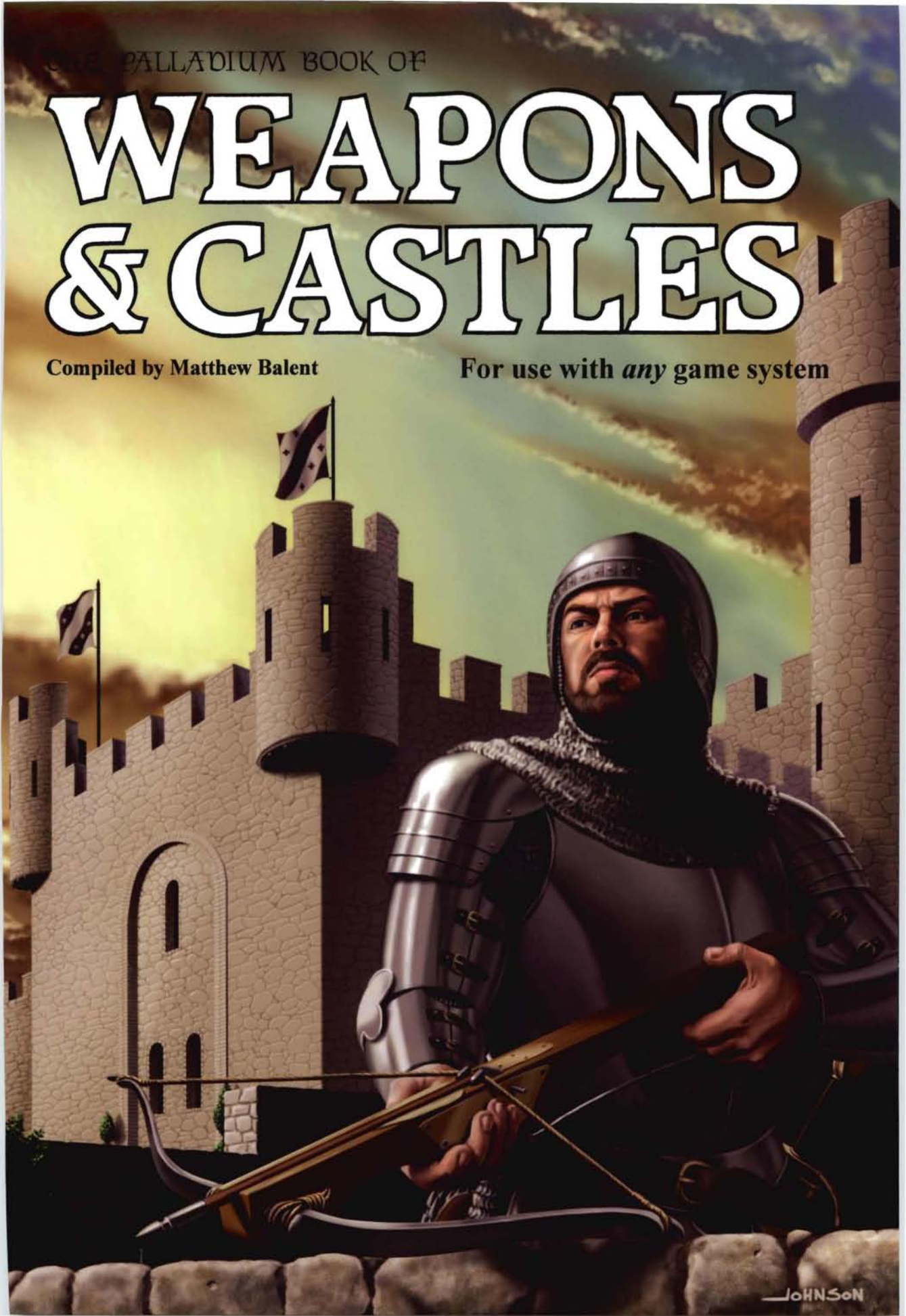
THE PALLADIUM BOOK OF

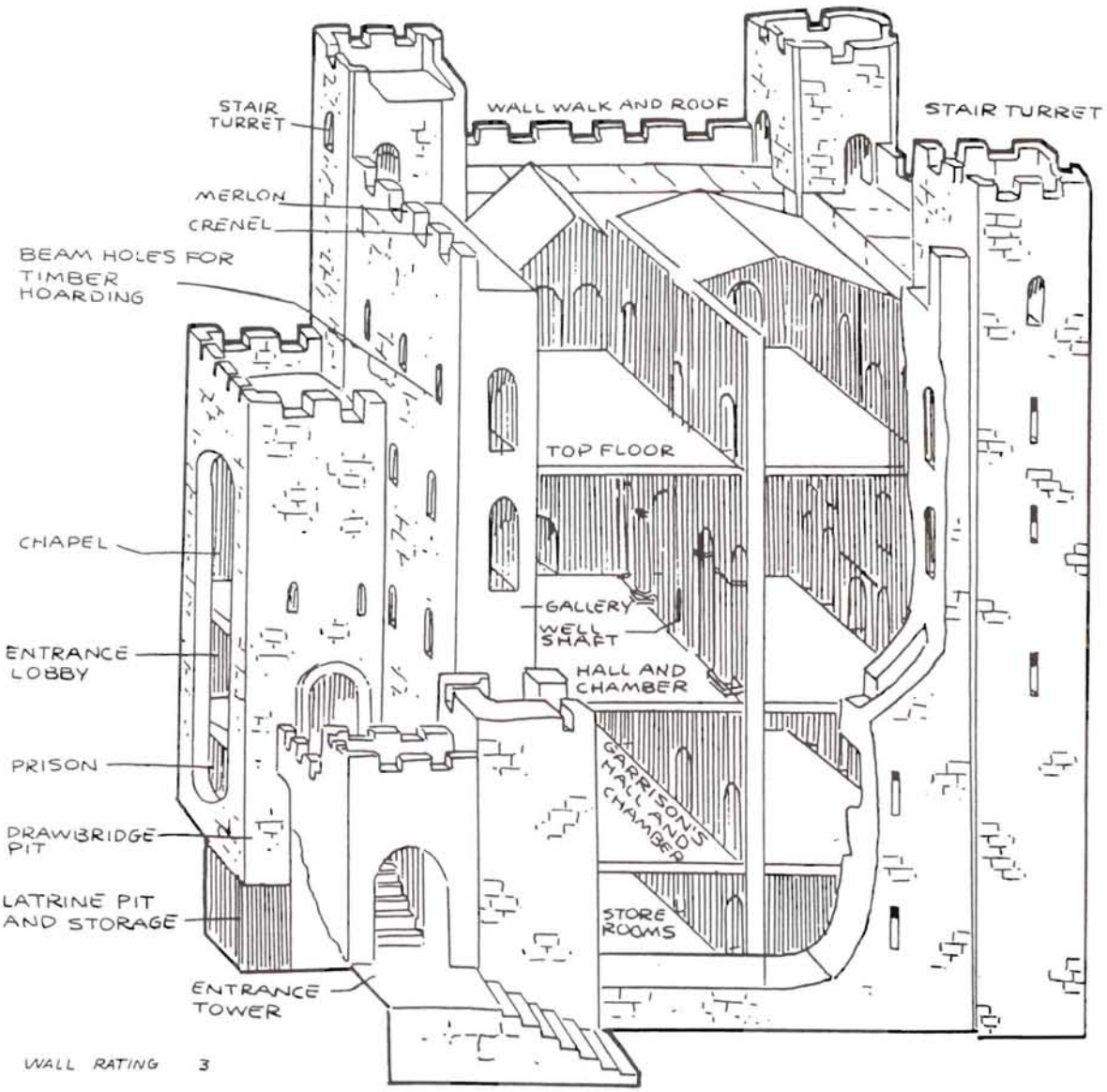
WEAPONS & CASTLES

Compiled by Matthew Balent

For use with *any* game system



Rochester Castle



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Palladium Books Presents:

Weapons & Castles

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Contents

For use with *any* game system

Missle Weapons

It is only fitting, after the initial success of the Weapons & Armour book, that I do one on missile weapons. In many fantasy games missile weapons are as grossly exaggerated as hand held arms. Too often are crossbows used as a medieval form of hand gun. One thing is generally accepted, however, that crossbows are slower than regular bows and shoot less arrows in the same amount of time.

In comparing crossbows and regular bows one comes across the following differences.

- the crossbow is more powerful than the bow.
- the crossbow needs less vertical space than the bow.
- because of its mass, a heavy crossbow is not good against a moving target.
- crossbows were very susceptible to water damage; steel crossbows with beeswax coated strings were somewhat waterproof.
- crossbows were easier to use by untrained people than bows but were harder to maintain.
- an average military crossbow, with windlass attachment, could fire one shot per minute; the average longbow could fire six times per minute.

The section on missile weapons is divided into three parts: bows, crossbows, and other.

BOWS

Bows can be put into groups based on the materials they are made from. The simplest bow is a single piece of wood; these are called "self bows". A bow made of several pieces of wood which are glued together is called a "built bow". A bow built with sinew stretched on the back is called a "backed bow". A bow made of wood, horn, and sinew is called a "composite bow".

The bows of most primitive peoples and those of most of western Europe are self bows. Backed bows were used in places where suitable wood could not be found. Built bows were not common but were most notibly used in Japan. Composite bows were used throughout the Middle East and Asia.

Each of the bows has the following data.

NAME - Self explanatory.
TYPE - The type of bow, self(S), built (BT), backed (BK), or composite (C).
LENGTH - The length of the bow from tip to tip in meters.
MASS - The mass of the bow in kilograms.
PULL - The force required to pull the bow in neutons. One kilogram (2.2 lbs.) is equal to 9.8 neutons (N).
EFFECTIVE RANGE - The maximum range at which one could reasonably expect to hit a target.
MAXIMUM RANGE - The longest range possible.

It should be noted that the power of any type of bow increases with its size up to a certain point, which varies for each. The shapes of arrows and the methods of release greatly effect performance. Each bow should use arrows designed for it and the correct release if it is to show its full power.

There are several different forms of arrow release. The primary, secondary, and tertiary are used by North American Indians and others with relatively light bows. The Mediterranean release is used throughout Europe and the Mediterranean. The Mongolian release is used throughout Asia and utilizes a ring worn on the thumb.

There is an arbitrary damage rating given for the missile weapons but the gamemaster should adjust it to suit his/her needs. The actual damage done by an arrow depends alot on the pull of bow, the range to the target, and the type of arrow. The ratings should be adjusted downward for longer ranges. An arrow hit is assumed to be a thrust if attack type is needed.

CROSSBOWS

The bow portion of crossbows was also made of various materials. The lightest crossbows are made of one piece of wood. Next in power comes crossbows backed with sinew and, even further, those of composite construction. The most powerful crossbows were constructed with steel.

Each entry has the following data.

NAME - Not only will the name of the weapon be here, but also the name of any drawing device it needs as well.
TYPE - The type of bow, wood (W), composite (C), backed (BK), or steel (S).
LENGTH - The length of the weapon along the stock.
MASS - The mass of the weapon in kilograms (2.2 lbs.= 1 kg.).
PULL - The force required to pull the bow in neutons. One kilogram (2.2 lbs.) is equal to 9.8 neutons.
EFFECTIVE RANGE - The maximum range at which one could reasonably expect to hit a target one has aimed at.
MAXIMUM RANGE - The longest range possible.
SHOTS PER MINUTE - The average number of shots per minute.

An average European crossbow arrow, called "bolts" or "quarrells", was about 30 centimeters long, 2 centimeters in diameter, and had a mass of 70 grams (2.5 oz.).

The most popular crossbows for use from horseback were the goat's foot types. Heavy arbalestes with a cranequin were also used when mounted.

It should also be noted that some crossbows, in the sixteenth century and later, were equipped with "safties" and could be kept cocked without the danger of accidental discharge.

NAME	TYPE	LENGTH	MASS	PULL	EFFECTIVE RANGE	MAXIMUM RANGE	DAMAGE
GREEK BOW	S	1.4M	.6kg	175N/ 40lbs	90M	120M	1

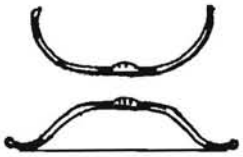
SCYTHIAN BOW	C	1.2M	.7kg	300N/ 70lbs	130M	300M	2

EGYPTIAN BOW	C	1.2M	.6kg	225N/ 50lbs	120M	200M	1

ASSYRIAN BOW	C	1.1M	.7kg	250N/ 55lbs	120M	225M	1

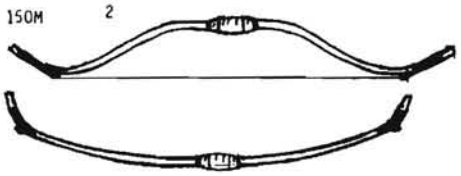
TURKISH BOW	C	1.0M	.8kg	300N/ 70lbs	150M	550M	2

This weapon may be used while mounted.



CHINESE BOW	C	1.9M	.7kg	350N/ 80lbs	100M	150M	2

Fires very long arrows, about 1.0 meter long.



JAPANESE BOW	BT	2.1M	.9kg	300N/ 70lbs	90M	180M	2

This weapon may be used while mounted.

LONG BOW	S	1.8M	.7kg	350N/ 80lbs	90M	275M	2

SHORT BOW	S	1.2M	.6kg	225N/ 50lbs	90M	225M	1

This weapon may be used while mounted.

APACHE BOW	BK	1.0M	.5kg	125N/ 30lbs	70M	110M	1

This weapon may be used while mounted.

MOHAVE BOW	S	1.7M	.7kg	175N/ 40lbs	70M	100M	1

This weapon may be used while mounted.

STONE BOW	S	1.7M	.7kg	250N/ 55lbs	45M	125M	1

Fires lead bullets.

After the bow and crossbow sections, there are only a few missile weapons left to be covered.

NAME	LENGTH	MASS	RANGE	SHOTS PER MINUTE	DAMAGE
SLING	varies- 1.0M	.1kg	100M	4	1

STAFF SLING	1.0M	.3kg	120M	4	1

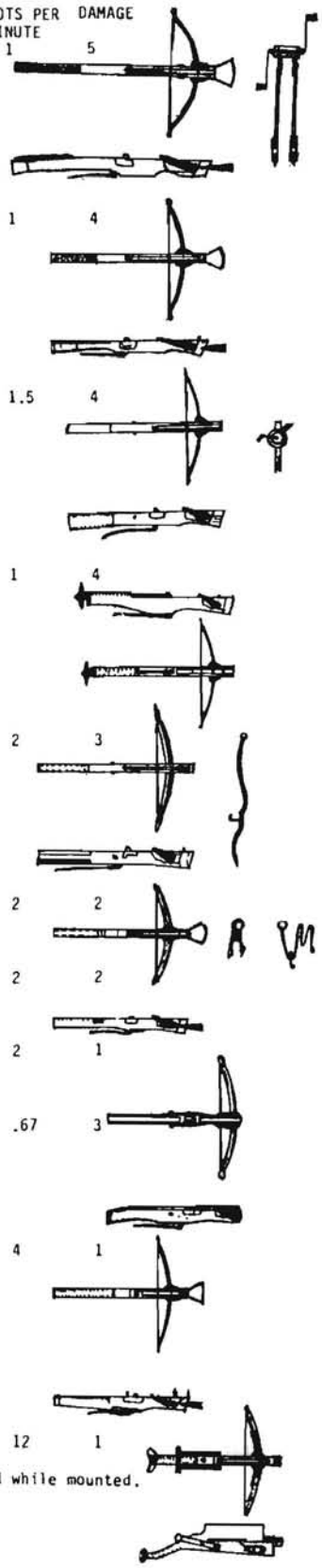
SPEARTHROWER	1.0M	.5kg	+50M	NA	+1

Used to increase the force behind a spear.

BLOWGUN	2.3M	.7kg	30M	4	.5

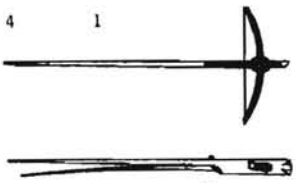
Mainly used in South America & Malaysia - darts .2M long; usually tipped with poison.

NAME	TYPE	LENGTH	MASS	PULL	EFFECTIVE RANGE	MAXIMUM RANGE	SHOTS PER MINUTE	DAMAGE
SIEGE ARBALEST (WINDLASS)	S	1.0M	8.2kg 2.0kg	5300N/ 1200lbs	COM	425M	1	5
HEAVY ARBALEST (WINDLASS)	S	.8M	7.0kg 1.5kg	3550N/ 800lbs	65M	330M	1	4
HEAVY ARBALEST (CRANEQUIN)	S	.7M	6.0kg 2.0kg	3300N/ 750lbs	55M	300M	1.5	4
This weapon may be used while mounted.								
HEAVY ARBALEST (SCREW & HANDLE)	S	.7M	7.5kg	3400N/ 760lbs	60M	330M	1	4
This weapon may be used while mounted.								
MEDIUM ARBALEST (GOAT'S FOOT)	C	.7M	3.8kg 1.0kg	675N/ 150lbs	50M	275M	2	3
This weapon may be used while mounted.								
MEDIUM ARBALEST (CLAW & BELT)	B	.7M	3.3kg .8kg	450N/ 100lbs	40M	275M	2	2
MEDIUM ARBALEST (CORD & PULLEY)	B	.7M	3.3kg .5kg	450N/ 100lbs	40M	275M	2	2
LIGHT ARBALEST	W	.7M	3.4kg	250N/ 55lbs	40M	225M	2	1
This weapon may be used while mounted.								
SLURBOW (CRANEQUIN)	S	.6M	6.0kg 2.0kg	3000N/ 675lbs	50M	300M	.67	3
This weapon may be used while mounted.								
STONE ARBALEST	S	.7M	3.4kg	200N/ 45lbs	30M	200M	4	1
This weapon may be used while mounted.								
CHU-KO-NU	W	.6M	3.2kg	250N/ 55lbs	60M	170M	12	1
Chinese repeating crossbow, fires 12 bolts in 15 seconds, may be used while mounted.								



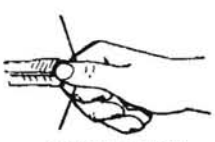
NAYIN	W	1.2M	3.2kg	200N/ 45lbs	30M	100M	4	1

African make, arrows .6M long.



THAMI	W	1.1M	4.0kg	250N/ 55lbs	40M	180M	4	1

Siamese



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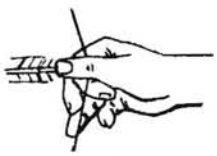

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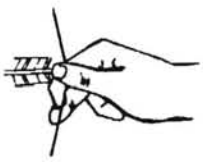
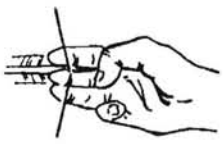


TERITARY RELEASE



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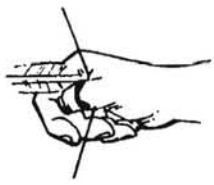
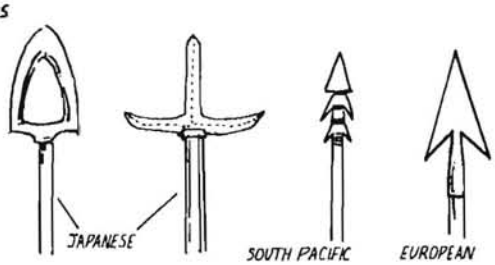
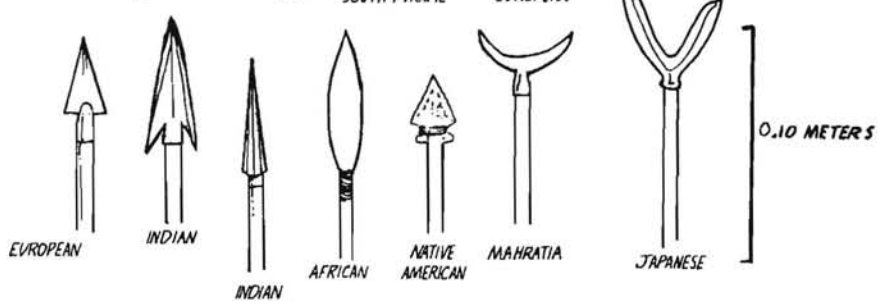


MONGOLIAN RELEASE

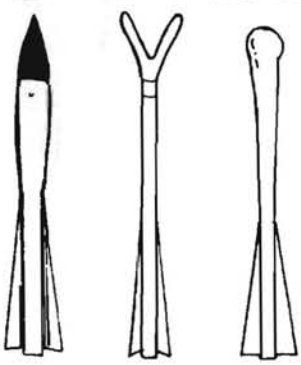
ARROW HEADS





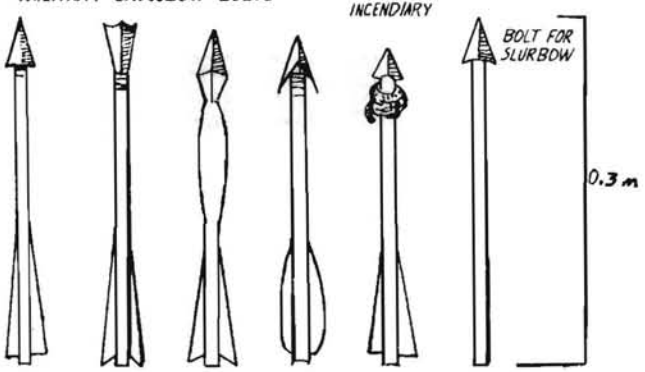
HUNT CROSSBOW BOLTS

DEER BIRDS SMALL GAME



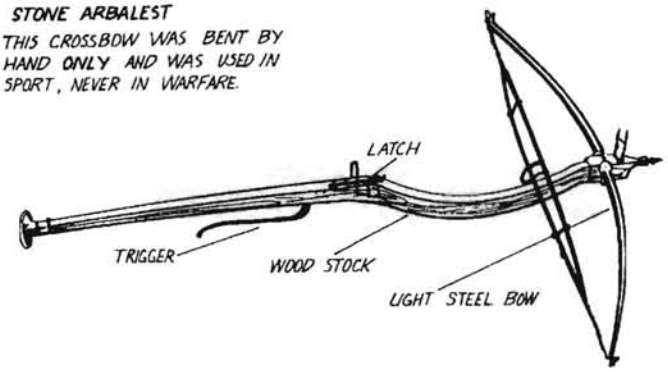
MILITARY CROSSBOW BOLTS

INCENDIARY



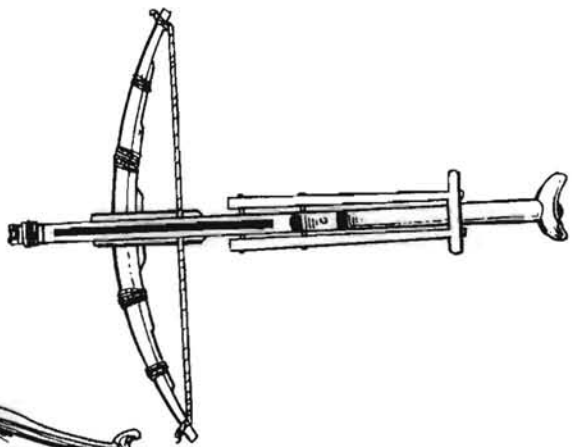
STONE ARBALEST

THIS CROSSBOW WAS BENT BY HAND ONLY AND WAS USED IN SPORT, NEVER IN WARFARE.

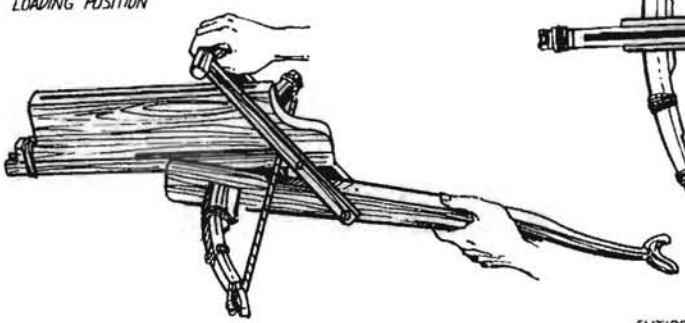


CHU-KO-NU CHINESE REPEATING CROSSBOW
COULD FIRE 12 BOLTS IN 15 SECONDS.

TOP VIEW

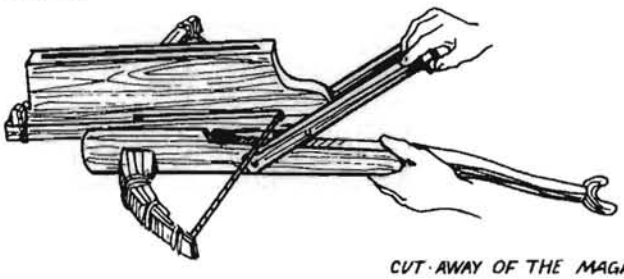


LOADING POSITION

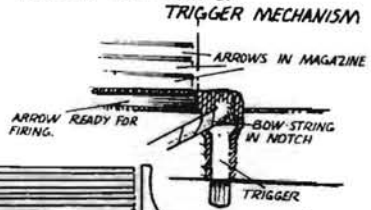


ENTIRELY CONSTRUCTED FROM BAMBOO.
DATE OF ORIGINAL CONCEPTION IS UNKNOWN, BUT IS QUITE ANCIENT.

