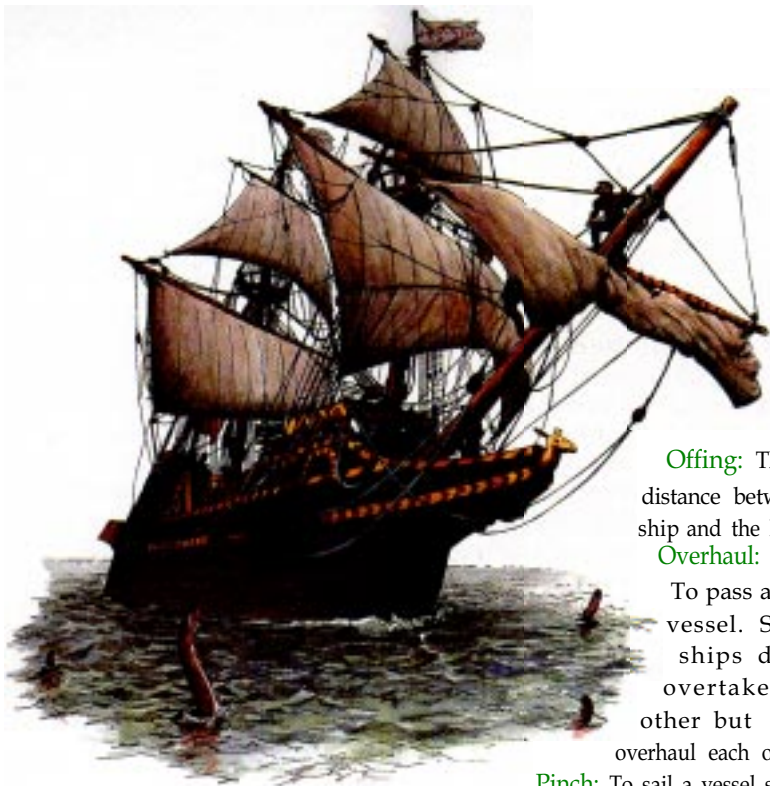**Halyards:** The ropes and tackles used to hoist and lower sails.

Handsomely: A term meaning grad-ually and carefully, as in the phrase "Lower the boom handsomely."

Heave-to: To turn a ship into the wind with her sails shortened, so that the vessel makes no headway. Sailors use this tactic to hold their position in the face of very strong winds.

Helm: The handle or tiller that con-trols the rudder.

Hold: The interior cavity of a ship.

In irons: A term that describes a ship

by punching holes in its hull below the waterline. Also known as scuttling.

Spar: A term that refers to any wooden support used in a ship's rigging.

Square-rigged: A term that describes any ship that has its principal sails extended on yards suspended at the middle horizontally from the mast.

Starboard: The right-hand side of a ship when looking at its bow.

Stern: The after end of a vessel.

Tack: Sailor's word for food.

Tack: To change the direction in which a sailing vessel moves to bring the wind to its opposite side. This zig-zag course allows the ship to sail against the wind.

Tiller: A wooden bar that fits into the round head of the rudder.

Transoms: The horizontal timbers fixed across the sternpost of a vessel to give it a flat stem.

Trim, to: To set the sails so as to make best use of the wind.

Windward: The side from which the wind blows (opposite of leeward).

Yard: The spar fastened horizontally or diagonally to the mast from which the sail is set.

Yardarm: The part of a yard that extends past the top comer of a square sail. Sailors were often hung from the yardarms as punishment.

Keith Strohm works in the TSR core AD&D group as a designer and editor, but some days he'd rather be a powder-monkey.

Offing: The safe distance between a ship and the land.

Overhaul: To pass another vessel. Sailing ships do not overtake each other but rather overhaul each other.

Pinch: To sail a vessel so close to the wind that she loses speed.

Pipe down: The order usually given by the boatswain (in the form of a whistle from a pipe) to indicate that all hands should turn in for the night.

Pitch: A mixture of coal and tar used to seal gaps between planks.

Pitch: To ride the water so that a wave lifts the bow of a ship and then the stem, so it tilts successively backward and then forward.

Poop: A raised deck aft of a ship.

Port: The left hand side of a ship when looking toward the bow.

Powder-Monkey: A ship's boy who carries gunpowder to the guns.

Quarterdeck: The afterpart of the upper deck before the poop.

Quay: A projection along the boundaries of a harbor provided for ships to lie alongside.

Quoin: A wedge pushed under the breech of a cannon to elevate or depress the muzzle.

Reef: To reduce the area of a sail by rolling up part of it and securing.

Rig: The arrangement of a ship's masts and sails.

Rigging: The system of ropes used to support the masts and handle the sails.

Rudder: The vertical plate beneath the waterline used to steer a ship.

Scupper: To sink a ship deliberately

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that is temporarily helpless and drifting.

Jib: A triangular sail set before the foremast.

Jury: Any temporary object used to get a disabled ship back to port; for example, a jury rig or a jury mast.

Keel: The lowest continuous timber that runs the length of a ship at its center.

Lateen sail: A triangular sail laced to the long yard. Lateen sailed ships were often used in the Mediterranean Sea.

Lee: The side of a ship away from the wind.

Leeway: The sideways drift off a set course occasioned by the wind.

List: A prolonged leaning of a ship to one side or another.

Mainsail: The principal sail of a vessel. The mainsail of a square-rigged ship is the lowest one on the mainmast.

Mast: A vertical pole that supports the sails.

Mizzen: The aftermost mast of a three-masted ship (or a two-masted ship if the foremost mast is the main mast).

Muster, to: To assemble all crew on deck.

Number One: A Royal Navy colloquialism referring to the First Lieutenant. In common parlance, the First Lieutenant is referred to as Jimmy-the-one.

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