READY TO FIRE



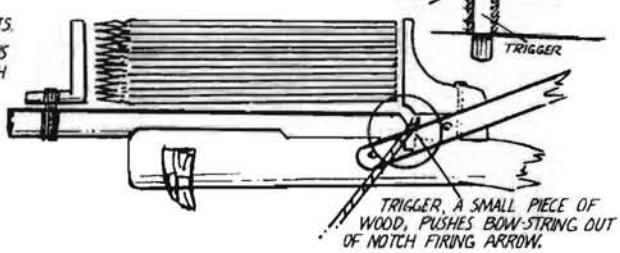
CLOSE-UP CUT-AWAY OF TRIGGER MECHANISM

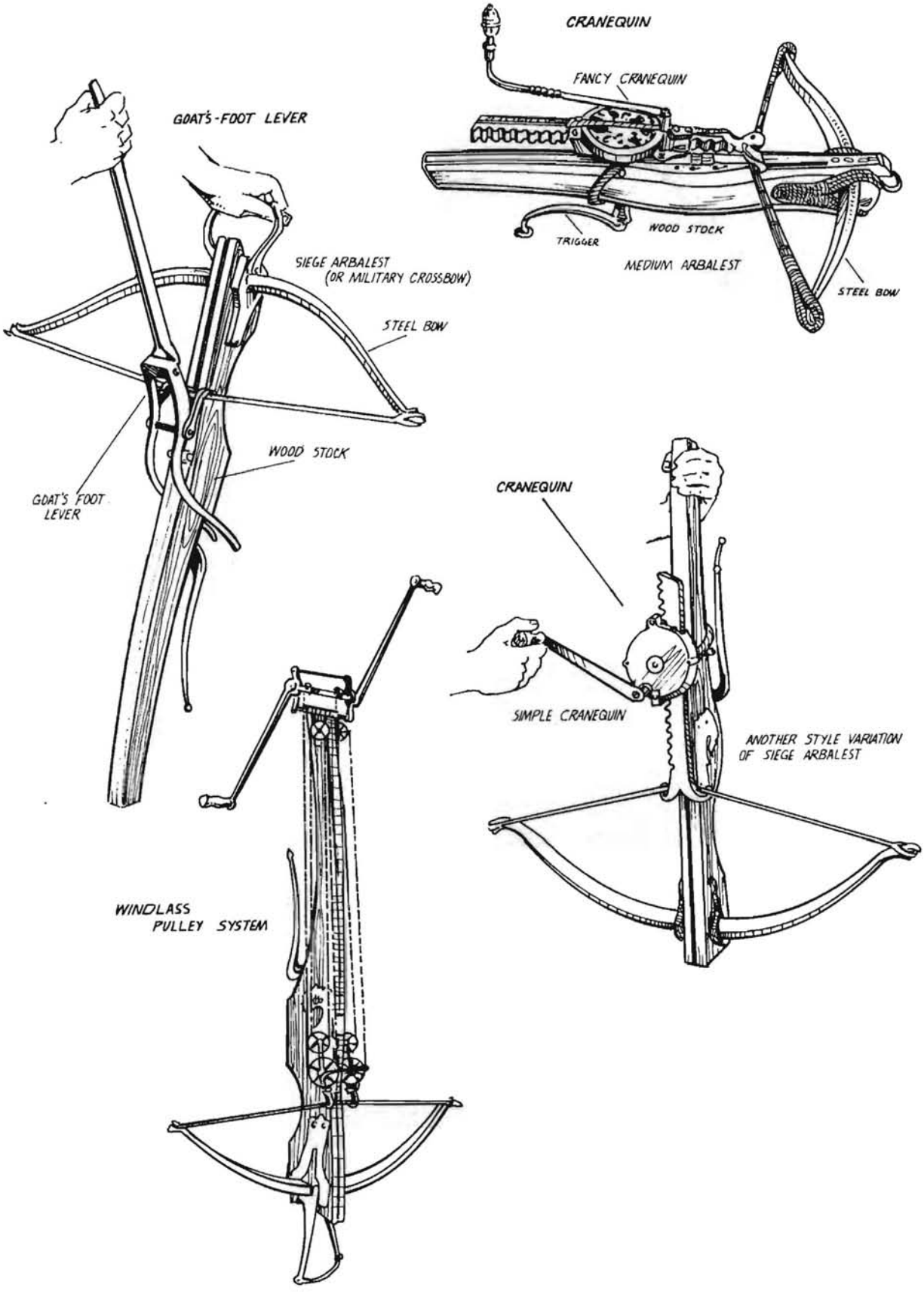


CUT-AWAY OF THE MAGAZINE

HOLDS 10 TO 12 BOLTS.

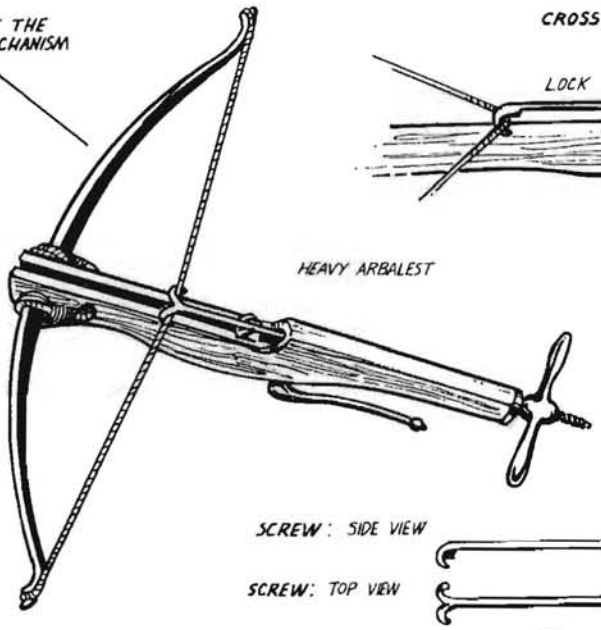
THESE SMALL LIGHT ARROWS WERE OFTEN SMEARED WITH POISON.




CRANEQUIN
FANCY CRANEQUIN
TRIGGER
WOOD STOCK
MEDIUM ARBALEST
STEEL BOW
GOAT'S-FOOT LEVER
SIEGE ARBALEST
(OR MILITARY CROSSBOW)
STEEL BOW
WOOD STOCK
GOAT'S FOOT
LEVER
CRANEQUIN
SIMPLE CRANEQUIN
ANOTHER STYLE VARIATION
OF SIEGE ARBALEST
WINDLASS
PULLEY SYSTEM

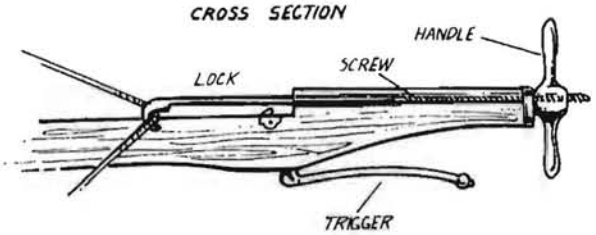
SCREW AND HANDLE

EXAMPLE OF THE CROSSBOW MECHANISM IN PLACE.



HEAVY ARBALEST

CROSS SECTION

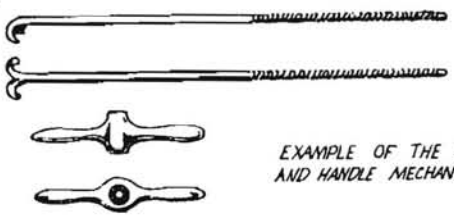


SCREW: SIDE VIEW

SCREW: TOP VIEW

HANDLE: SIDE

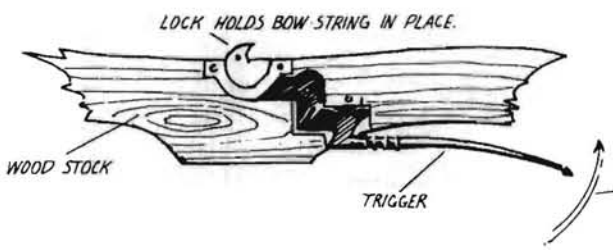
TOP



EXAMPLE OF THE SCREW AND HANDLE MECHANISM

CUT-AWAY
SIDE VIEW OF TRIGGER MECHANISM

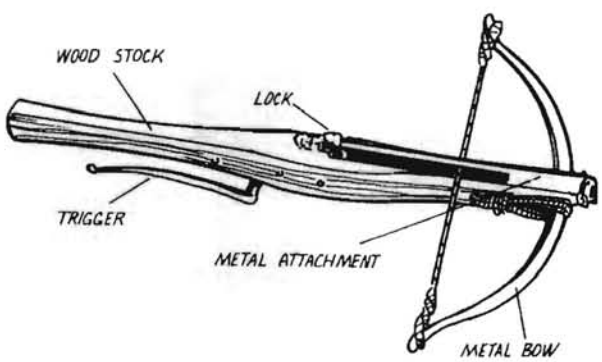
WHEN THE TRIGGER IS PRESSED UPWARDS TOWARD THE UNDERSIDE OF THE STOCK THE LOCK INSTANTLY RELEASES BOW STRING.



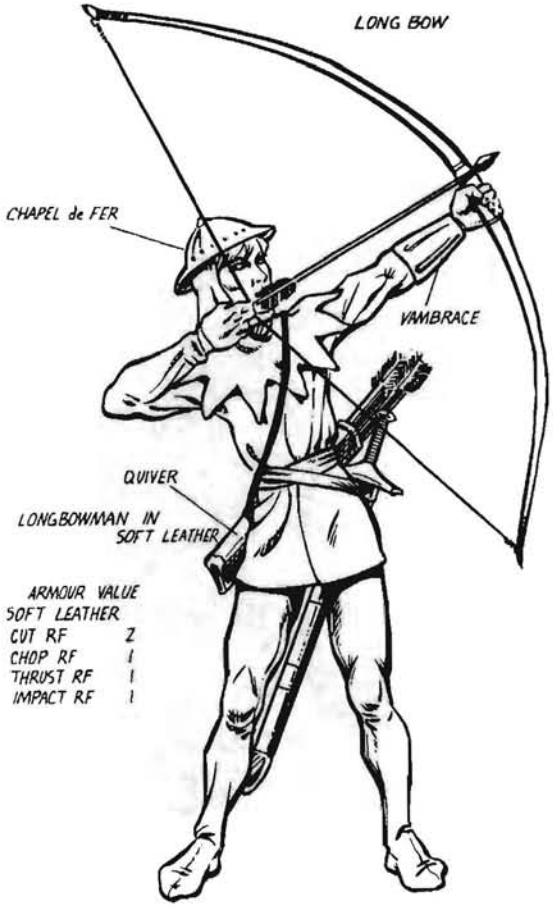
SLURBOW

WAS A CROSSBOW WITH A BARREL OF WOOD OR METAL ATTACHED TO ITS STOCK.

THIS WAS A LATE INNOVATION APPEARING ABOUT THE END OF THE 15th CENTURY.



LONG BOW

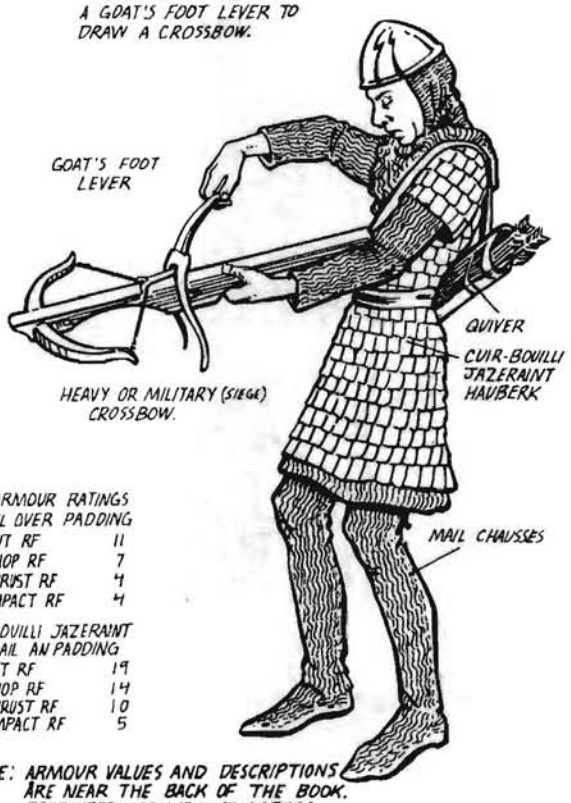


ARMOUR VALUE
SOFT LEATHER

CUT RF	2
CHOP RF	1
THRUST RF	1
IMPACT RF	1

GOAT'S FOOT LEVER

EXAMPLE OF THE USE OF A GOAT'S FOOT LEVER TO DRAW A CROSSBOW.



ARMOUR RATINGS
MAIL OVER PADDING

CUT RF	11
CHOP RF	7
THRUST RF	4
IMPACT RF	4

CUIR-BOUILLI JAZERAINT OVER MAIL AN PADDING

CUT RF	19
CHOP RF	14
THRUST RF	10
IMPACT RF	5

NOTE: ARMOUR VALUES AND DESCRIPTIONS ARE NEAR THE BACK OF THE BOOK. REPRINTED FROM THE PALLADIUM BOOK OF WEAPONS AND ARMOUR.

WINDLASS

EXAMPLE OF USING A A WINDLASS TO DRAW A CROSSBOW.

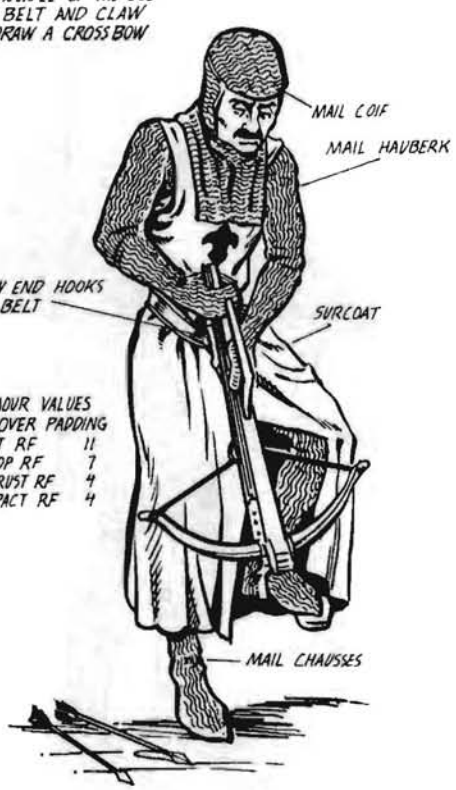
ARMOUR VALUES
SOFT LEATHER
SEE LONG BOWMAN ABOVE

LAMINATED PLATE OVER SOFT LEATHER

CUT RF	11
CHOP RF	10
THRUST RF	10
IMPACT RF	2

BELT AND CLAW

EXAMPLE OF THE USE OF A BELT AND CLAW TO DRAW A CROSSBOW

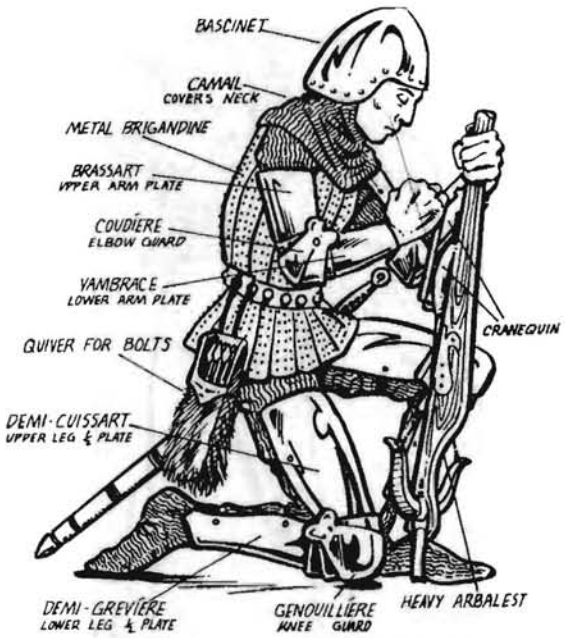


ARMOUR VALUES
MAIL OVER PADDING

CUT RF	11
CHOP RF	7
THRUST RF	4
IMPACT RF	4

CRANEQUIN

EXAMPLE OF THE USE OF A CRANEQUIN TO DRAW BACK A CROSSBOW.



ARMOUR VALUES (MAN)
METAL PLATE OVER MAIL AND PADDING

CUT RF	22
CHOP RF	18
THRUST RF	15
IMPACT RF	5

BRIGANDINE OVER MAIL AND PADDING

CUT RF	20
CHOP RF	16
THRUST RF	12
IMPACT RF	6

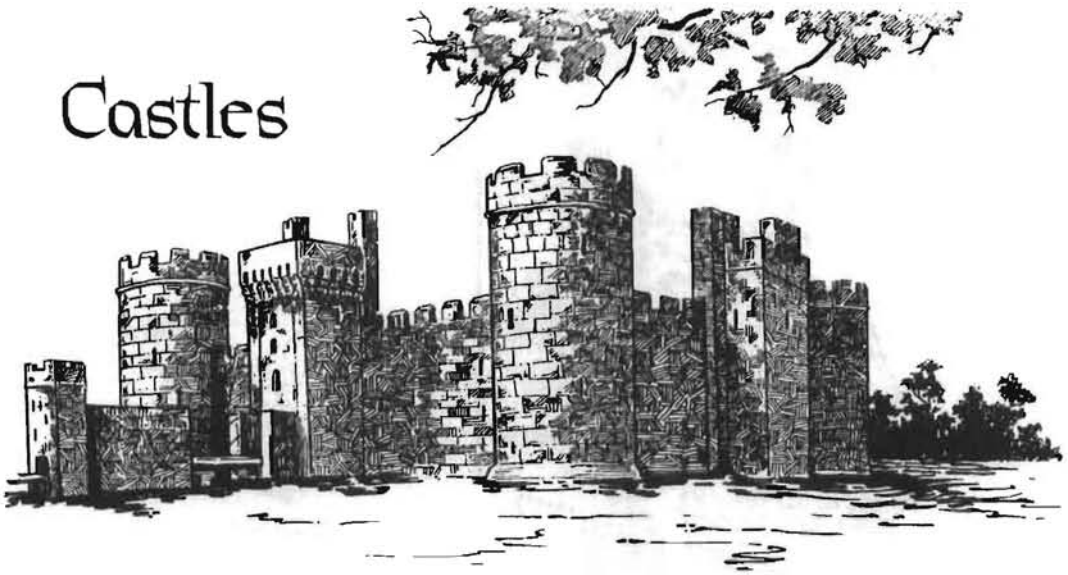
ROPE AND PULLEY

EXAMPLE OF THE USE OF A ROPE AND PULLEY TO DRAW A CROSSBOW.

ROPE ATTACHED TO BELT.

MAN IN MAIL AND PADDING ARMOUR

Castles



The earliest Medieval European castles built during the eleventh century, bore a great resemblance to the wooden stockades which were built along frontier America. Called "Motte and Bailey" castles, these structures consisted of a large mound (the motte) topped by a wooden tower. The tower was surrounded by a palisade and a ditch. The whole motte was in turn surrounded by an area for living quarters, stables, storage bins, etc. (the bailey) which was again surrounded by another palisade and a ditch. Although these castles could be built quickly, they were subject to fire and could be knocked down easily.

A logical outgrowth of the Motte and Bailey type of castle is the same type of structure only constructed of stone. At first only the tower was built of stone and was now called the donjon, or keep; a palisade of wood still surrounded this structure.

These early keeps were usually square and the ground floor, used for storage, had no outside door. Entrance was gained by a staircase which led to a door on the second level. The walls were on the average 4-5 meters thick and were up to 40 meters high. As the door was in plain view, you could not rush out and attack the besiegers. The windows were narrow as well, and could not adequately defend the corners of the structure from miners.

In the twelfth century, owing mainly to royal decrees, many of the smaller castles which had popped up everywhere were torn down. New castles were developed and built. The first great improvement was to replace the bailey palisade with a stone wall. Now sheds could be built inside the wall which helped free up some of the storage space of the keep. The entrance to the keep was moved to the ground floor as the main defense was now the outer walls. The base of the wall could still not be adequately defended, however, and it took the Crusades to introduce new improvements in castle building.

In the early thirteenth century, owing to new ideas brought back from the Crusades, many innovations were added onto existing castles and incorporated into new ones. Keeping besiegers away from the base of the walls as well as strengthening the walls themselves were the first improvements. Greater numbers of arrow slits were placed in the battlements to increase firepower. Covered wooden platforms, called hoardings, were placed on the front of the battlement walls. These allowed the defenders to drop stones and fire arrows through slots in the floor onto attackers. Later these defenses were called machicolations when they were built of stone.

The greatest additions were flanking towers which projected out from the bailey walls. These towers not only provided support for each other but also protected the base of the walls. The towers also divided the battlements into sections which would be sealed off if a portion of the wall was overrun.

With the increased use of mercenaries to garrison castles, the gatehouse of the castle began to increase in importance. Since the hired help was more likely to mutiny than loyal vassals, it was necessary for the lord to so strengthen the gate that it now took the place of the keep.

The keep-gatehouse eventually consisted of two towers joined together above the gateway. On each end of the passage was a portcullis and gate; arrow slits in the side walls and floor above the passage gave additional protection to the passage. The gatehouse itself could often only be entered on the first floor level from the ramparts.

Because these gatehouses were so strong, many castles had two main gates and two or three postern gates. This enabled those inside the castle to rally forth more easily and attack the besiegers. Sometimes additional outer walls were built from the gatehouse to further strengthen it; called barbicans, these walls could also have their own towers, gates, or moats.

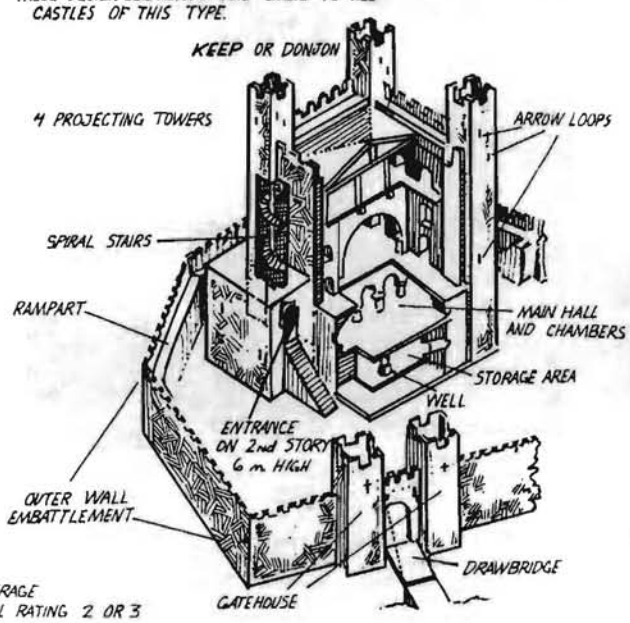
The last quarter of the thirteenth century was perhaps the greatest period for castle building. The concentric castle, similar to the ones developed in Syria by the Crusaders, consisted usually of a quadrangular structure of walls and towers surrounded in turn by a lower wall with its own towers. The area between the two walls was divided by cross walls to contain enemies to one area if a part of a wall was overrun. For the most part these castles were built upon the foundations and existing work of previous buildings.

Although the previous discussion provides a general outline for the development of all European castles, regional differences affected the architecture to some degree. The areas of Central Europe and Spain are where the main differences occur. Because of the near anarchy which prevailed in Central Europe the numerous free towns and the many minor nobles built alot of small castles to strengthen their holdings and trade routes. The mountainous terrain, as in South-Central Europe, tended to make the castles smaller than those of England and France.

One popular technique was to build a wall around a mountain peak and then build all the other buildings within this; these structures were small, expensive, and very secure. Another technique was to build the castle on a small piece of land sticking into a lake or river; the building could then be isolated by a wide moat. Simple keeps were also popular.

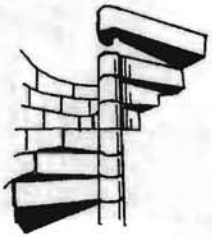
In Spain the keep became very popular and remained so until much later than the rest of Europe. The concentric design was utilized much later than the rest of the continent as well. It should be remembered that these structures were more for garrisons of Moors than for nobles.

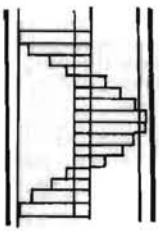
CUT·AWAY OF TRADITIONAL SQUARE KEEP
THESE DESIGN ELEMENTS ARE BASIC TO ALL CASTLES OF THIS TYPE.



AVERAGE WALL RATING 2 OR 3

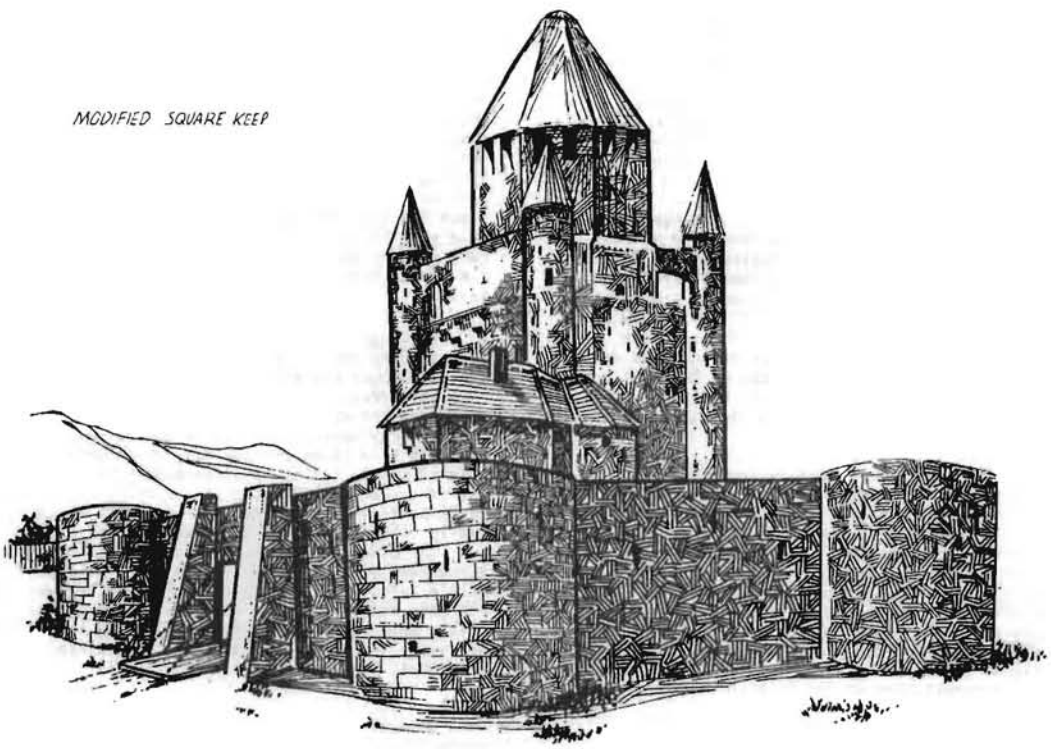
SPIRAL STAIRCASES



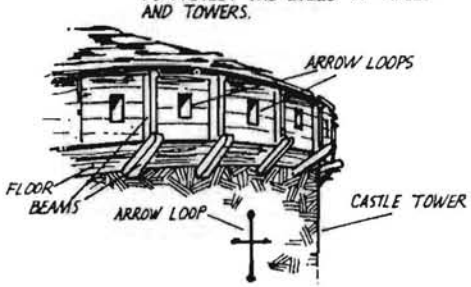


THESE WERE DESIGNED TO RUN IN A CLOCKWISE MANNER SO THAT ATTACKERS WOULD BE UNABLE TO USE THEIR SWORDS WHILE THE DEFENDER ABOVE COULD.

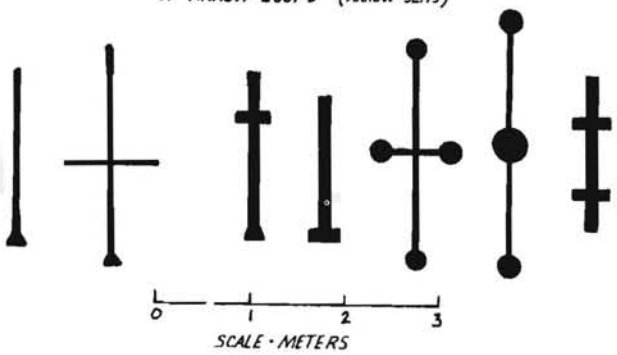
MODIFIED SQUARE KEEP



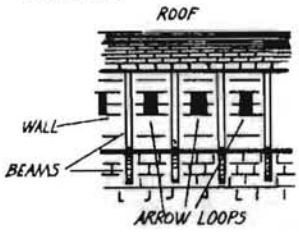
EXAMPLES OF HOARDING
TEMPORARY WOODEN GALLERIES TO PROTECT THE BASES OF WALLS AND TOWERS.



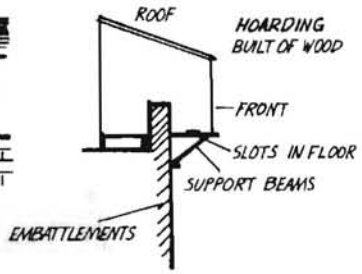
SILHOUETTE EXAMPLES TYPICAL OF ARROW LOOPS (ARROW SLITS)



FRONT VIEW

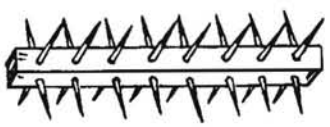


SIDE VIEW

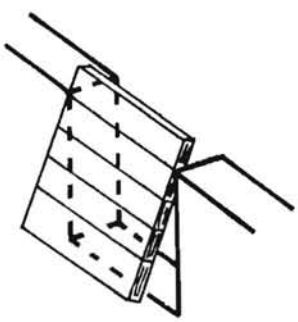


THESE WOOD STRUCTURES WERE PLACED ON CASTLES EMBATTLEMENTS IN TIMES OF WAR. THEY HAD SLOTS IN THE FLOOR TO FIRE ARROWS AND DROPPING THINGS (LIKE STONES AND BOILING LIQUIDS) THROUGH.

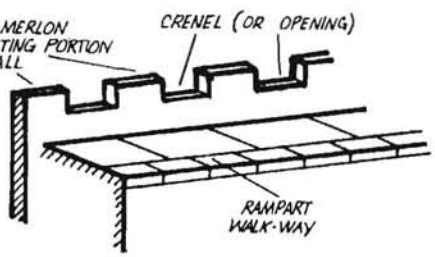
CHEVAL-DE-FRISE



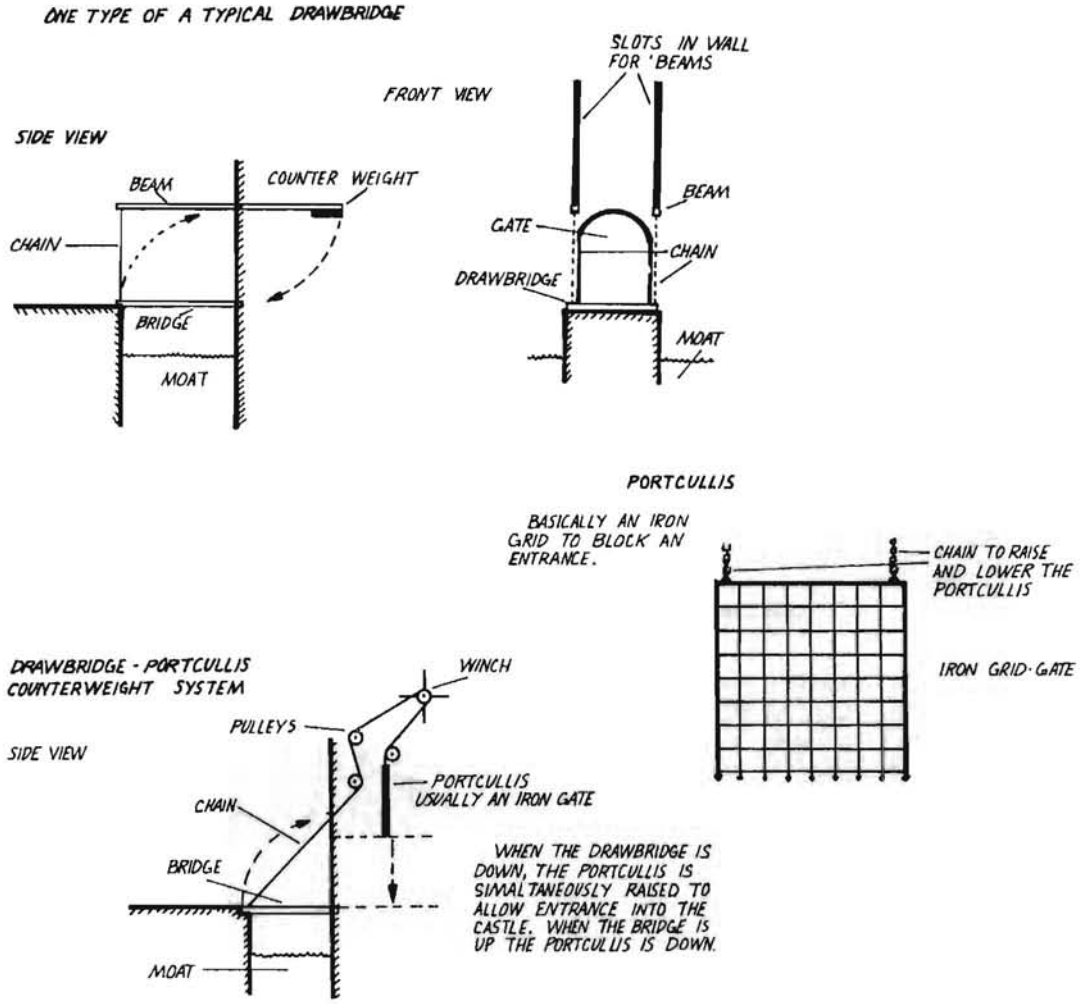
ROTATING WOODEN SHUTTER FITTED INTO CRENEL



CUT-AWAY EXAMPLE OF EMBATTLEMENT



EMBATTLEMENT IS A FORTIFIED WALL WITH MERLON CRENEL AND RAMPART.

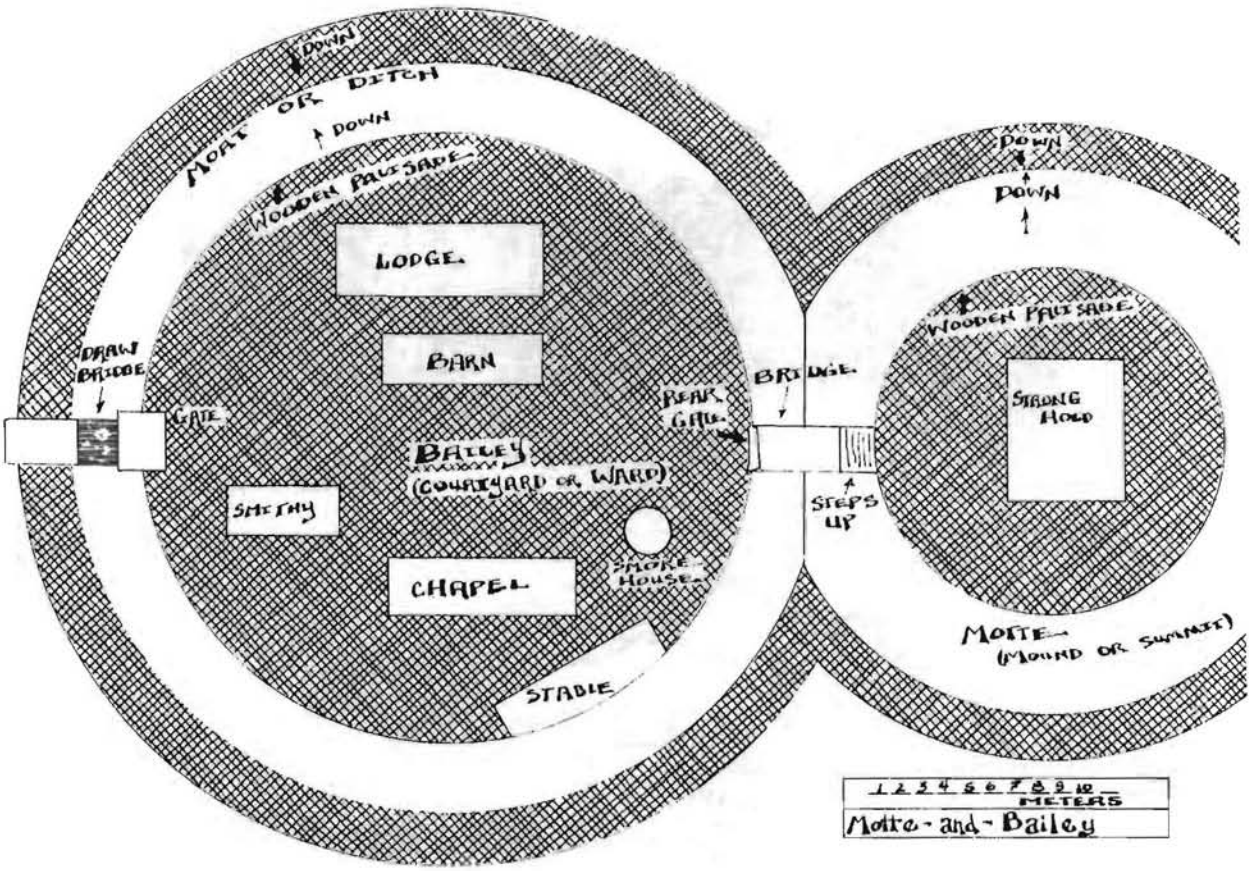


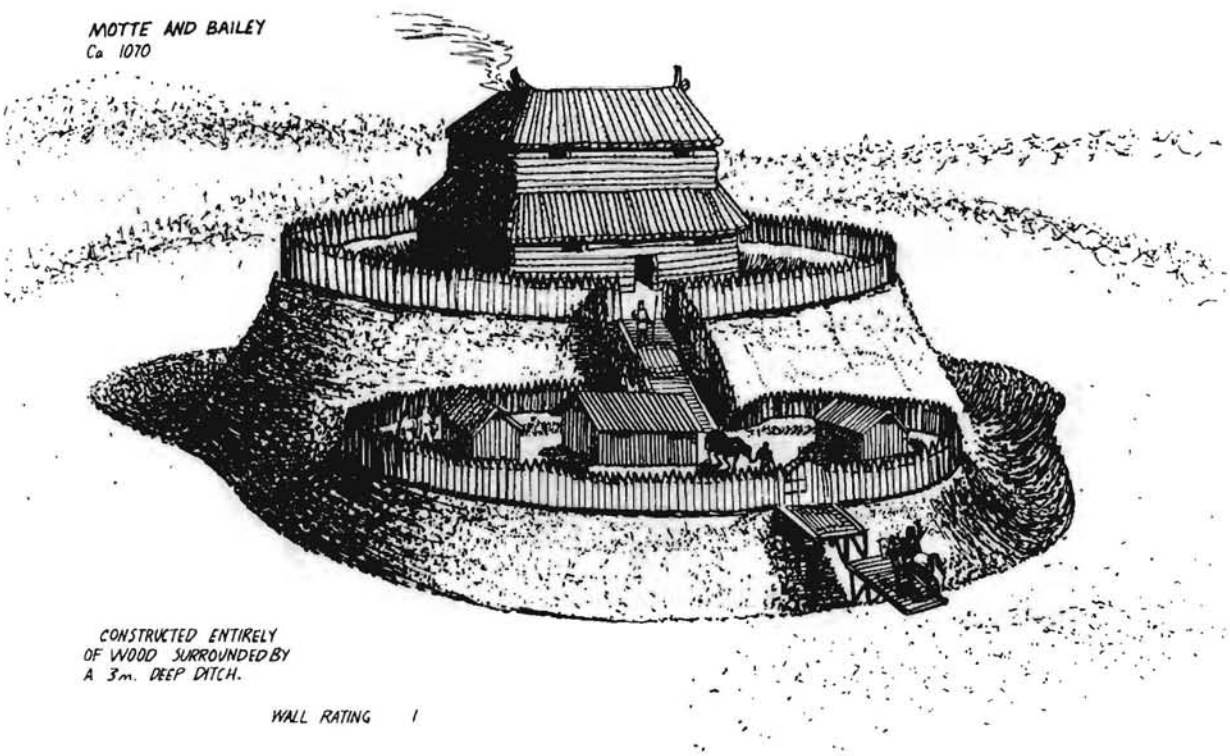
WALL RATING

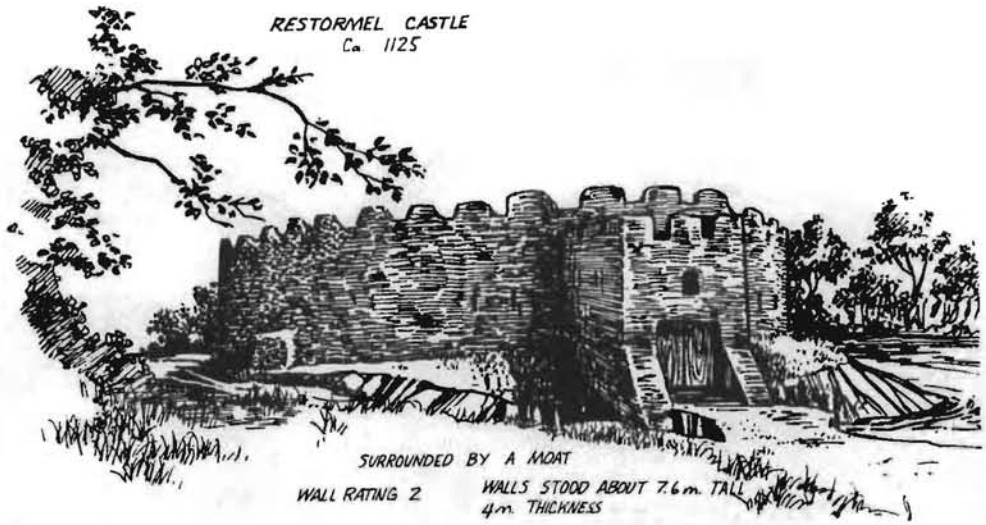
It is very difficult to evaluate fortifications in terms of damage resistance for use in fantasy type games. The table below gives a general idea of the strength of the wall but it must be remembered that this rating can be affected by materials and workmanship.

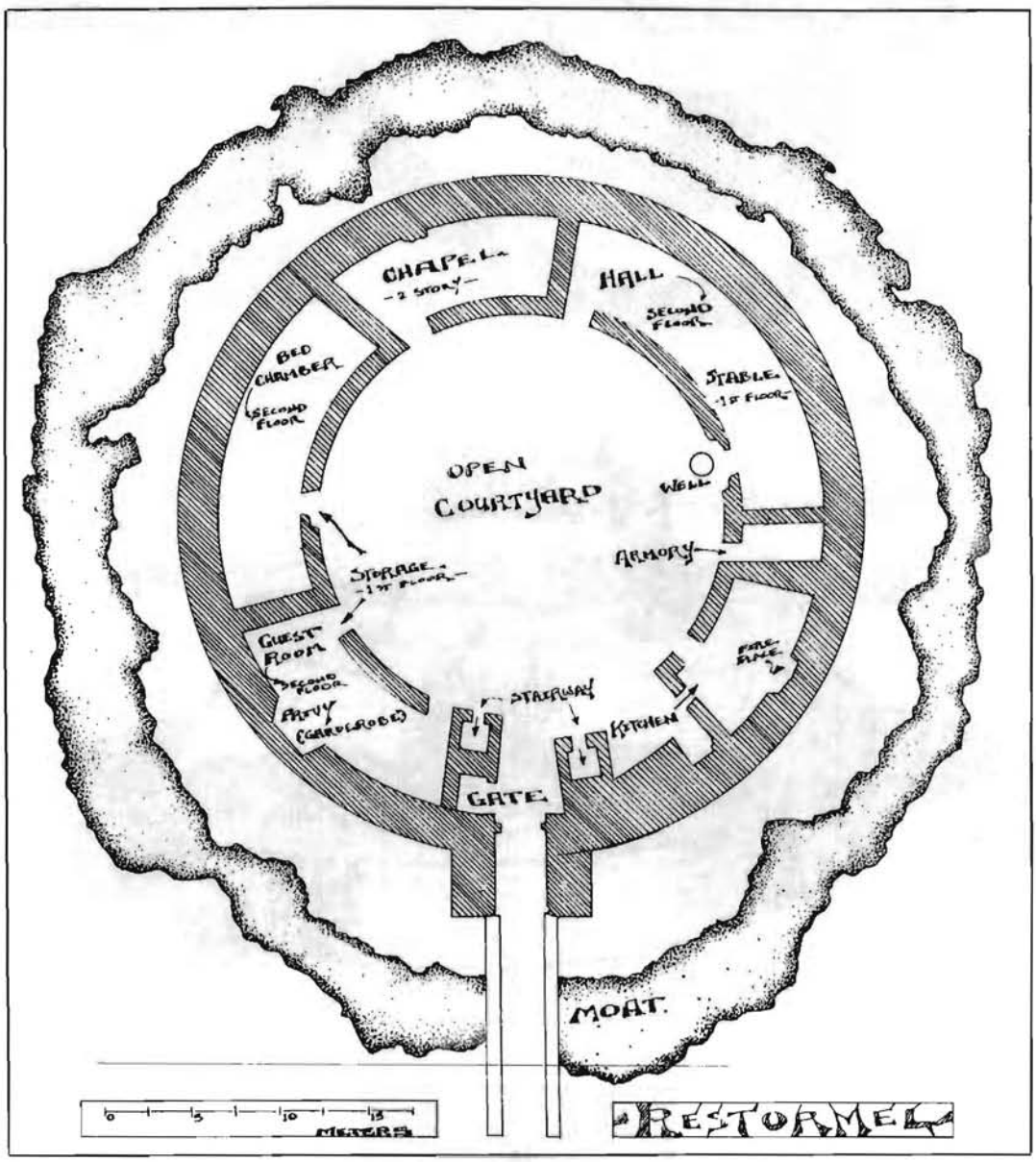
WALL RATING	THICKNESS	SMALL CATAPULT NUMBER OF HITS (5 kg stone)	HEAVY CATAPULT NUMBER OF HITS (20 kg stone)	TREBUCHET NUMBER OF HITS (250 kg stone)
1	2m	21- 40	11- 20	1- 4
2	5m	42- 80	21- 40	2-12
3	7m	62- 80	41- 60	3-18
4	10m	82-100	61- 80	4-24
5	13m	102-140	81-100	5-30

The hit numbers indicate how many hits would be needed to wreck a given wall. The hits would have to be in the same area of the wall to have any effect. Hits on the tops of embattlements would soon knock the merlons over.

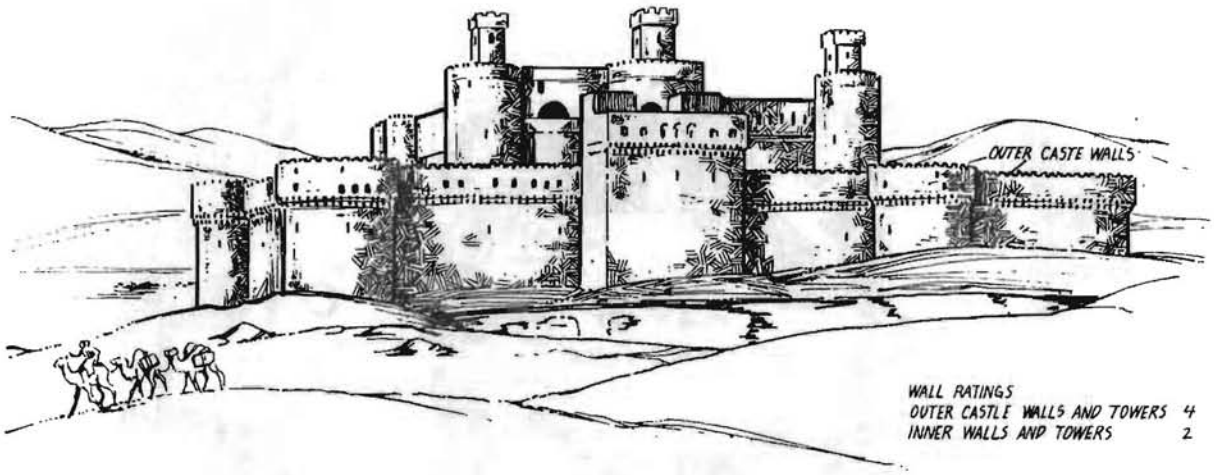

DOWN
MOAT OR DITCH
DOWN
WOODEN PALISADE
LODGE
BARN
DRAW BRIDGE
GATE
BAILEY
(COURTYARD OR WARD)
SMITHY
REAR GATE
BRIDGE
CHAPEL
SMOKE HOUSE
STABLE
STEPS UP
DOWN
DOWN
WOODEN PALISADE
STRONG HOLD
MOTTE
(MOUND OR SUMMIT)
1 2 3 4 5 6 7 8 9 10
METERS
Motte-and-Bailey


MOTTE AND BAILEY
Ca 1070
CONSTRUCTED ENTIRELY
OF WOOD SURROUNDED BY
A 3m. DEEP DITCH.
WALL RATING 1

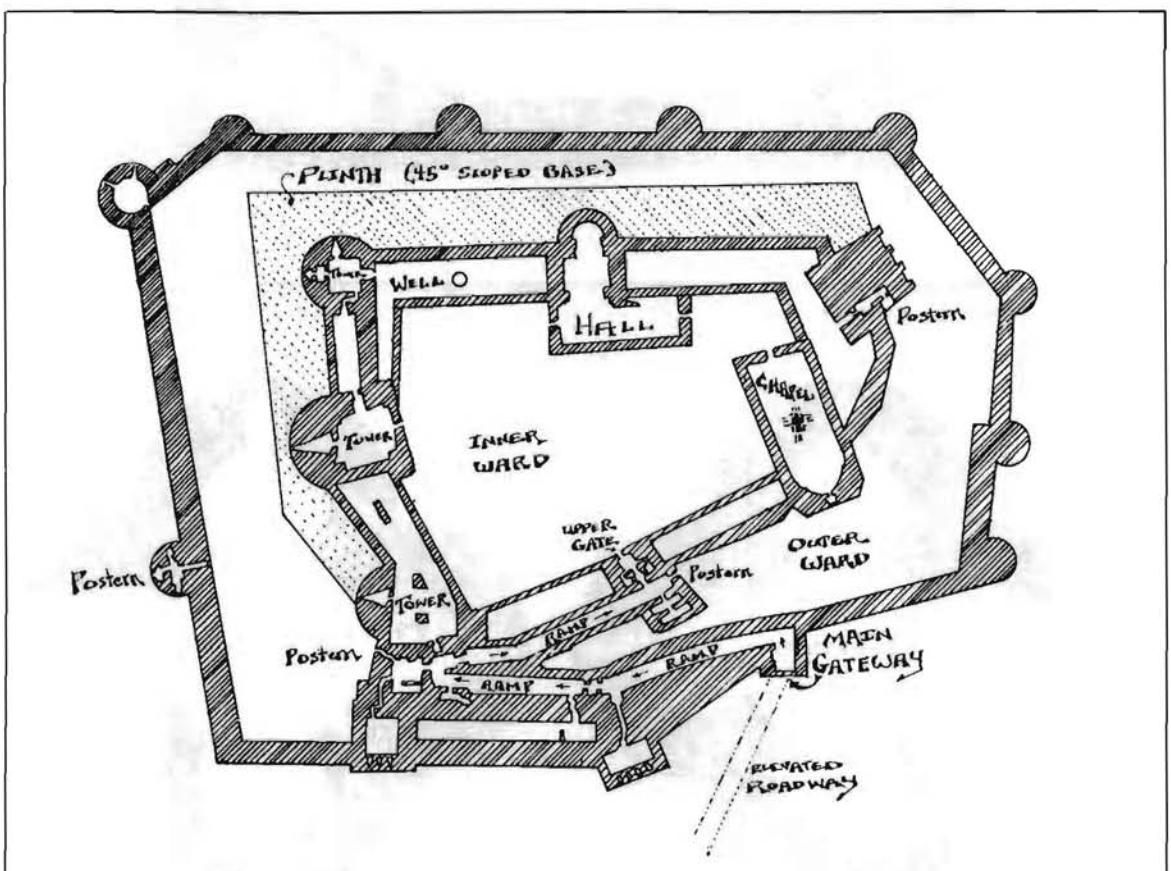

RESTORMEL CASTLE
Ca 1125
SURROUNDED BY A MOAT
WALL RATING 2
WALLS STOOD ABOUT 7.6m. TALL
4m. THICKNESS


CHAPEL
-2 STORY-
HALL
SECOND FLOOR
BED CHAMBER
(SECOND FLOOR
STABLE
-1ST FLOOR-
OPEN
COURTYARD
WELL
ARMORY
STORAGE
-1ST FLOOR-
GUEST ROOM
SECOND FLOOR
PRIVY
(GARDEROBE)
STAIRWAY
FIRE PLACE
KITCHEN
GATE
MOAT
0
5
10
15
METERS
RESTORMEL

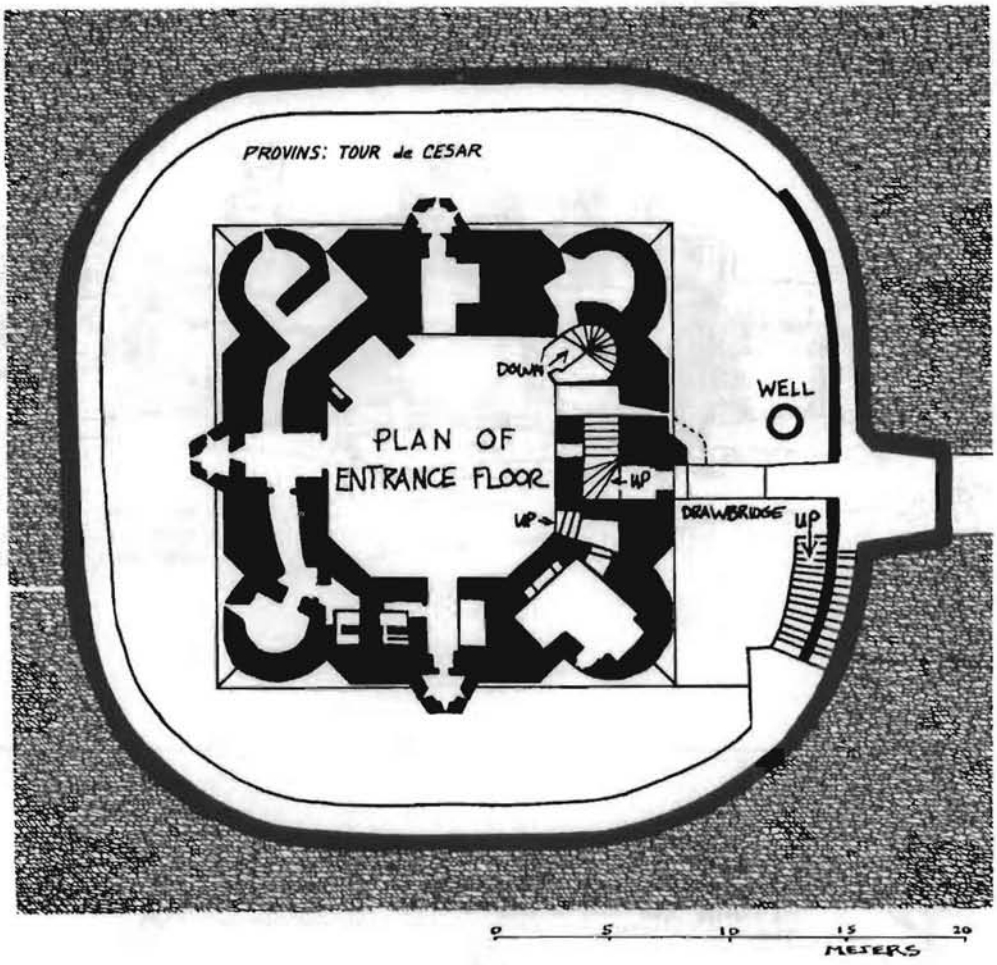
MODELLED AFTER
LE KRAK des CHEVALIERS
Ca 1140

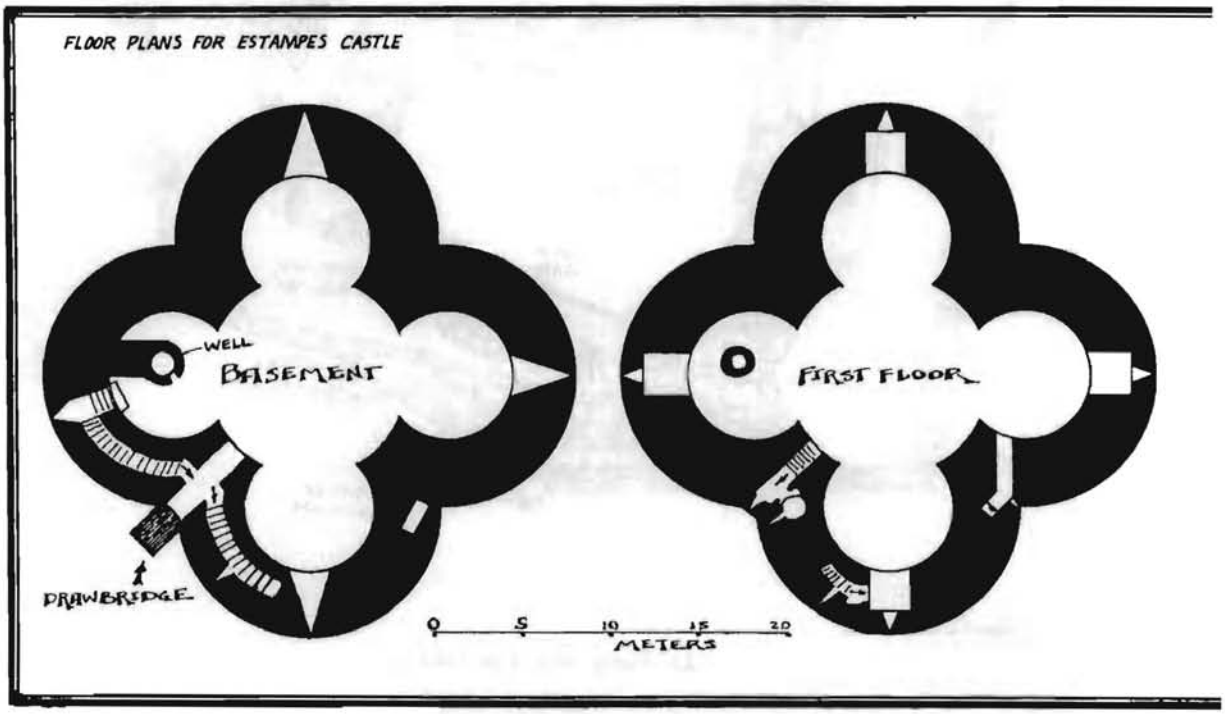


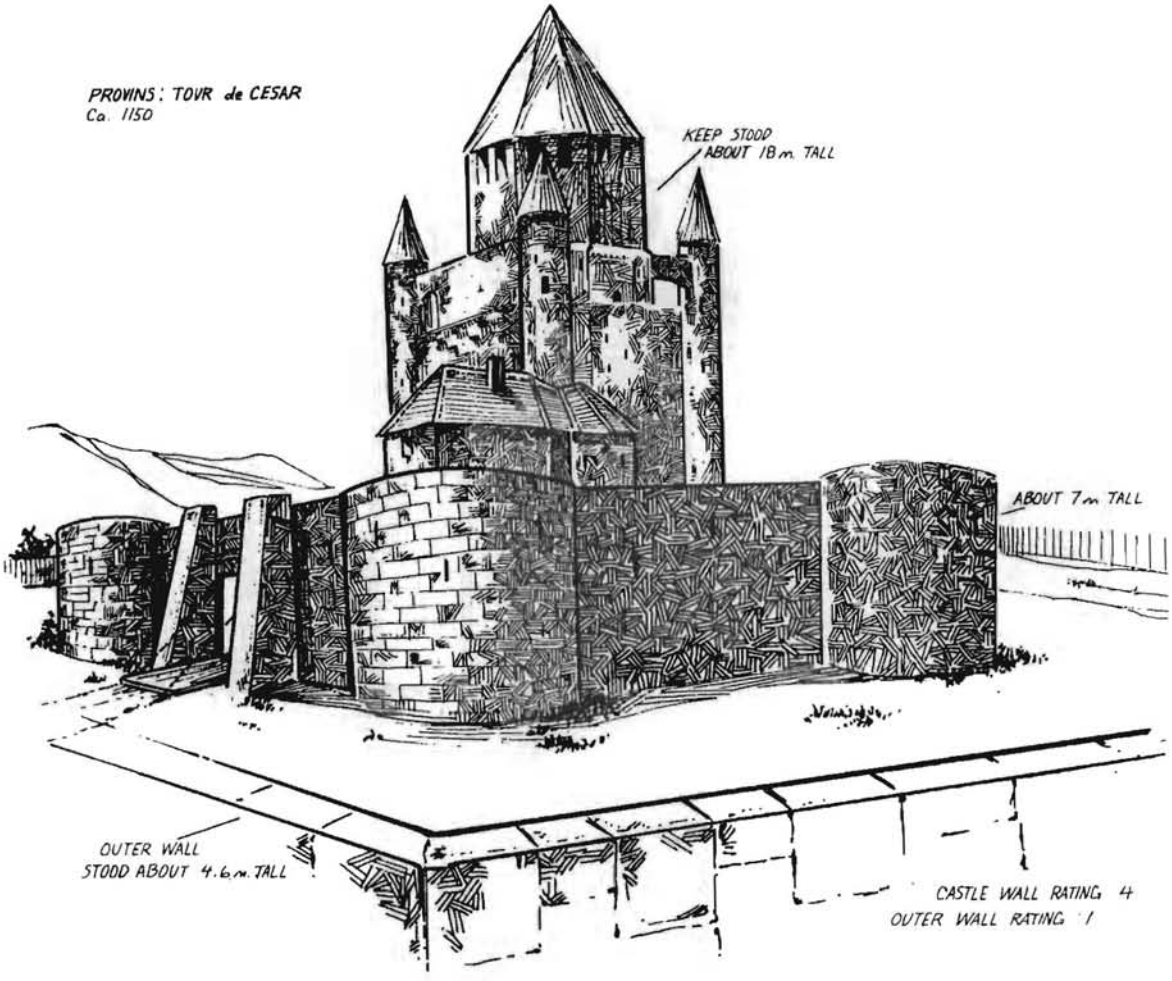
WALL RATINGS
OUTER CASTLE WALLS AND TOWERS 4
INNER WALLS AND TOWERS 2

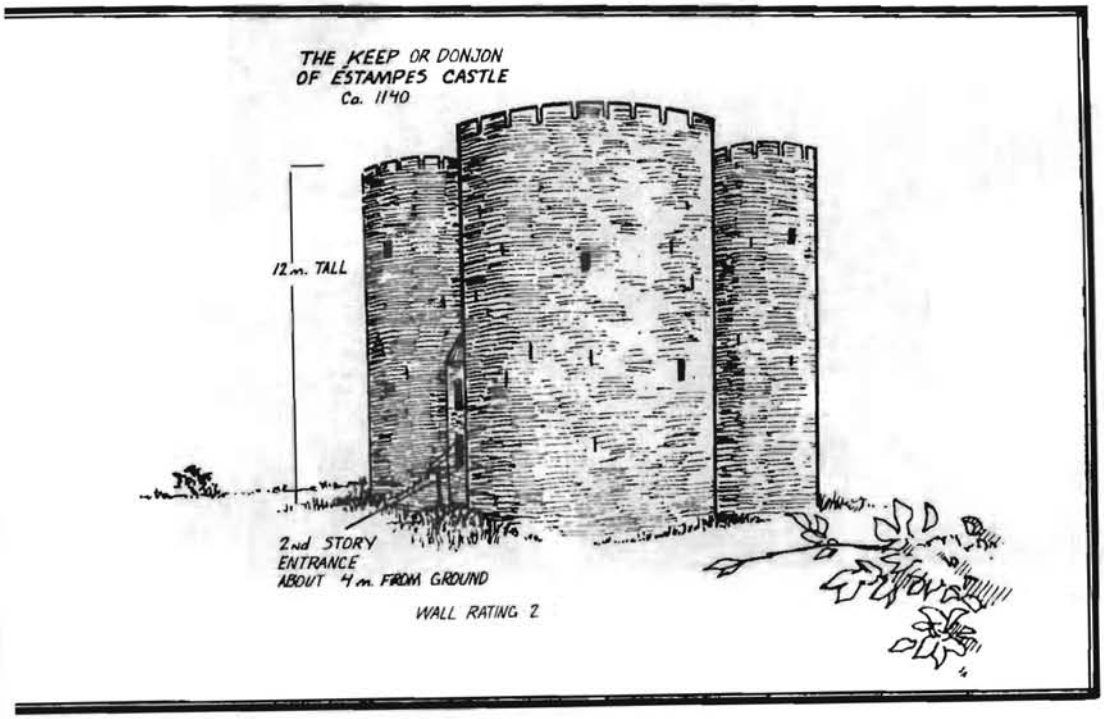


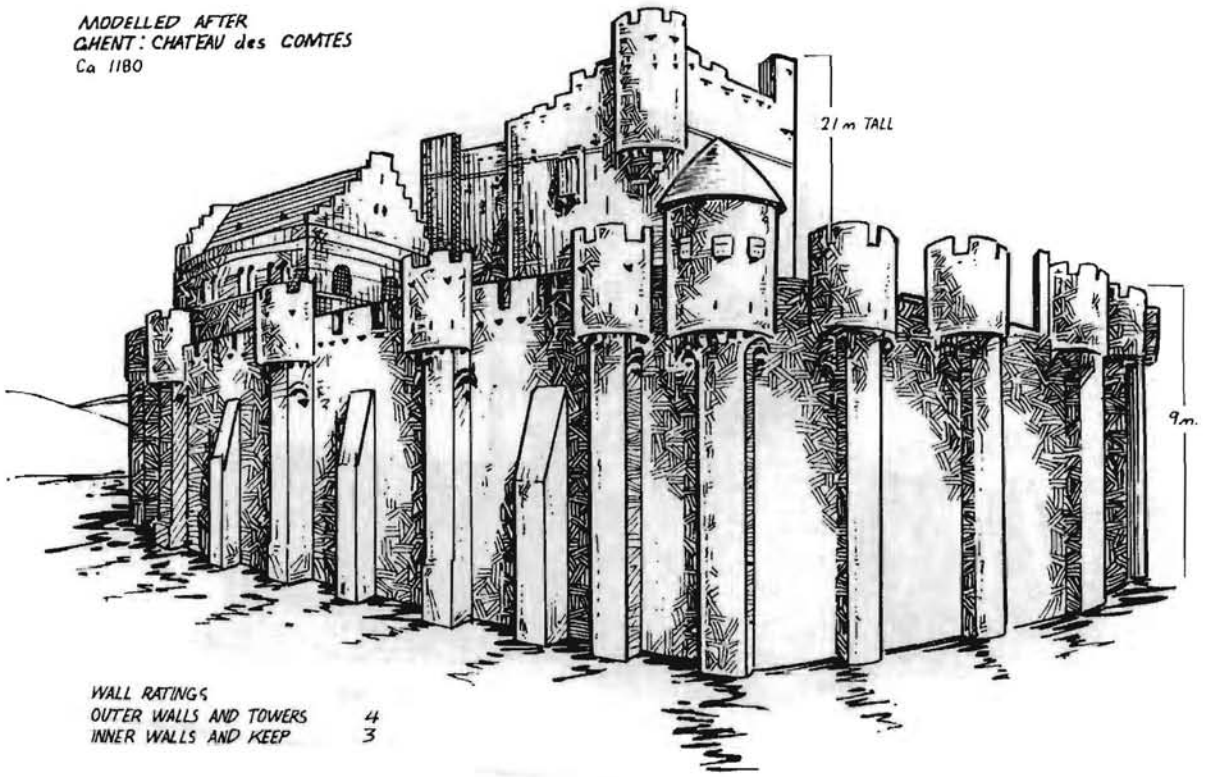
Le Krak des Chevaliers

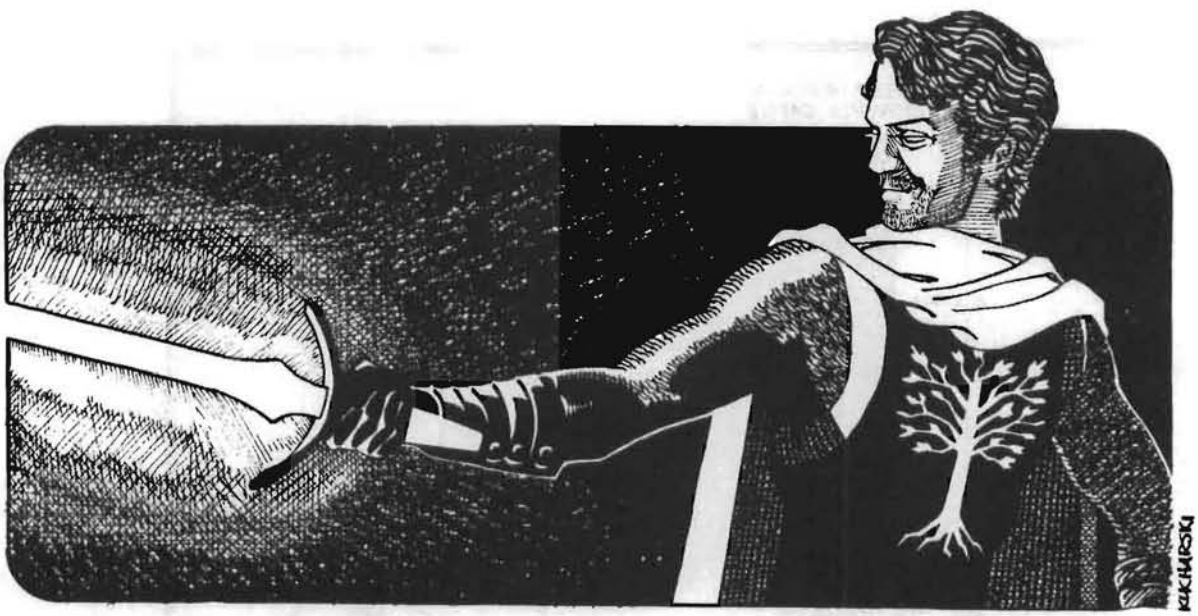

PROVINS: TOUR de CESAR
DOWN
WELL
PLAN OF
ENTRANCE FLOOR
UP
UP
DRAWBRIDGE
UP
0
5
10
15
20
METERS


FLOOR PLANS FOR ESTAMPES CASTLE
WELL
BASEMENT
FIRST FLOOR
DRAWBRIDGE
0
5
10
15
20
METERS

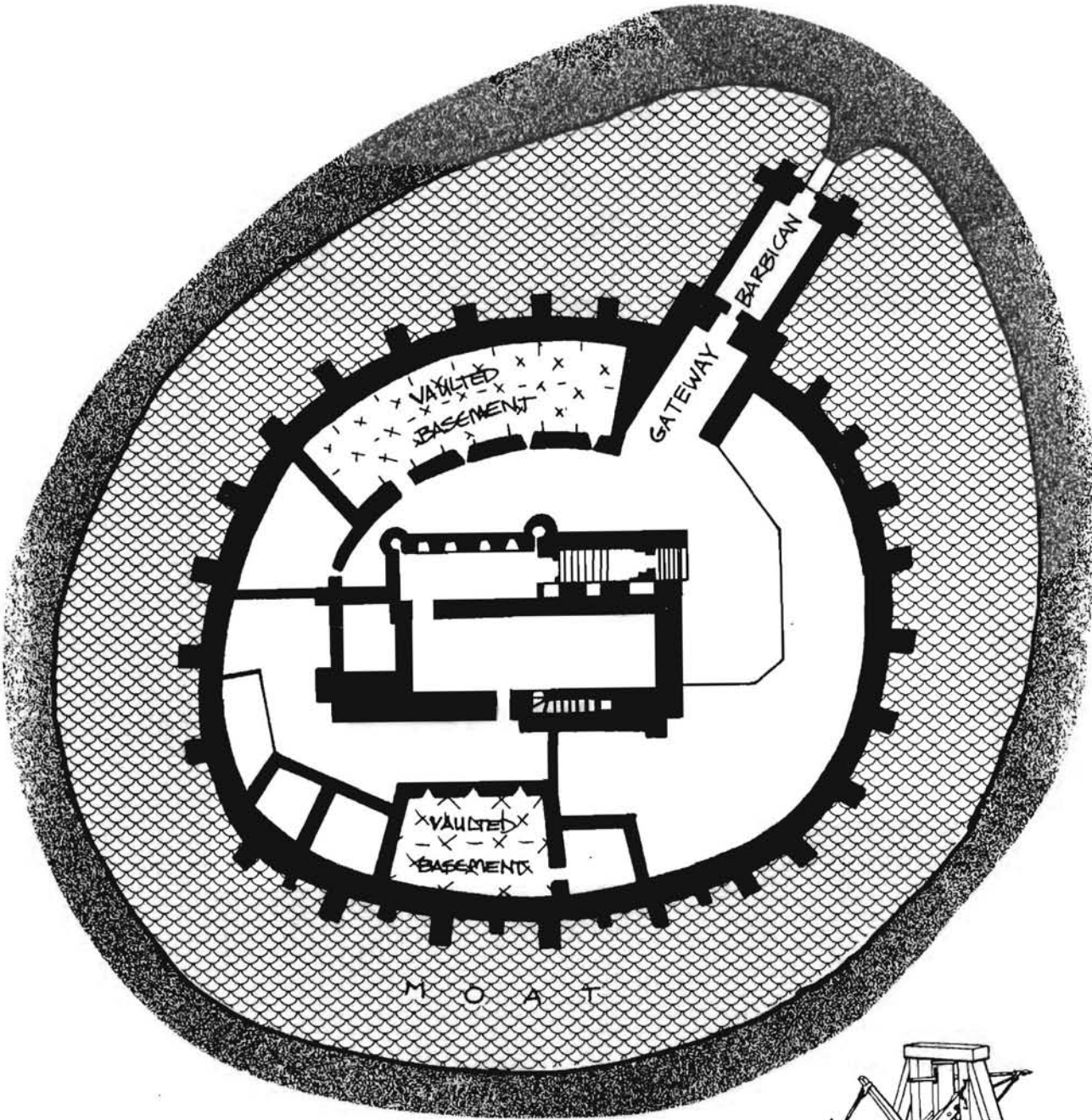

PROVINS: TOVR de CESAR
Ca. 1150
KEEP STOOD ABOUT 18m. TALL
ABOUT 7m TALL
OUTER WALL STOOD ABOUT 4.6m. TALL
CASTLE WALL RATING 4
OUTER WALL RATING 1


THE KEEP OR DONJON OF ESTAMPES CASTLE
Ca. 1140
12m. TALL
2nd STORY ENTRANCE ABOUT 4m. FROM GROUND
WALL RATING 2

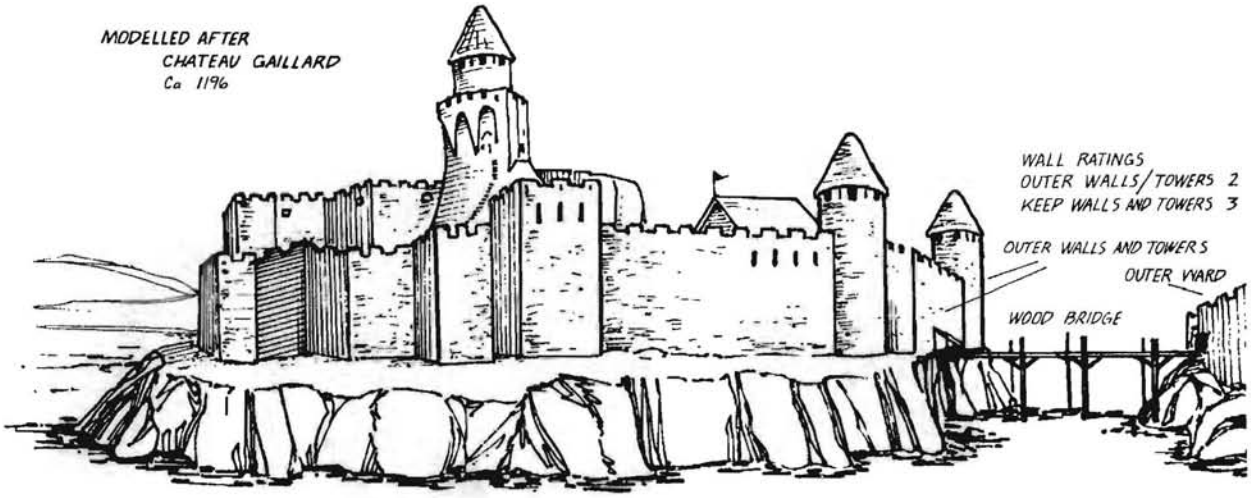

MODELLED AFTER
GHENT: CHATEAU des COMTES
Ca 1180
21m TALL
9m.
WALL RATINGS
OUTER WALLS AND TOWERS 4
INNER WALLS AND KEEP 3

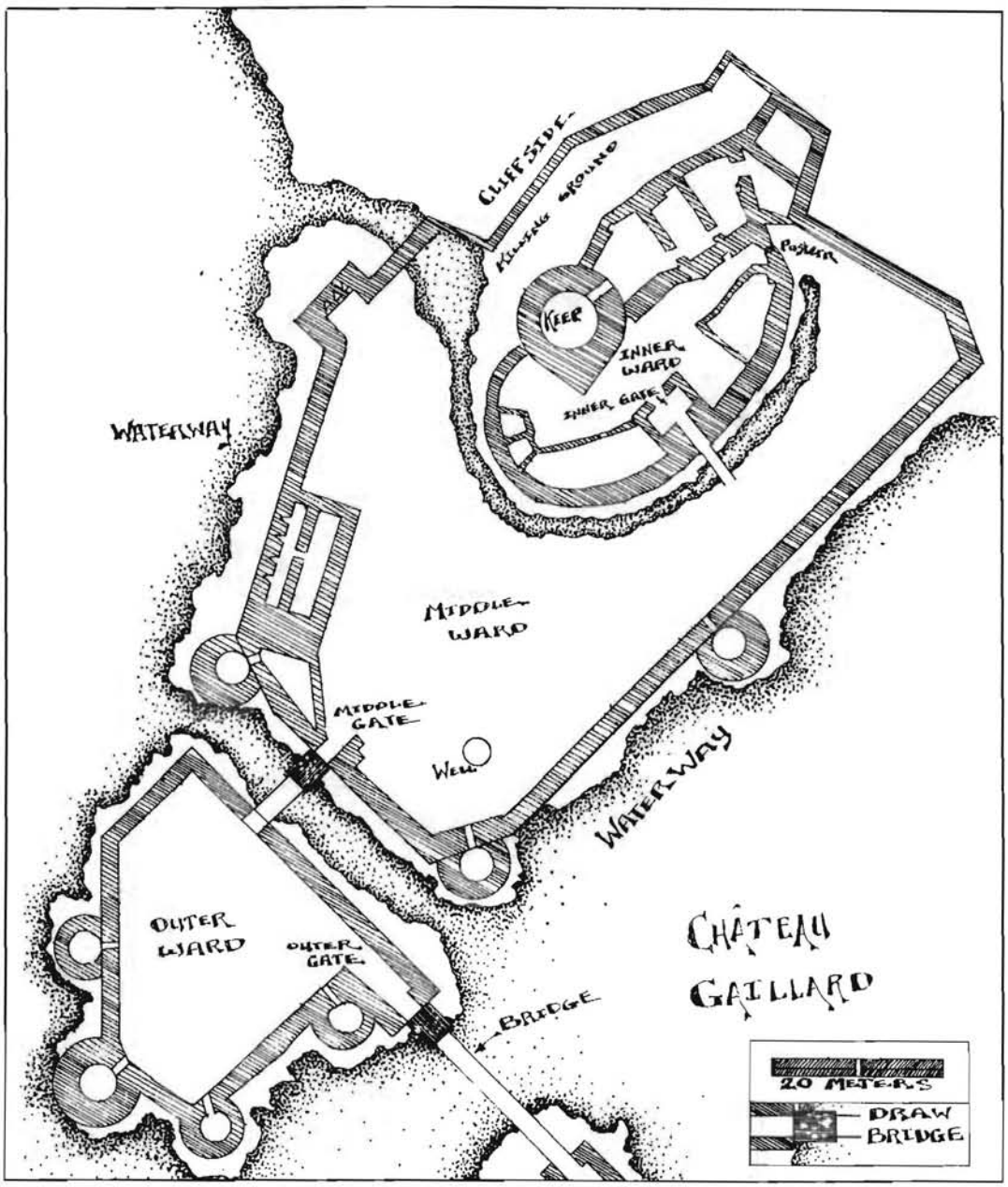

KIKUHASKI

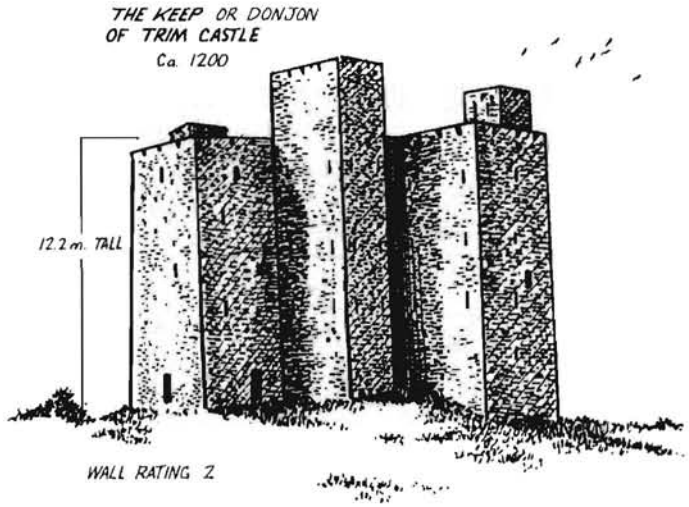
GHENT: CHATEAU DES COMTES

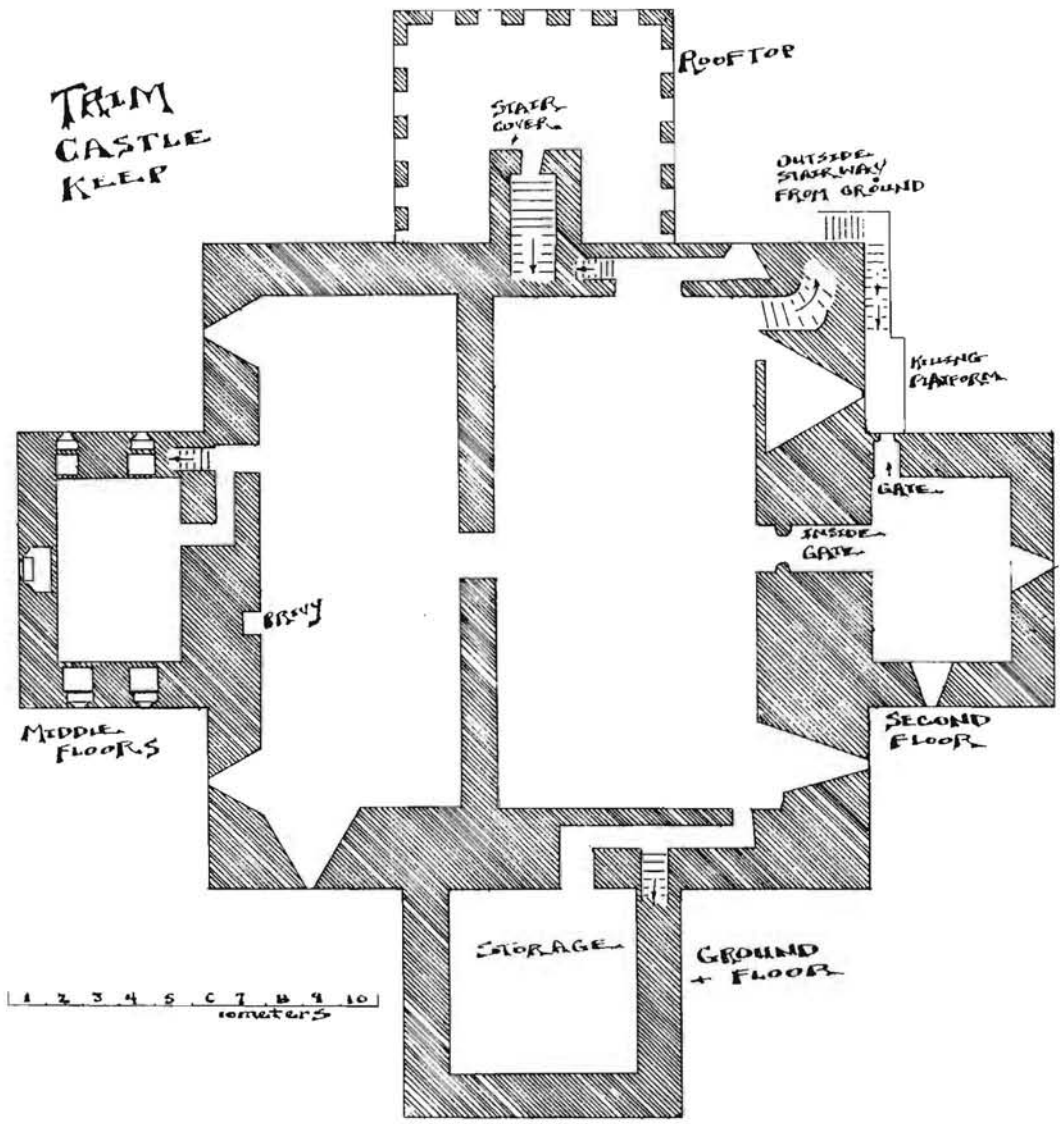


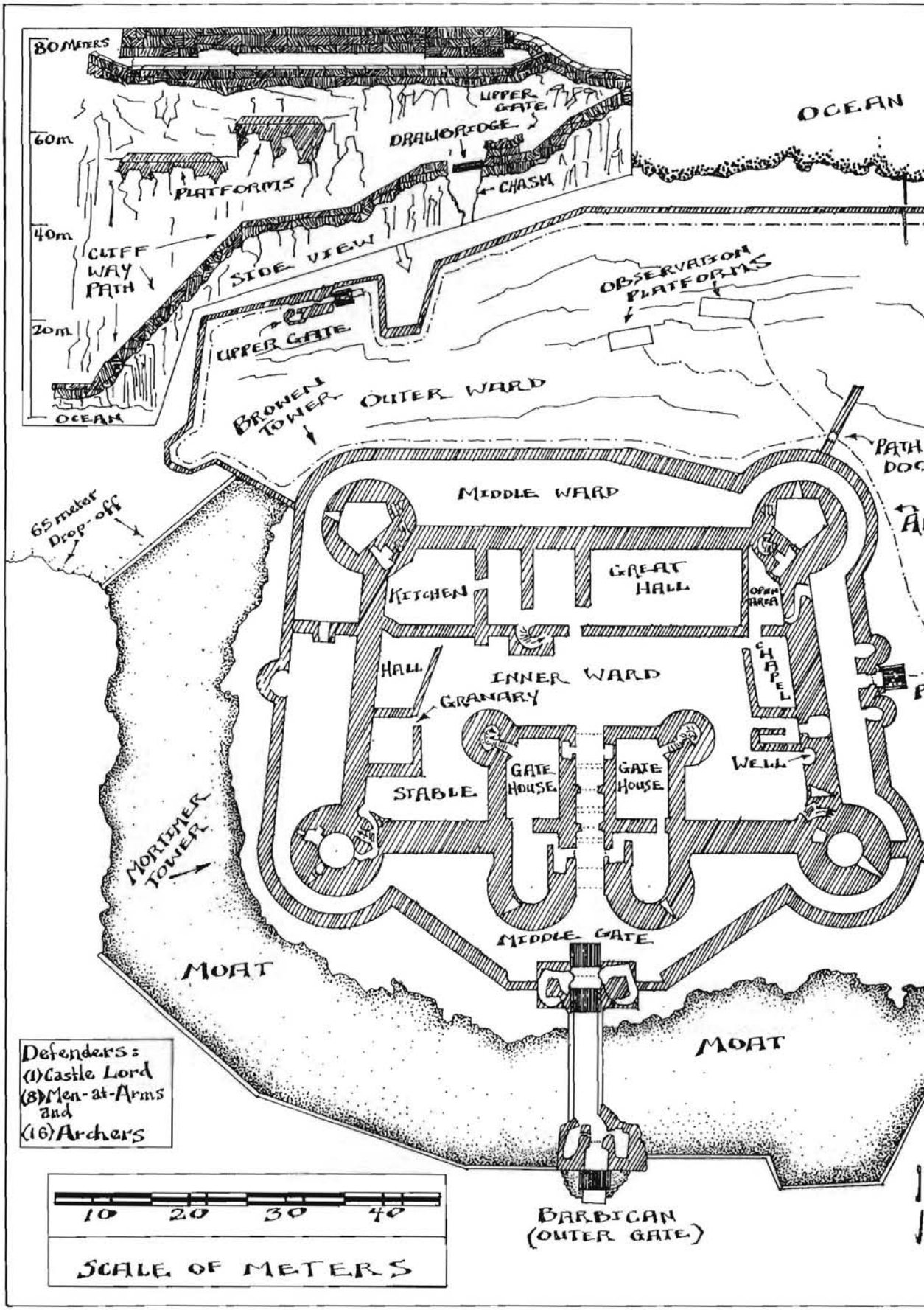
0 5 10 15 20 25
METERS

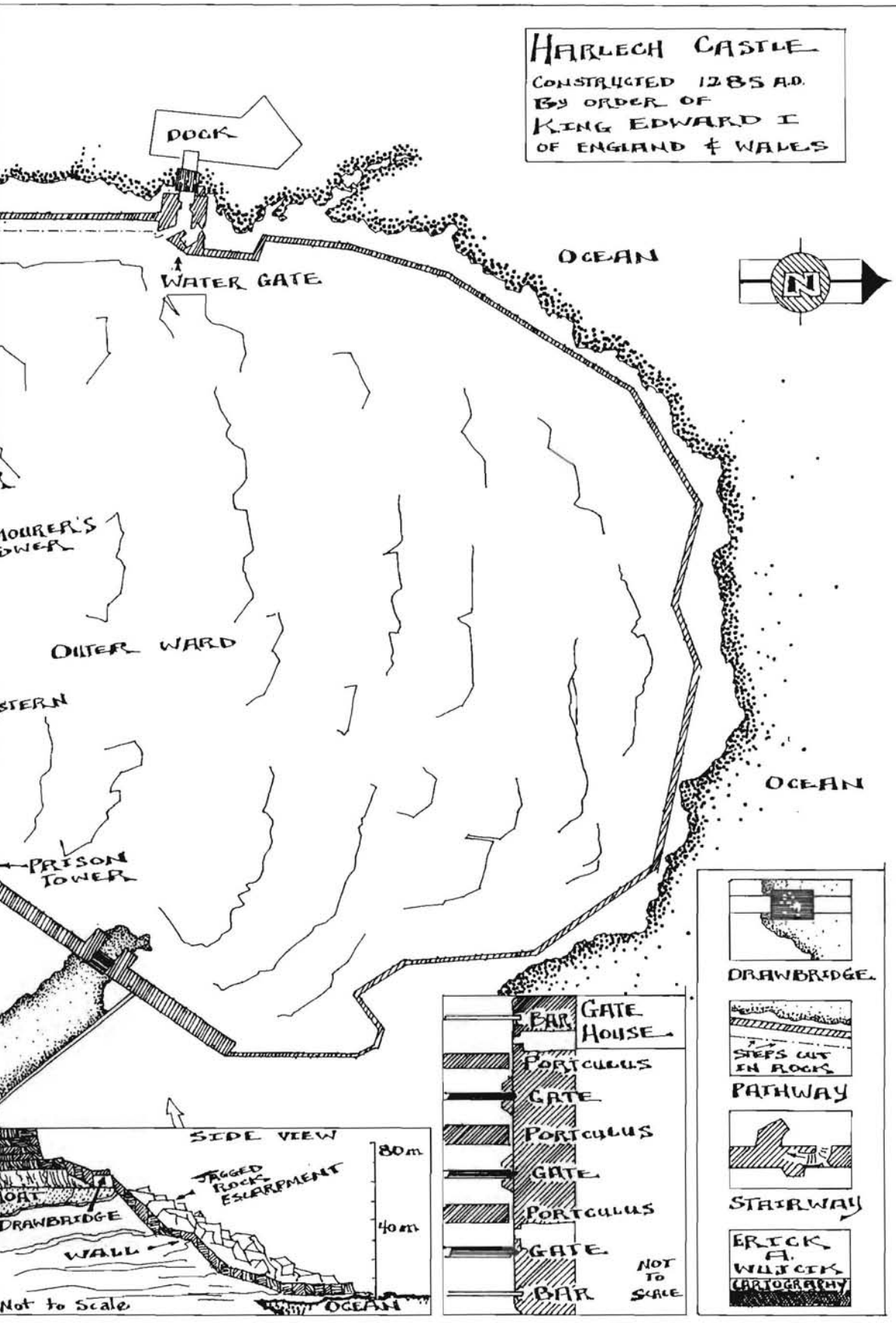

MODELLED AFTER
CHATEAU GAILLARD
Ca 1196
WALL RATINGS
OUTER WALLS/TOWERS 2
KEEP WALLS AND TOWERS 3
OUTER WALLS AND TOWERS
OUTER WARD
WOOD BRIDGE


CLIFFSIDE
KILLING GROUND
POSTERN
KEEP
INNER WARD
INNER GATE
WATERWAY
MIDDLE WARD
MIDDLE GATE
WELL
WATERWAY
OUTER WARD
OUTER GATE
BRIDGE
CHÂTEAU GAILLARD
20 METERS
DRAW BRIDGE

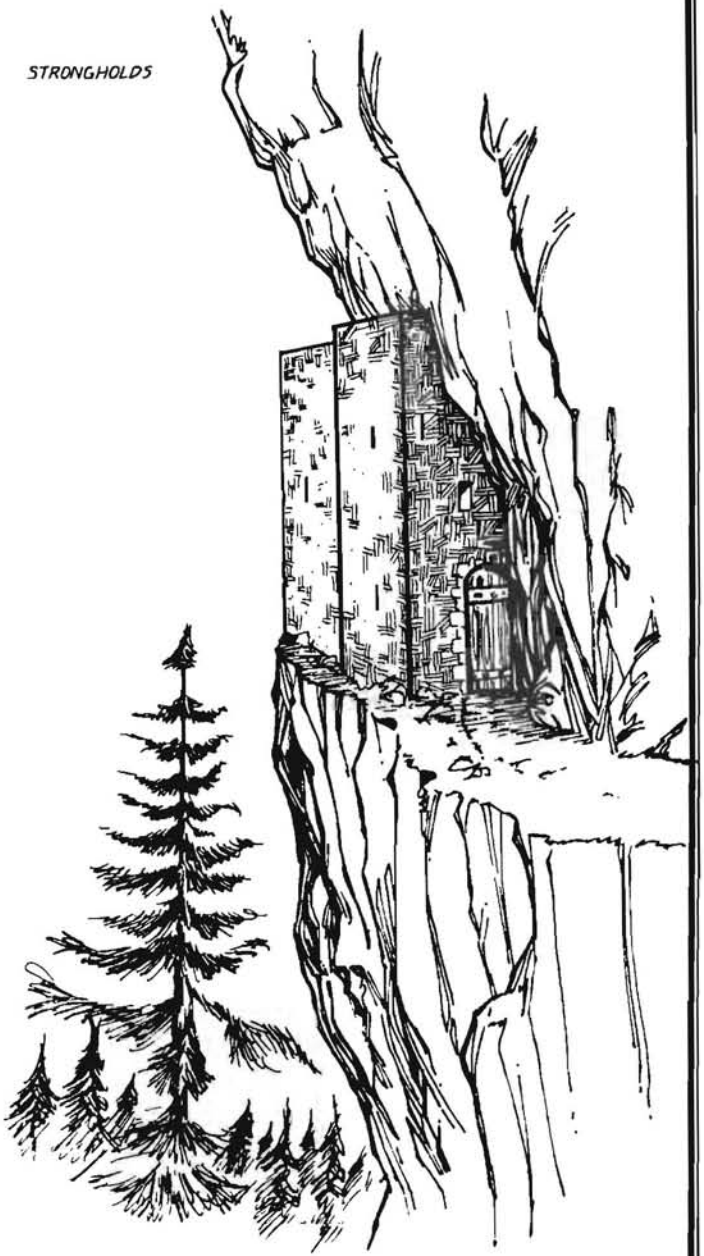

THE KEEP OR DONJON
OF TRIM CASTLE
Ca. 1200
12.2 m. TALL
WALL RATING 2


TRIM
CASTLE
KEEP
ROOFTOP
STAIR COVER
OUTSIDE STAIRWAY FROM GROUND
KILLING PLATFORM
GATE
INSIDE GATE
BREW
MIDDLE FLOORS
SECOND FLOOR
STORAGE
GROUND FLOOR
1 2 3 4 5 6 7 8 9 10
METERS


80 Meters
60m
40m
20m
OCEAN
UPPER GATE
DRAWBRIDGE
PLATFORMS
CHASM
CLIFF WAY PATH
SIDE VIEW
OCEAN
OBSERVATION PLATFORMS
UPPER GATE
BROWEN TOWER
OUTER WARD
MIDDLE WARD
65 meter Drop-off
KITCHEN
GREAT HALL
OPEN AREA
CHAPEL
HALL
INNER WARD
GRANARY
STABLE
GATE HOUSE
GATE HOUSE
WELL
MORTIMER TOWER
MIDDLE GATE
MOAT
MOAT
Defenders:
(1) Castle Lord
(8) Men-at-Arms
and
(16) Archers
10 20 30 40
SCALE OF METERS
BARBICAN
(OUTER GATE)


HARLECH CASTLE
CONSTRUCTED 1285 A.D.
BY ORDER OF
KING EDWARD I
OF ENGLAND & WALES
DOCK
WATER GATE
OCEAN
N
OUTER WARD
PRISON TOWER
OCEAN
SIDE VIEW
80m
40m
JAGGED ROCK ESCARPMENT
DRAWBRIDGE
WALL
Not to Scale
OCEAN
BAR
GATE HOUSE
PORTCULLUS
GATE
PORTCULLUS
GATE
PORTCULLUS
GATE
BAR
NOT TO SCALE
DRAWBRIDGE
STEPS CUT IN ROCK
PATHWAY
STAIRWAY
ERICK A. WUJCIK CARTOGRAPHY

MODELLED AFTER
HARLECH CASTLE



STRONGHOLDS WERE SIMPLE STRUCTURES BUILT OF MASONRY ACROSS THE MOUTH OF A CAVE OR ON THE OVERHANGING NARROW LEDGE OF A CLIFF FACE, AS PICTURED ABOVE.

THESE SIMPLE WALLED STRUCTURES WOULD UTILIZE AS MUCH OF THE MOUNTAIN'S NATURAL PROTECTION AS POSSIBLE. WITH ONLY ONE OR TWO MAN-MADE WALLS.

SITUATED WHERE THEY WOULD NOT BE SUBJECT TO ATTACK FROM SEIGE MACHINES, THE WALLS WERE NOT AS STRONG OR THICK AS TYPICAL CASTLES.

STRONGHOLD OUTPOSTS WERE USUALLY OCCUPIED BY 10 TO 20 MEN.

WALL RATING 1

HARLECH CASTLE - WALES

HISTORY:

1283 - Construction begins at the command of King Edward I. Harlech is designed to be one of a number of castles built to hold conquered Wales. Harlech is built on a naturally defensible site with a sea port. The view enables the castle inhabitants a survey of costline up to twenty miles away.

1404 - Harlech is surrendered after a lenghty siege to the Welsh Hero Owen Glendower. The final defenders consisted of 21 sick and starving men. Had needed supplies arrived, the castle might have stood indefinitely.

1409 - Eight months of siege are required before the Welsh surrender to the English Army. Supplies intended for the Water Gate were blockaded by two English ships.

1460 - Queen Margaret of the Lancastrians takes refuge in Harlech on the death of her husband, Henry VI.

1468 - After a siege of seven years, Harlech is the last stronghold to surrender. At the end of the siege, only 50 able men remain, including the future King of England, twelve-year-old Henry the VII.

1647 - In the English Civil War, Harlech is the last Royalist castle to surrender to the Parliamentary Armies.

DEFENSIVE FEATURES:

THE WATER GATE

In order to approach Harlech Castle from the ocean, one first had to take the Water Gate (which was equipped with both a gate and a drawbridge). Then there is a long climb on steps cut into the cliff-side, all in range of the western towers of the castle. The Upper Gate was also fitted with gate and drawbridge (this time over a great chasm). Yet another steep climb in arrow range followed. Passage then curved around until ending in the wall that juts out from the northwest corner of the castle. The doorway must be passed and then the trip continues to the actual Postern, with a drawbridge and gate as defense. No serious attempt at attacking Harlech this way was ever made.

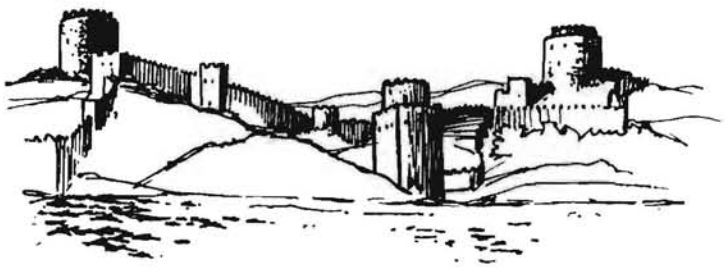
THE MAIN GATE

After defeating the two outer gates and getting over the three drawbridges, an enemy was faced with attacking the Gate House proper. The only passage through this building is blocked by two bars, three gates and three portcullises. All three stories of the Gate House are open to the Main Gate and fire can be concentrated from the above three floors.

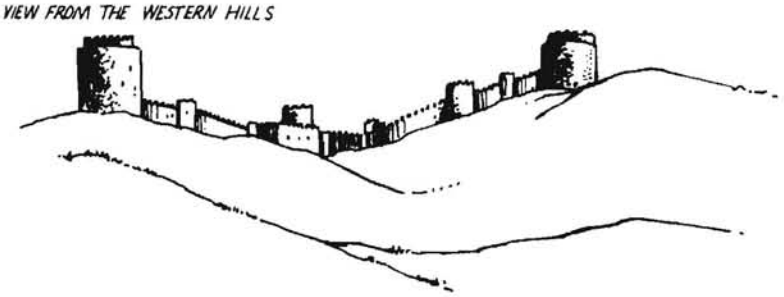
THE NORTH WARD

Jagged rock and clear bow fire would greet any foe attempting the North Wall of the castle. The only possible path was along the wall coming out from the northeast corner. This wall was equipped with a drawbridge to prevent attacks from that direction.

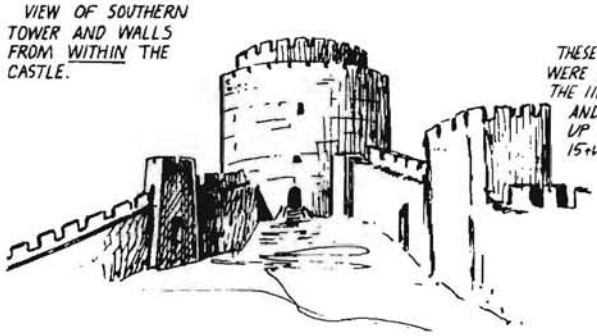
ROUMELI HISSAR
WATERFRONT VIEW



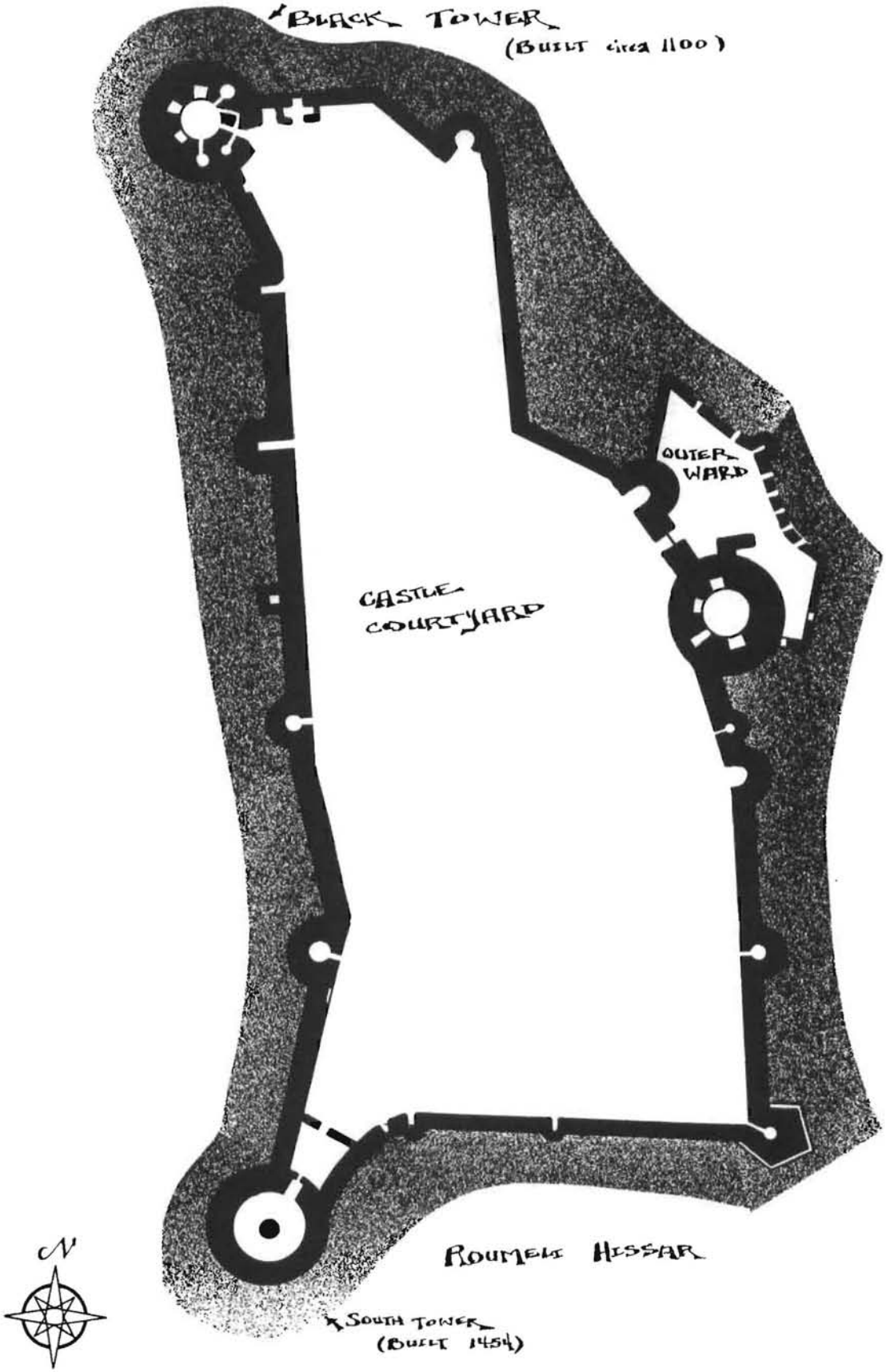
VIEW FROM THE WESTERN HILLS

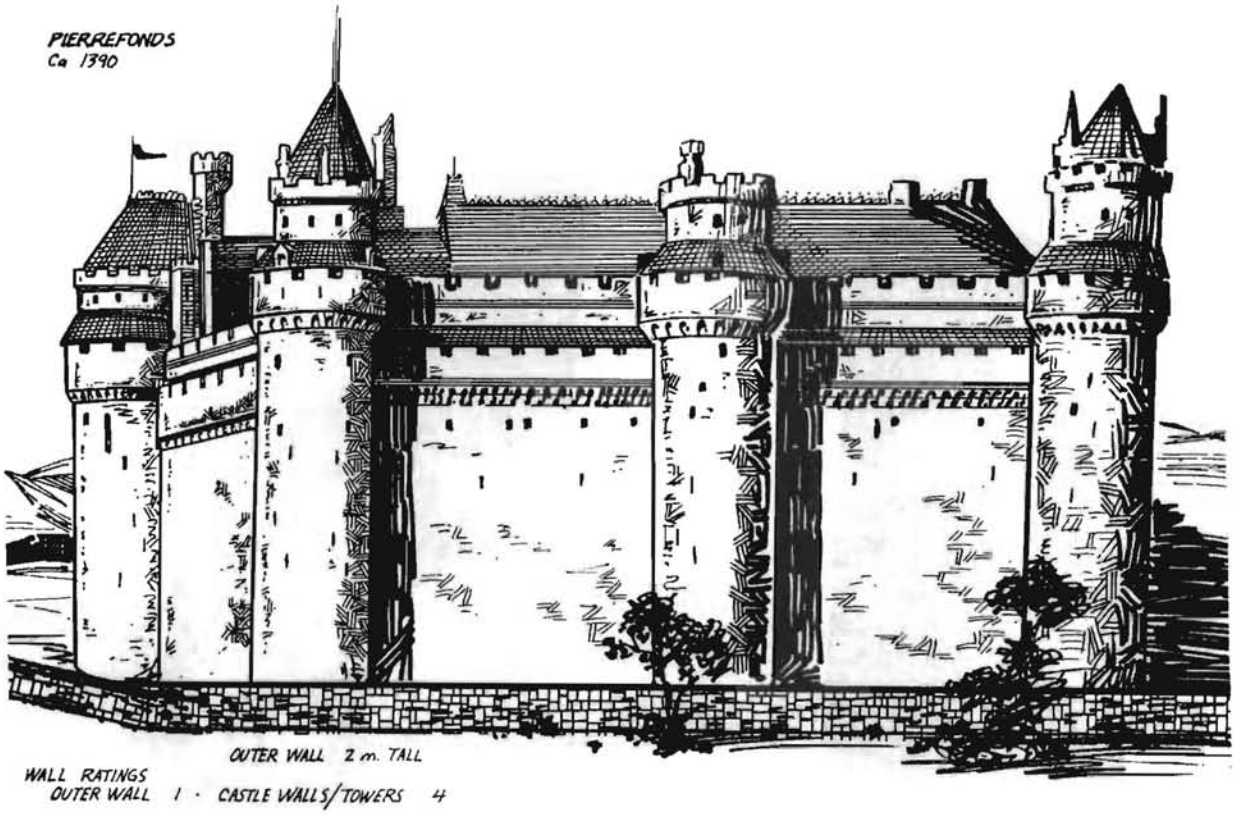


VIEW OF SOUTHERN TOWER AND WALLS FROM WITHIN THE CASTLE.



THESE MASSIVE FORTIFICATIONS WERE ORIGINALLY BUILT IN THE 1100's WITH MODIFICATION AND ADDITIONS INCORPARATED UP TO ABOUT THE LATE 15th CENTURY.


BLACK TOWER
(BUILT circa 1100)
OUTER WARD
CASTLE COURTYARD
ROUMELI HISSAR
SOUTH TOWER
(BUILT 1454)
N



CASTLES AND FORTIFICATIONS IN GAMING APPLICATIONS

Fortifications in war serve as equalizers, a force that stands behind wall, water or ditch will often be the equal of the larger enemy beseiging. This fortification need not be an imposing castle to be effective. Romans and Mongols, Moslems and Knights all had their own methods of taking advantage of the strength of a prepared position.

The Strategic View

An expensive endeavor such as castle building on the scale of that in Norman England primarily was for holding hostile territory. In many cases the castles were designed to be held by a minimum number of troops. This allowed for the deployment of needed forces far from areas that might be troubled by rebellion or invasion. Full scale invasions went beyond the ability of the castle to function but the use of castles in either delaying or even splitting the invasion force cannot be underestimated. Castles were also valuable as storehouses in the event of trouble in the area. A lord could be aasured of at least a minimum of supplies in any trouble spot.

Massive strategic defenses were also possible. A great wall (as in China or England's Roman Walls) or a series of border fortifications can be good deterents against invasion. It should be noted that any type of purely defensive fortification will be very expensive to maintain. Constant resupply and the large number of troops required to man the defenses can be very draining on the purses of the government. In the long run most rulers find that mobile armies are far cheaper, and they can be dispatched to areas of unexpected trouble.

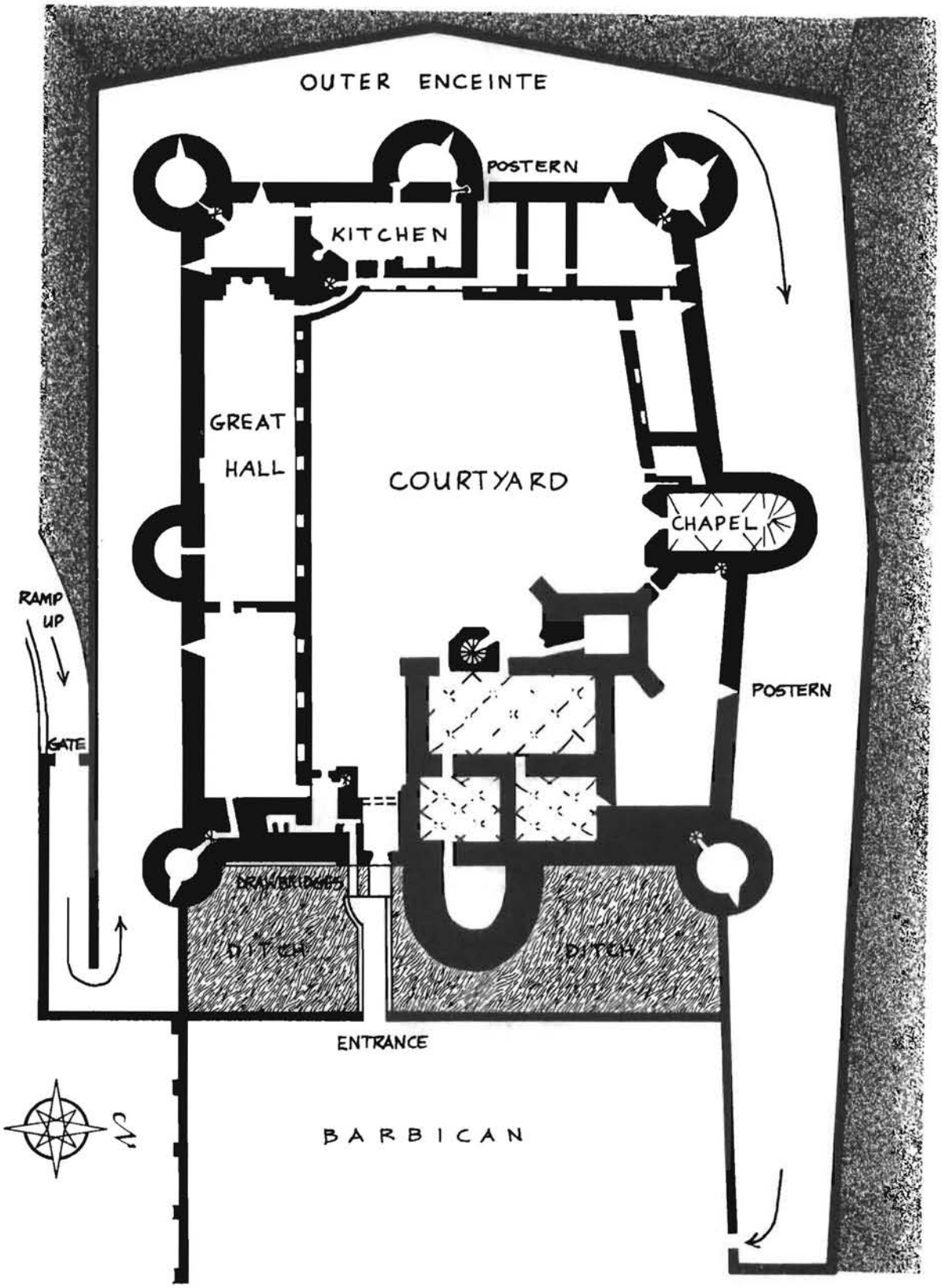
Tactical and Role-Playing Considerations

There are a variety of measures that can be taken to strengthen either the offense or defense operation. Even armies as strongly oriented toward quick, mobile attacks as the Mongols found that field entrenchments were useful in strenghtening their center line. This actions would allow more forces to be diverted into their devastating flanking maneuvers.

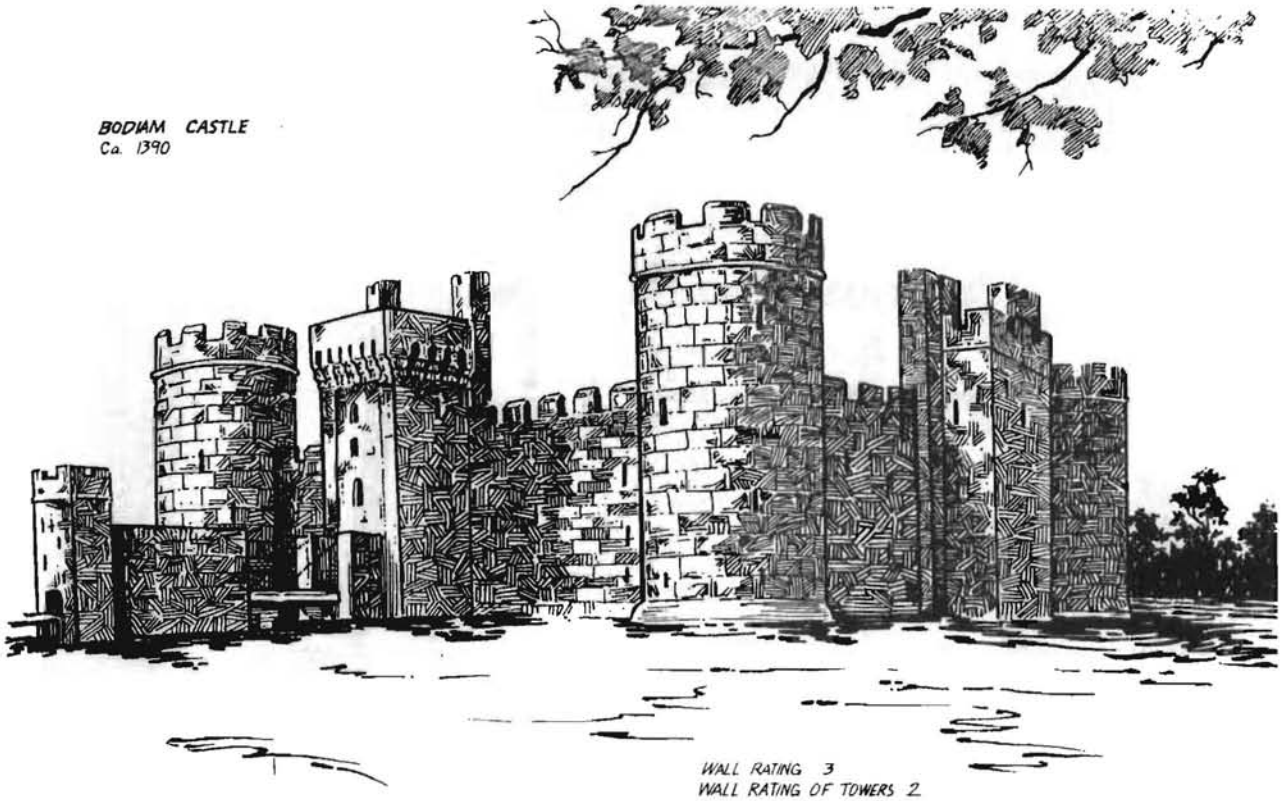
GEOGRAPHY AND TERRAIN. Pay close attention to the geographical features of any battleground or campsite. Ridges, waterways, and heavy plant growth can all be useful in blunting the attack of an enemy or restricting infiltrators. Carefully evaluate terrain in terms of your own forces as well as the enemy. Roman armies faced with superior cavalry forces always stay on rough ground in order to slow up any attack. Also be certain of the defensive qualities of the area you may be forced to retreat into... as well as the area where you might need to pursue your foe.

ENTRENCHMENT. From Roman times to contemporary the main tool of the infantry has always been the shovel. A simple ditch is a powerful 'equalizer' when the primary method of combat is hand-to-hand. Without exception, every Roman Army in the field constructed field fortifications whenever they camped. This meant that two to four hours would be spent by at least half the force.

PALISADES AND WALLS. Although barbed wire might not be available every historical period had some form of field-portable defensive structure. William the Conqueror actually brought along a disassembled fort to England. Every Roman soldier carried two stakes for palisades. These would be 2 meters long and sharpened on both ends. Without sharpened, set stakes and the cover of the woods the archers at Agincourt (1415) would have been helpless against the vastly larger numbers of mounted knights.

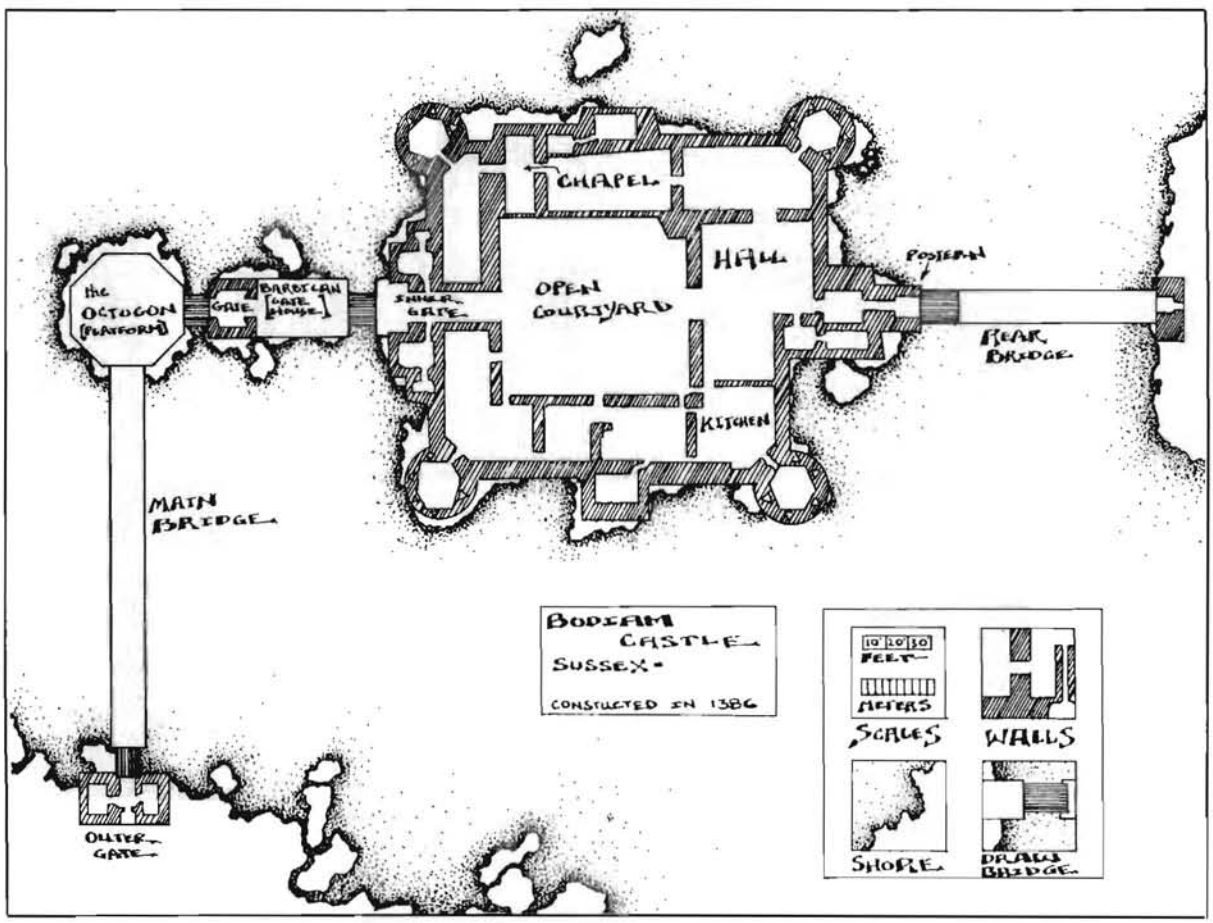

OUTER ENCEINTE
POSTERN
KITCHEN
GREAT HALL
COURTYARD
CHAPEL
RAMP UP
GATE
POSTERN
DRAWBRIDGES
DITCH
DITCH
ENTRANCE
BARBICAN

BODIAM CASTLE
Ca. 1390



WALL RATING 3
WALL RATING OF TOWERS 2

WALLS STOOD ABOUT 9m TALL
TOWERS ABOUT 17m TALL



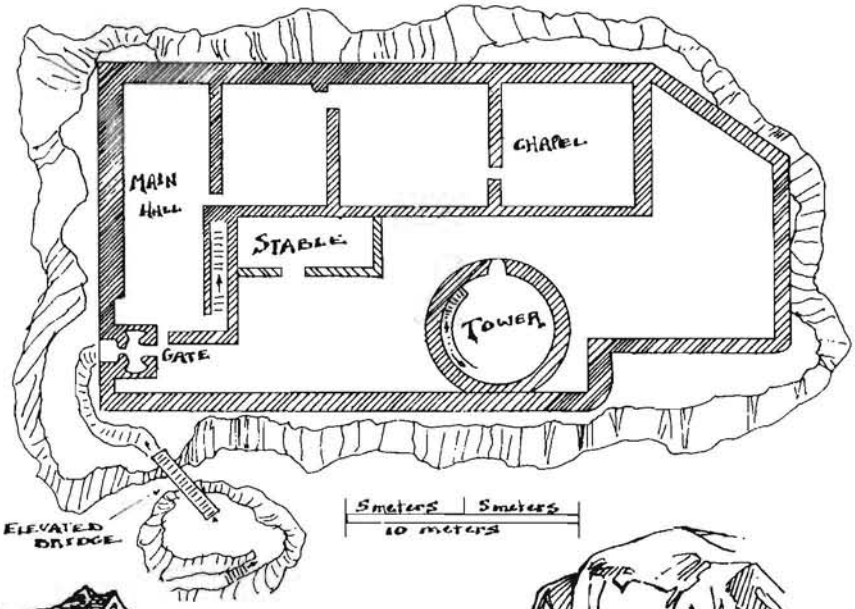
KARLSTEIN bei REICHENHALL

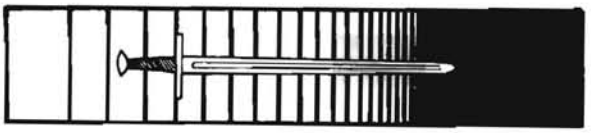
Ca 1100

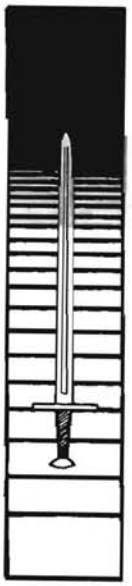
THE NATURAL MOUNTAIN TERRAIN MADE THE USE OF SIEGE MACHINES IMPOSSIBLE AGAINST THIS CASTLE.

CONSEQUENTLY. THE WALLS AND TOWER DID NOT HAVE TO BE AS HEAVILY FORTIFIED AS THE AVERAGE CASTLE.

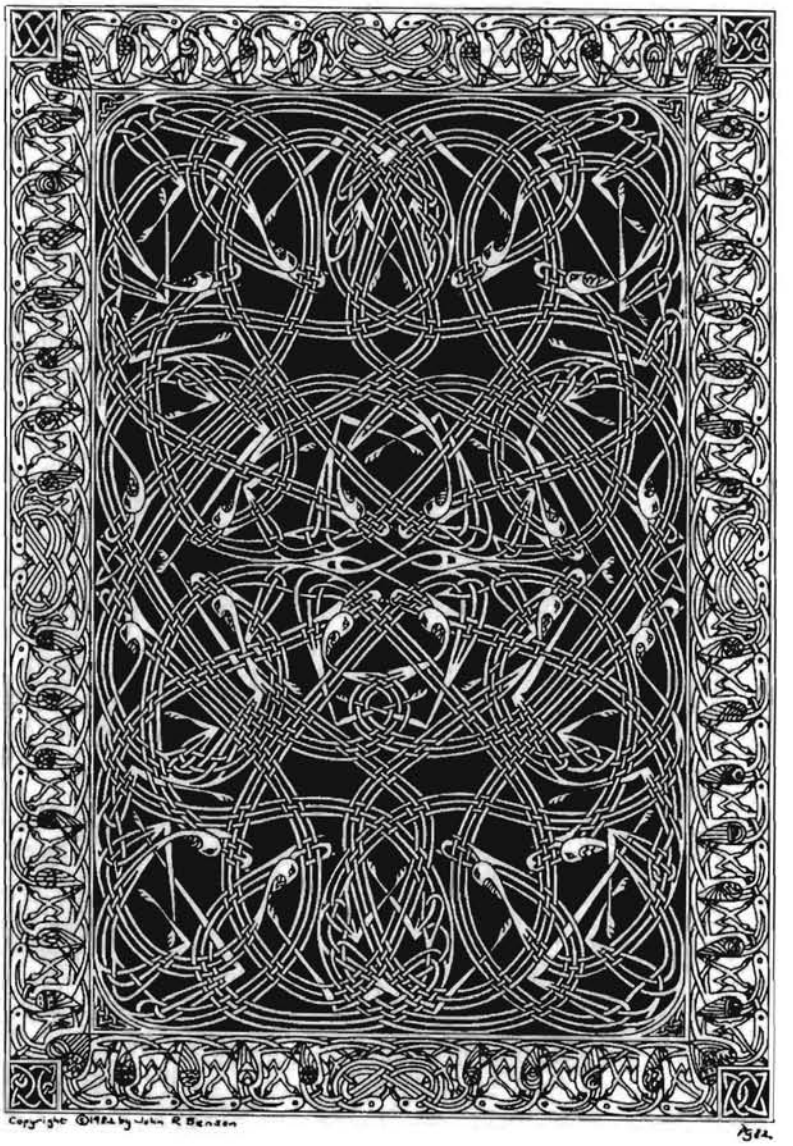
WALL RATING 1

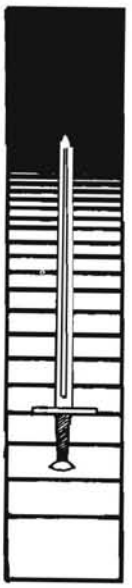


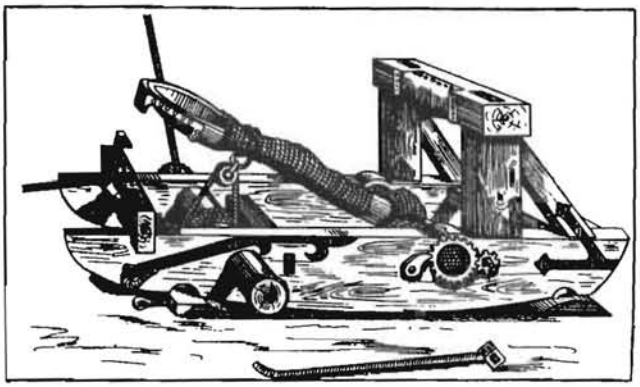




SIEGES







Laying Siege

Laying siege to a castle or fortified town was the most complex and dangerous job a Medieval army could undertake. Maintaining a suitable army in one place for a long time required tremendous efforts just in keeping it supplied. In addition, areas with large concentrations of people were subject to epidemics from a number of sources. Last but not least, was the danger of the besiegers being cut off by a relieving army.

Depending on the preparedness of the attacking army and the amount of suprise achieved, the besiegers might attempt to outright storm the castle's walls as soon as they arrive on the scene. Scaling ladders were used in an attempt to gain access to the walls of the castles while the defenders attempted to push the ladders away. If this type of attack was repulsed, the attacking forces would usually step back and begin the more complex and grim waiting game which a siege entails.

The earlier castles usually had only one entrance and, as a result, the besiegers could concentrate all of their forces at this point to prevent escape. With the development of castles with numerous exits, the attackers had to spread out and encircle the entire structure. An armed camp was set up by the attackers which usually consisted of a ditch and a wooden palisade. The palisade was further strengthened by piling the dirt from the ditch against it. In areas which were subject to cavalry attack, sharpened wooden stakes were placed in the ground to strengthen the defence.

During this time of waiting the attackers would be busy themselves with the construction of siege weapons, siege towers, battering rams, and mantlets. If the area was suitable, mining operations would soon begin and proceed towards the walls.

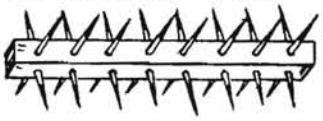
Often before the main attacks began, the attackers would offer terms to the defenders. These would range from unconditional surrender to a relatively small tribute, depending on the anamosity between the two sides. These talks often continued after the attacks had begun. Talks with spys and dissatisfied members of the defence would also occur in an attempt to gain an advantage or secure a guarantee of betrayal.

By blockading the castle while conducting all of these activities the attackers were hoping that the defenders' food or water would run out or that some sort of disease would break out amoungst them. Water supplies were often poisoned in an attempt to weaken the defense as well.

Bombardment by siege engines was carried out to harras the defenders as well as weaken the walls. Defenders used siege engines, too, in attempts to destroy the enemy's weapons and to weaken attacks. If the castle was surrounded by a moat or ditch, minor attacks were made and bundles of wood were thrown in to fill them up. This allowed access to the walls for the attacker's towers and rams. If the moat was filled up, the defenders usually attempted to sally forth and clear away the debris.

If the defenders suspected that a tunnel was being dug they would employ a number of tricks to find it. People with exceptional hearing would be instructed to listen, especially around foundations, for sounds of tunneling. Pans of water would be set out as well in an attempt to detect vibrations. When the tunnel was detected a counter mine was started to intercept it. When the tunnel was broken into by the defenders, a fierce battle would usually develope as the attackers had much time invested in the work and the defenders would be giving up a free passage into the defences if they lost. If the attackers were successful in tunneling under the foundation of a wall, pitch and other imflammable materials would be packed into the mine and then set on fire. When the flames ate through the support beams of the chamber and weakened the foundation of the wall, the structure would collapse and create a breach.

Once a breach was made in a wall; either by mining, bombardment, or battering; a general assult would be called in an attempt to secure a foothold in the castle. If the defenders were strong enough to repulse the attack, they would concentrate on filling in the breach. This was done by rubble, debris, and beams with long sharpened spikes drove into them called cheval-de-frise. Often the breach could be made just as defensable as the original wall was.



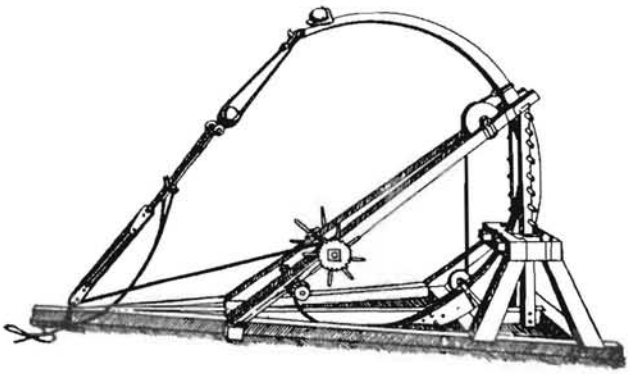
As you can see, a successful siege was a very complicated affair which required alot of time and expense. Coordinated efforts utilizing bombardment, mining, and close assults were usually effective. The least costly, in terms of lives, was to wait until the defender's food gave out but that could take months. All in all, sieges were not to be taken lightly.

Equipment and devices which were used in siege warfare include siege towers, battering rams, the mouse, mantlets, Greek fire, grappling hooks, quicklime, ladders, boiling water, and hot sand to name a few.

Siege towers were large structures built of wood which not only allowed the attackers access to the walls but also gave them higher positions than the defenders from which to fire missiles. The towers were constructed on the site of the siege and then rolled up to the wall over which the attackers could move. The entire structure was covered with fresh animal hides to protect it from fire and the people inside it from arrows. Often if the defenders knew where the tower was to be placed, they would build wooden towers of their own on that spot on the wall.

In its simplest form, a battering ram consists of a stout log attached to a frame so that it can be swung back and forth. To protect the workers of the ram, however, the structure was usually covered by a roof or fresh hides. A large metal head, often in the shape of a ram, facilitated the breaking down of doors. Sometimes rams were built into siege towers.

The mouse was the name for a weapon similar to the ram except that the head of the machine was pointed and it was used to pick and bore away at the masonry of a solid wall. Corners of square towers were especially vulnerable if the attackers provided good covering fire in support of the operation. As with the ram,



this weapon could be housed in its own structure or incorporated with a siege tower.

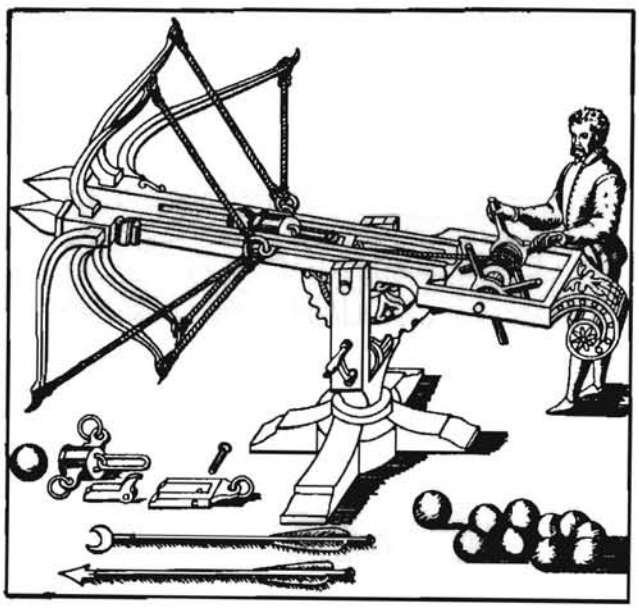
Mantlets were basically large wooden shields mounted on wheels to provide cover for archers, engineers, or other attackers.

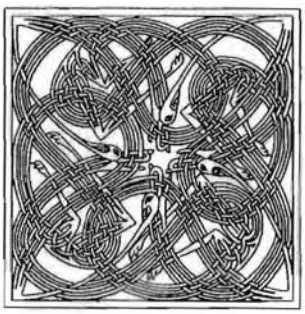
If the defenders had enough forewarning of an impending attack they would often build hoardings on the walls and towers of their castles. These structures, built of wood, extended out over the ramparts. From these the defenders could either fire arrows or drop stones and other things onto attackers at the base of the walls. Often the base of the walls were slightly bulged out so that stones would bounce off them and then along the ground. This enabled the rocks to be directed against covered weapons; i.e. rams, towers, etc.

In its simplest form, a drawbridge consists of a number of planks over a ditch or moat which can be drawn back when someone is inside. A less tedious method of use, however, would result if you made the bridge so that it could be lowered and raised at will, without having to drag all those planks around. One type of this form consisted of two long beams connected together like a rectangle. This frame was hung over the gate with one end attached to the bridge by chains and the other, which hung inside the castle, being counterweighted. With this arrangement you could raise the bridge by lowering the ends with the counterweight. A more elaborate system had the portcullis and the drawbridge attached to the same chain so that they would act as counterweights for each other. When the drawbridge was down the portcullis, which is basically a heavy iron lattice used to block passages, would be up.

One technique used by defenders when confronted by rams or towers was to grapple the machine in an attempt to disrupt its actions or destroy it. Grappling the actual ram of a battering ram would divert it from its path and cause it to be much harder to use. If a large enough winch was available the defense could even tip the attacker's machines over. Naturally, the attackers would try their utmost to cut any lines which were successfully attached to their weapons.

Any number of objects were dropped from the walls during the defense of a castle. Some of the more interesting ones included hot sand, boiling water, and Greek fire. Sand and water was especially good in penetrating the chinks in armour. Oil and molten lead were never used due to their expense. Greek fire was originally developed in ancient times and was used throughout Europe and the Middle East. Using petroleum as a base, this liquid could be put in containers and thrown like molatov cocktails. Some cultures built machines to squirt this fire like modern flamethrowers.





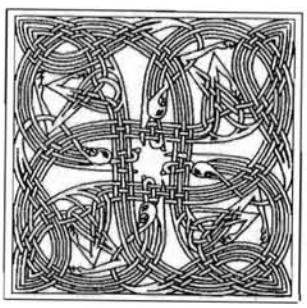
CASTLE GARRISONS

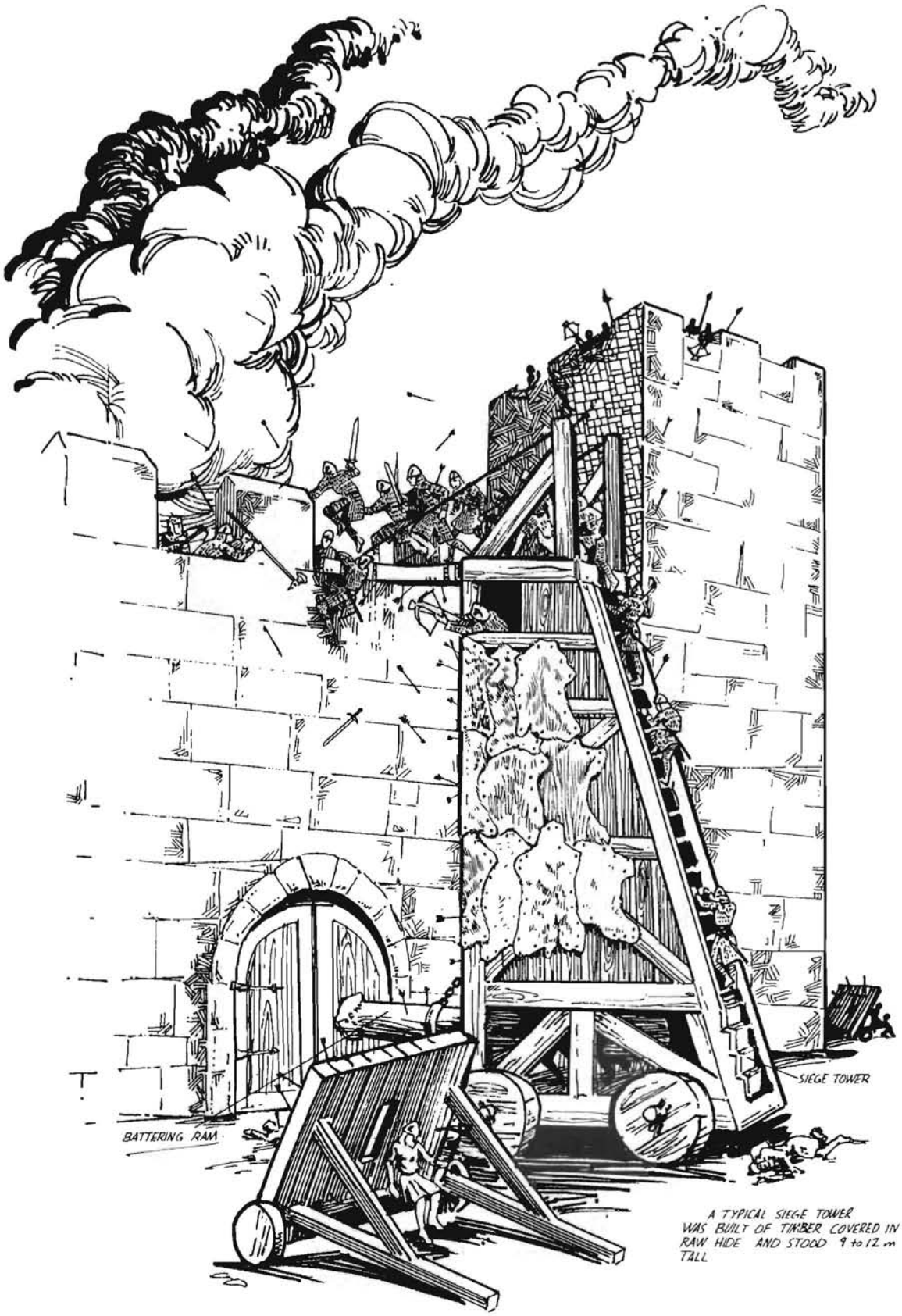
The number of men garrisoned in a given castle at any given time varied greatly. Not only did peace or war affect the numbers in a castle but the status (and pocketbook) of the commander and the faithful performance of military obligations by vassals did as well. For an average royal castle in Britan around 1300, the permanent garrison was as follows: the constable, fifteen crossbowmen, a smith, a carpenter, a mechanic, and twenty-five men at arms. In addition, there was usually some sort of domestic staff; servants, janitors, etc. In times of war, this garrison could be greatly augmented, depending on the size and preparedness of the castle of course. Even in war, however, only the largest of castles would hold no more than 100-150 men at any time.

The following names were commonly, and often indiscriminately applied to the ancient and medieval engines that projected stones and arrows of large size:

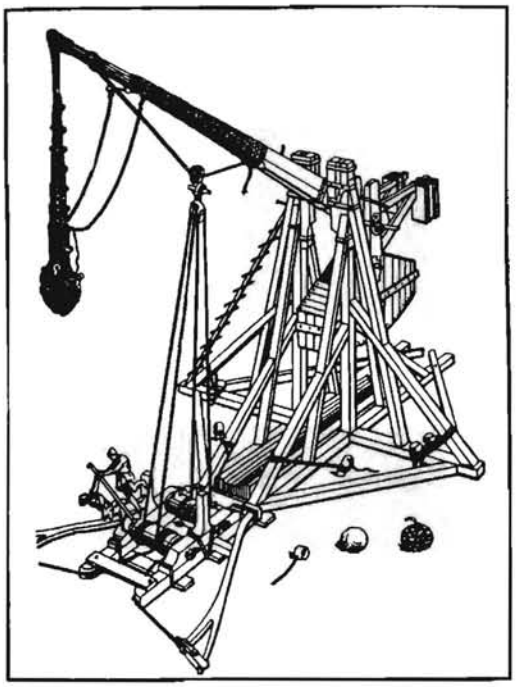
Balista	Engin	Martinet	Scorpion
Beugle	Engin à verge	Matafunda	Springald
Blida	Espringale	Mategrifon	Tormentum
Bricole	Fronda	Petrary	Trebuchet
Calabra	Fundibulum	Robinet	Tripantum
Catapulta	Manganum		

Though so many names suggest that there were numerous varieties of siege engines, this was not the case.





A TYPICAL SIEGE TOWER WAS BUILT OF TIMBER COVERED IN RAW HIDE AND STOOD 9 to 12 m TALL



Siege Weapons

The basic concepts and designs behind siege weapons remained essentially the same from their first use in ancient times through the Middle Ages. Torsion was the most basic type of force used in these weapons. The only type of siege weapon not used in ancient times was the Trebuchet, which came into being during the twelfth century.

The five basic types of siege artillery are the catapult, onager, balista, springal, and the trebuchet. The catapult consists of a frame and a heavy cross beam mounted and braced perpendicular to it. Directly behind the cross beam is a large system of cords, called a skein, which holds the arm of the machine. These cords consisted of neck sinews of animals or sometimes human hair. Where the skein was attached to the frame a series of gears or ratchets were located which allowed the skein to be tightened. The skein was tightened such that the arm of the catapult rested against the cross-beam. In larger catapults, the force required to bend back the arm into a cocked position was considerable and often took many men operating a winch-like apparatus. The release was usually a metal bar, with a lanyard attached, which went into a metal ring mounted on the arm. An average size catapult, with a frame of 3.5 by 1.5 meters could cast a four kilogram stone about 325 meters. Rate of fire is about one stone per 5 minutes. Larger ones, about twice the size, could cast a 20-30 kilogram stone 325-375 meters.

The onager is very similar to the catapult except that a sling-like structure was used to hold the stones. The properties of the sling enabled missiles to be hurled farther than catapults of similar tensions. These engines could not hurl flaming projectiles however. The onager as pictured could hurl a four kilogram stone about 375-400 meters. Rate of fire is about one stone per 5 minutes.

The balista shot heavy arrows and, with proper modifications, stones as well. The balista resembled crossbows to some extent although the arms were not connected. Each arm had a skein of twisted cords, similar to those of a catapult, attached to it. It is theorized that the balista inspired the invention of the crossbow or arbalest. The arrows which were shot from a typical balista were about 4 kilograms in mass, and 1.2-1.7 meters in length. The range of these weapons was about 360-400 meters. As opposed to the other siege weapons the balista was more of a direct fire weapon owing to the flat trajectory of the javelin. These weapons were much lighter than catapults and could therefore be transported by an army easier. A balista used for throwing stones had a maximum range of 275-300 meters. These weapons also had a rate of fire of one shot per 5 minutes.

All of the siege weapons which relied on twisted cords to provide power had one major drawback: dampness. Rain or very humid conditions would cause the skeins to slacken and render the machines useless.

The proper maintenance of these weapons was also important if one wanted predictable results. Tightening the skeins, particularly those of the balista, was a delicate job requiring skills similar to those of a piano tuner. Correcting and aiming shots was also a job which required much skill and experience.

The spring engine, or springal, was another form of javelin projecting weapon. This machine basically was a frame upon which the missiles were placed and a wooden arm, or springer, which was drawn back and released. The spring then struck the butt end of the javelin and shot it forth. Contemporary drawings of these weapons are very crude and provide little help in determing the exact nature of the machine. The spring was made of several layers of wood which were glued together similar to a composite bow.

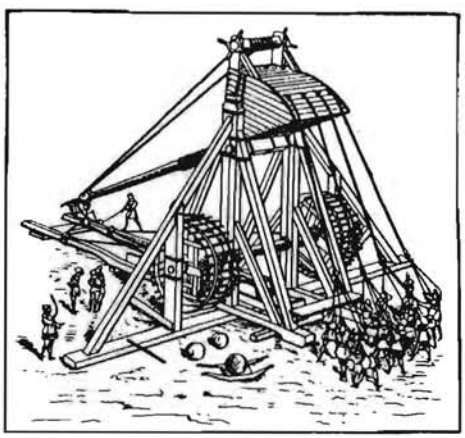
A machine of this type with a spring 4 meters long could project a 2 kilogram, 1.4 meter javelin about 250-300 meters. These weapons could be modified to shoot more than one missile at once and could be used with flaming missiles. This weapon would require 4 men to operate if, and could shoot once per 5 minutes.

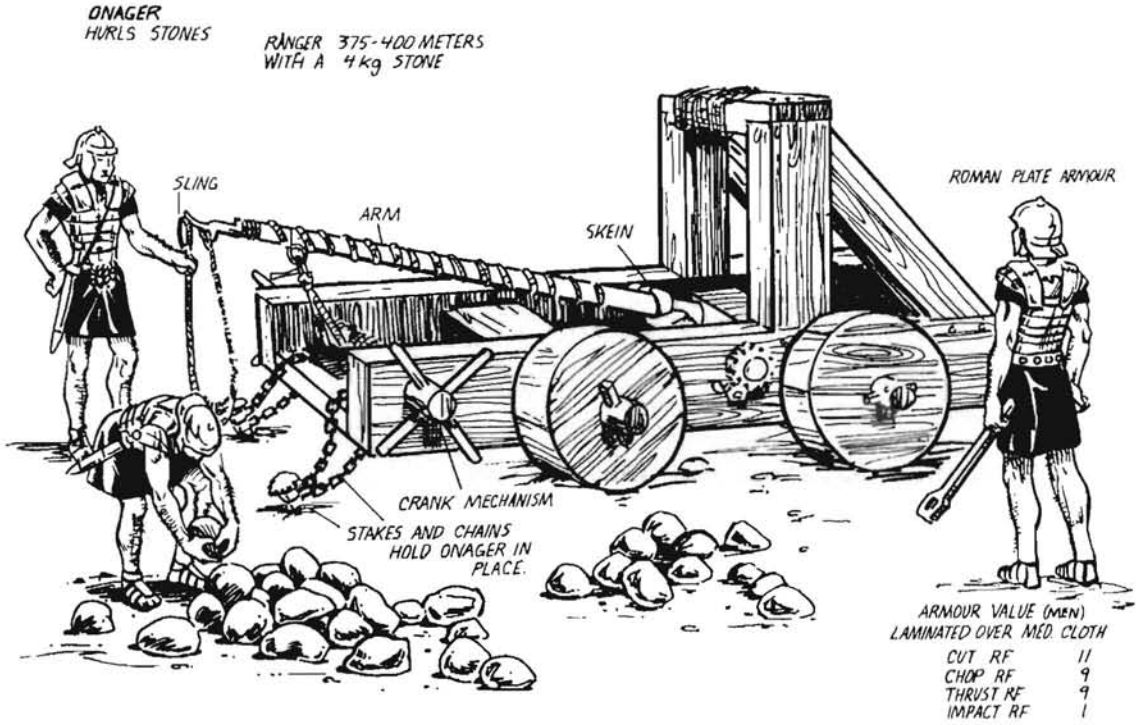
The trebuchet differed from other siege weapons in that it did not rely on torsion to provide the force required to throw projectiles. Instead the arm is attached to a counter weight similar to a child's see-saw. When the weight rotates downward due to gravity, the opposite end of the arm moves upward. The missile is held in a sling similar to that of the onager.

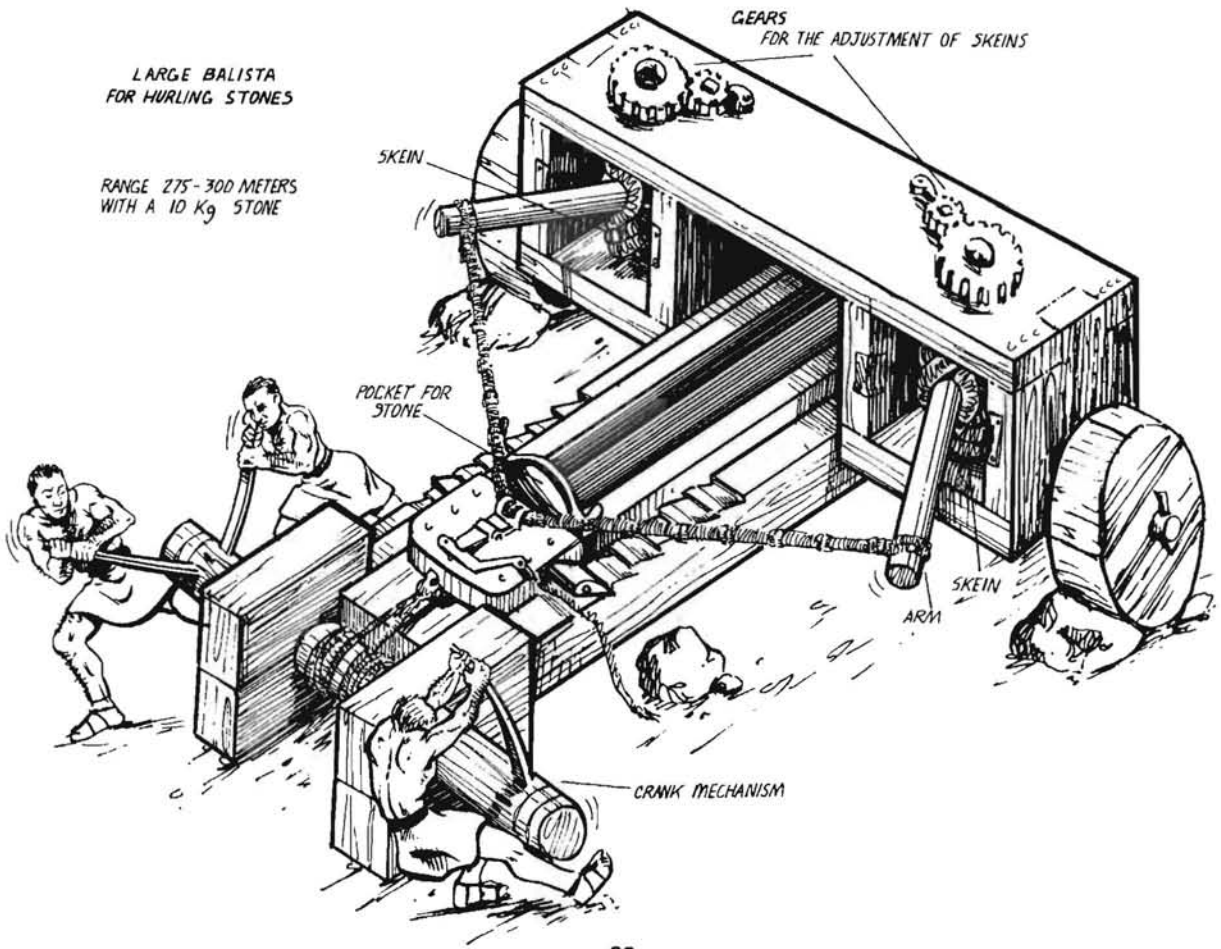
From the middle of the thirteenth century onward, the trebuchet was the favored weapon for use in sieges mainly due to the massive stones, 250 kg and up, they could throw. The constant bombardment from the smaller stones of a catapult would eventually wreck a wall but one huge stone from a trebuchet would shake even the heaviest stonework. These machines were not portable, however, and had to be constructed on their intended sites of use.

The largest machines, those with arms of about 15 meters in length and counterweights of 10,000 kilograms could throw a 250 kilogram stone 275-300 meters. These weapons required upwards of a dozen men to operate them and had a rate of fire of one shot per 15 minutes.

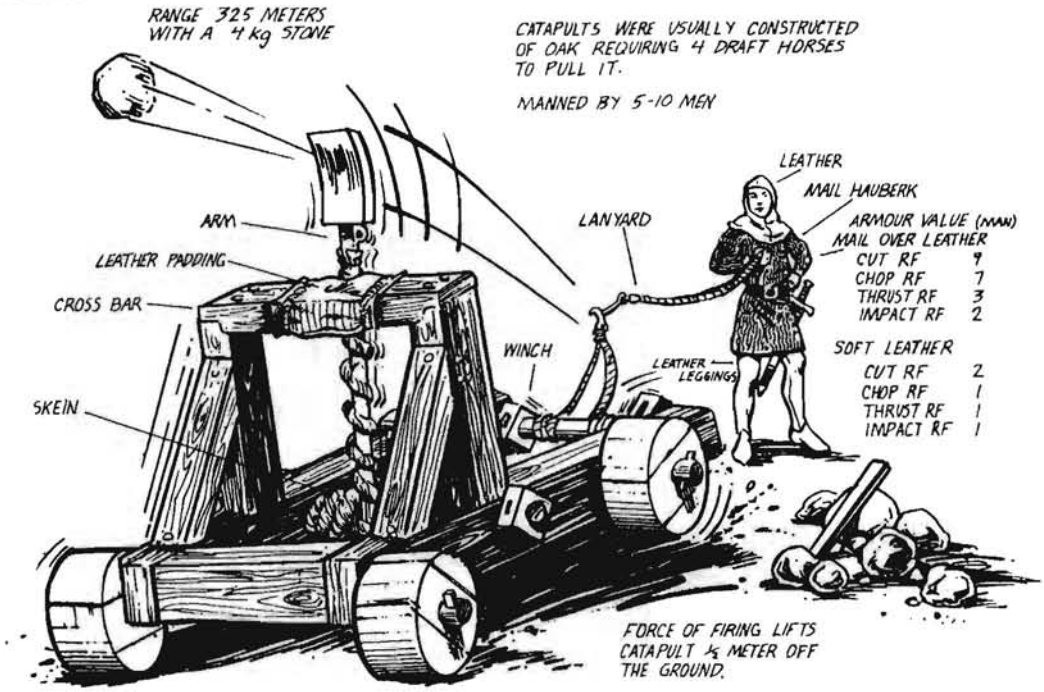
When using any of the above siege weapons in a fantasy game, the destructiveness of the missiles must be kept in mind. Any character hit by one of these missiles should be outright killed. There are contemporary accounts of javelins from balistas pinning men in full armour to trees or even killing three or four with one shot. Although the balista is the only direct fire siege weapon and being struck by a stone from a catapult or trebuchet would only be an unhappy chance occurence, if it does occur the character should die.



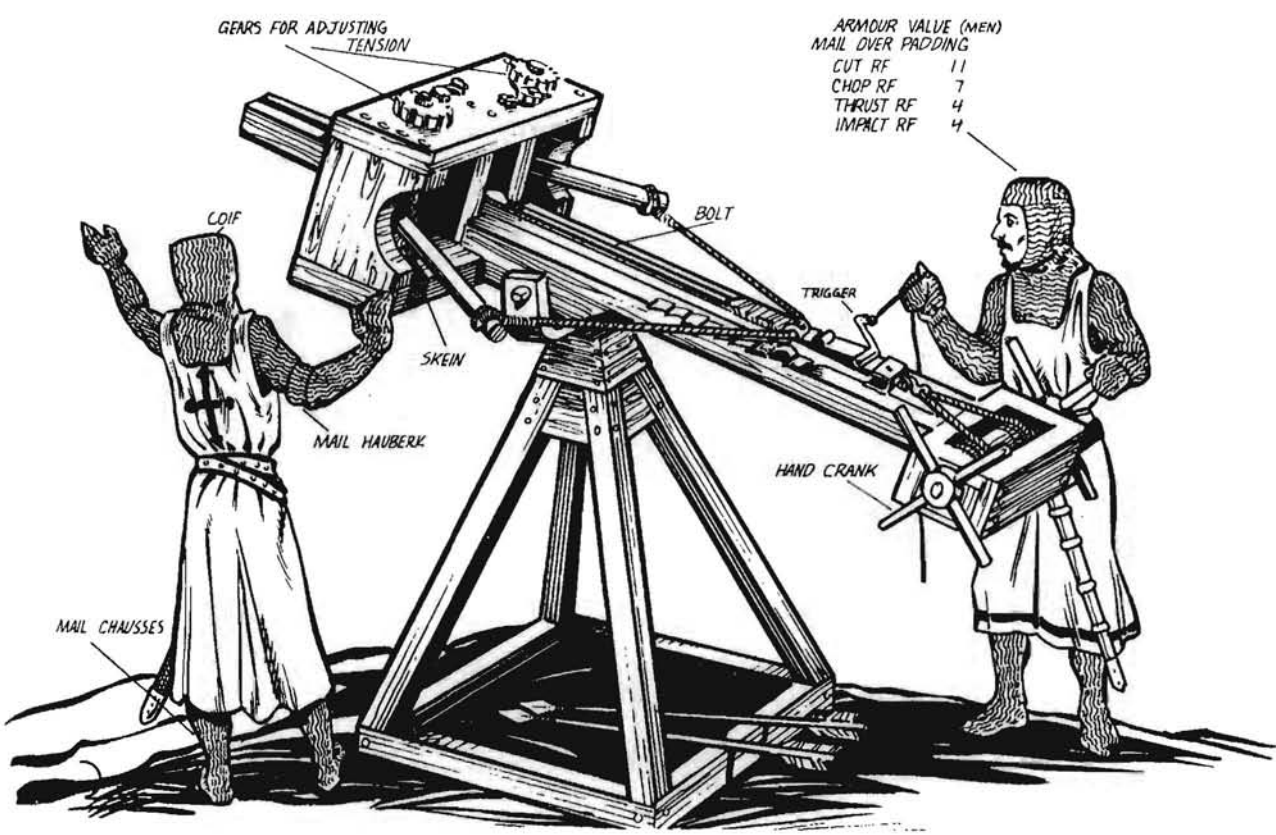

ONAGER
HURLS STONES
RANGER 375-400 METERS
WITH A 4kg STONE
SLING
ARM
SKEIN
ROMAN PLATE ARMOUR
CRANK MECHANISM
STAKES AND CHAINS
HOLD ONAGER IN
PLACE.
ARMOUR VALUE (MEN)
LAMINATED OVER MED. CLOTH
CUT RF 11
CHOP RF 9
THRUST RF 9
IMPACT RF 1


LARGE BALISTA
FOR HURLING STONES
RANGE 275-300 METERS
WITH A 10 Kg STONE
GEARS
FOR THE ADJUSTMENT OF SKEINS
SKEIN
POCKET FOR
STONE
SKEIN
ARM
CRANK MECHANISM

CATAPULT
HURLS STONES



BALLISTA
FOR FIRING BOLTS

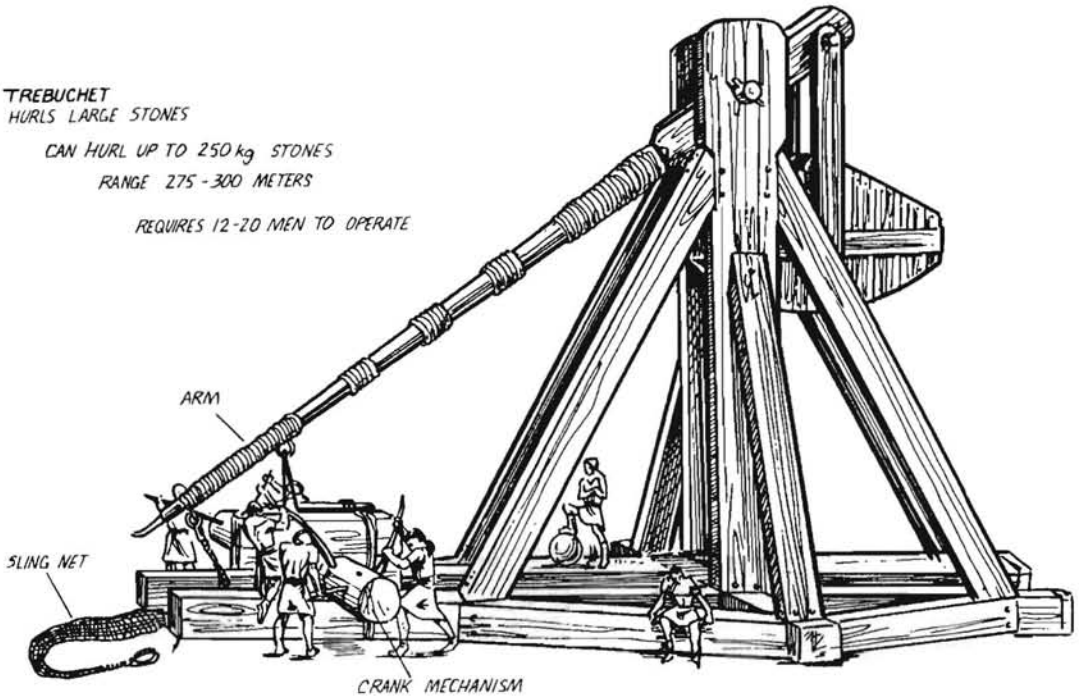


TREBUCHET
HURLS LARGE STONES

CAN HURL UP TO 250 kg STONES

RANGE 275 - 300 METERS

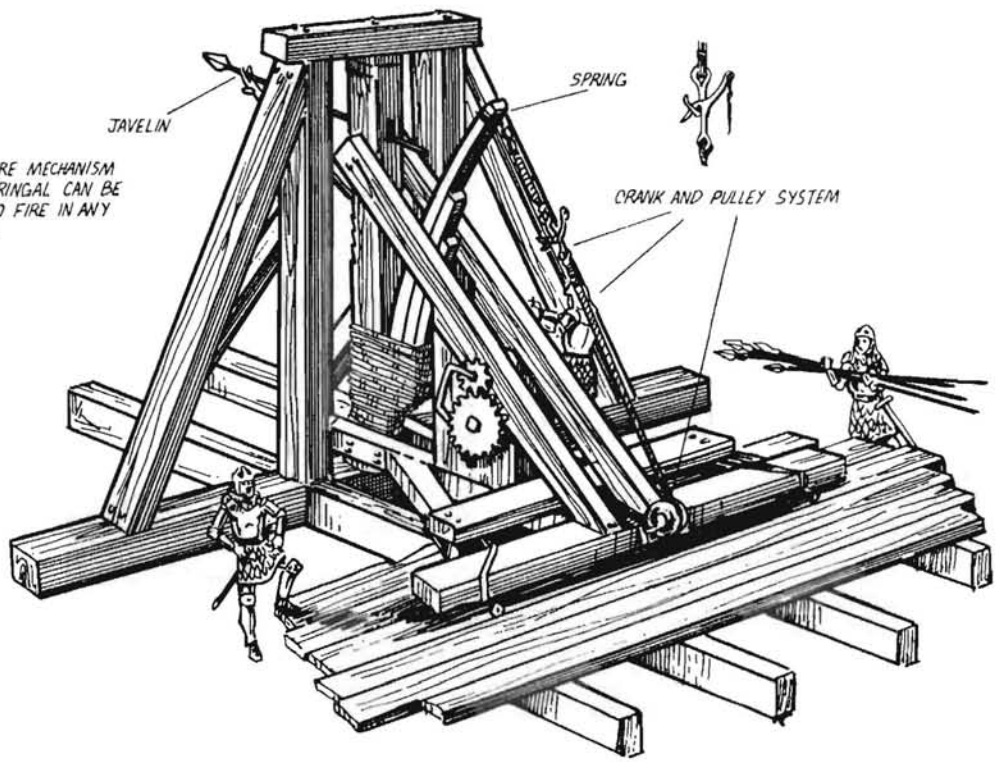
REQUIRES 12 - 20 MEN TO OPERATE

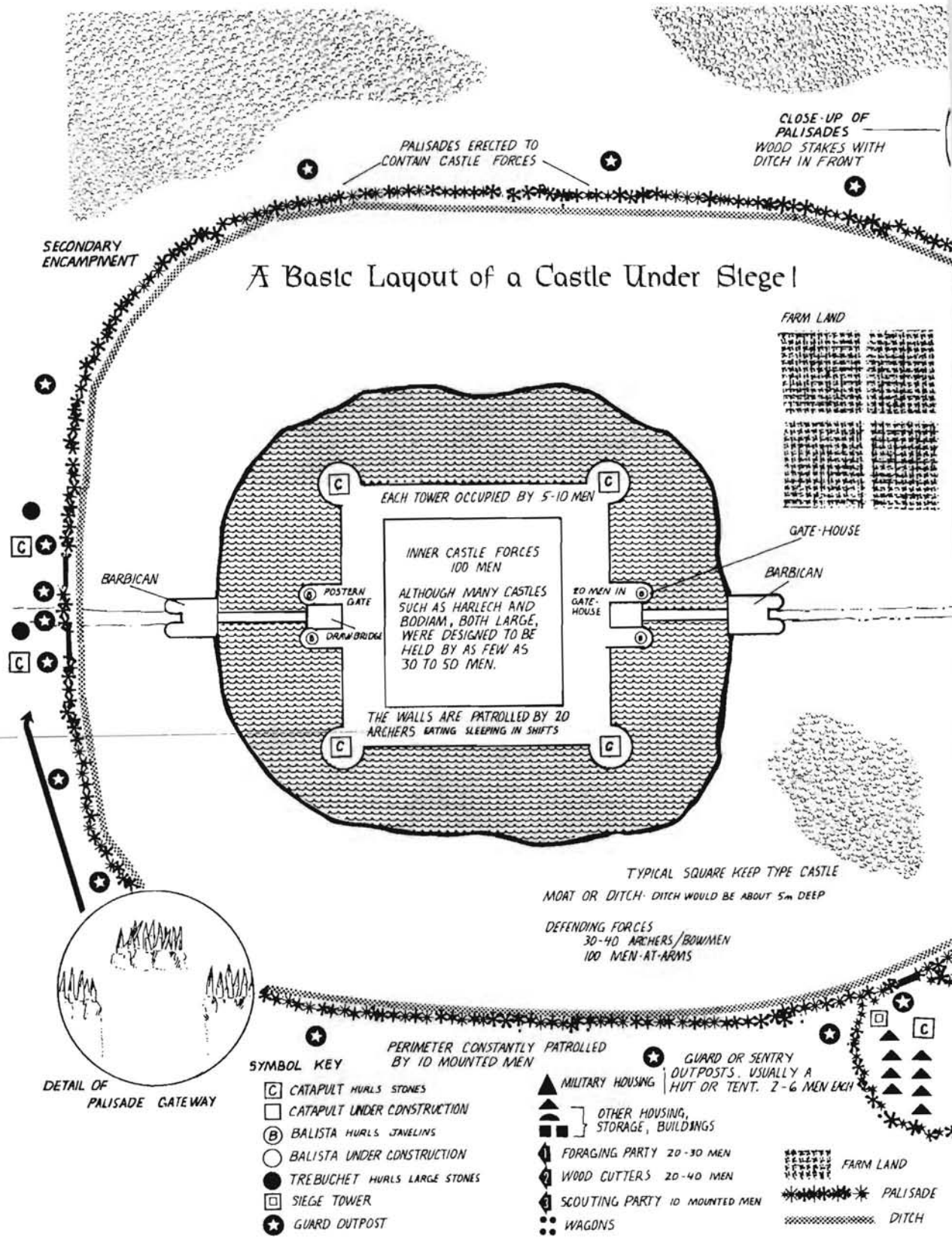


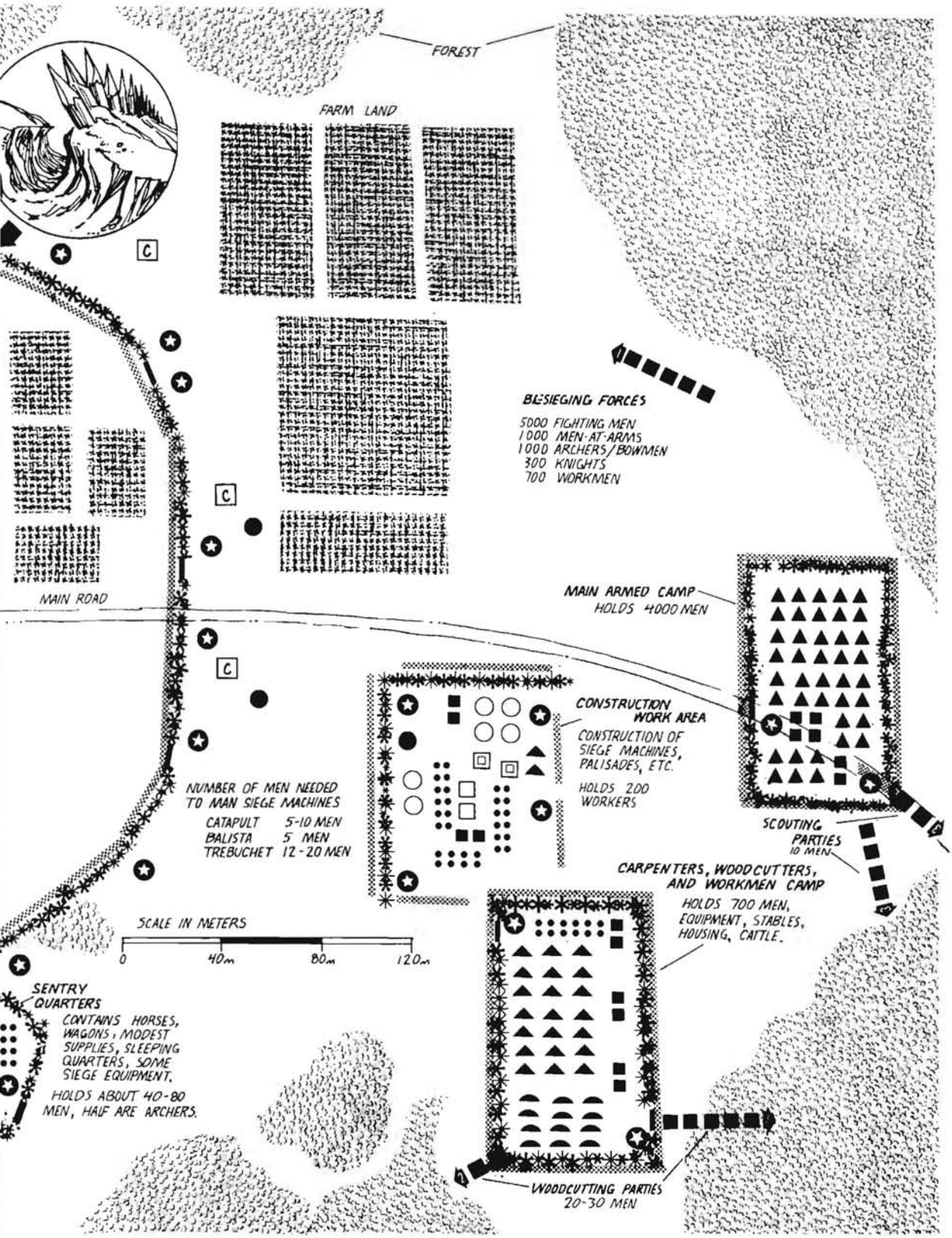
SPRINGAL OR SPRING ENGINE
FOR HURLING JAVELINS

RANGE 250 - 300 METERS

THE ENTIRE MECHANISM OF THE SPRINGAL CAN BE ROTATED TO FIRE IN ANY DIRECTION.

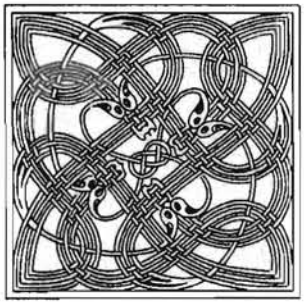



A Basic Layout of a Castle Under Siege!
CLOSE-UP OF PALISADES
WOOD STAKES WITH DITCH IN FRONT
PALISADES ERECTED TO CONTAIN CASTLE FORCES
SECONDARY ENCAMPMENT
FARM LAND
EACH TOWER OCCUPIED BY 5-10 MEN
INNER CASTLE FORCES 100 MEN
ALTHOUGH MANY CASTLES SUCH AS HARLECH AND BODIAM, BOTH LARGE, WERE DESIGNED TO BE HELD BY AS FEW AS 30 TO 50 MEN.
GATE-HOUSE
BARBICAN
POSTERN GATE
DRAW BRIDGE
20 MEN IN GATE-HOUSE
BARBICAN
THE WALLS ARE PATROLLED BY 20 ARCHERS EATING SLEEPING IN SHIFTS
TYPICAL SQUARE KEEP TYPE CASTLE
MOAT OR DITCH- DITCH WOULD BE ABOUT 5m DEEP
DEFENDING FORCES
30-40 ARCHERS/BOWMEN
100 MEN-AT-ARMS
DETAIL OF PALISADE GATEWAY
PERIMETER CONSTANTLY PATROLLED BY 10 MOUNTED MEN
SYMBOL KEY
CATAPULT HURLS STONES
CATAPULT UNDER CONSTRUCTION
BALISTA HURLS JAVELINS
BALISTA UNDER CONSTRUCTION
TREBUCHET HURLS LARGE STONES
SIEGE TOWER
GUARD OUTPOST
GUARD OR SENTRY OUTPOSTS. USUALLY A HUT OR TENT. 2-6 MEN EACH
MILITARY HOUSING
OTHER HOUSING, STORAGE, BUILDINGS
FORAGING PARTY 20-30 MEN
WOOD CUTTERS 20-40 MEN
SCOUTING PARTY 10 MOUNTED MEN
WAGONS
FARM LAND
PALISADE
DITCH


FOREST
FARM LAND
C
C
C
BESIEGING FORCES
5000 FIGHTING MEN
1000 MEN-AT-ARMS
1000 ARCHERS/BOWMEN
300 KNIGHTS
700 WORKMEN
MAIN ROAD
MAIN ARMED CAMP
HOLDS 4000 MEN
CONSTRUCTION WORK AREA
CONSTRUCTION OF SIEGE MACHINES, PALISADES, ETC.
HOLDS 200 WORKERS
NUMBER OF MEN NEEDED TO MAN SIEGE MACHINES
CATAPULT 5-10 MEN
BALISTA 5 MEN
TREBUCHET 12-20 MEN
SCOUTING PARTIES
10 MEN
CARPENTERS, WOODCUTTERS, AND WORKMEN CAMP
HOLDS 700 MEN, EQUIPMENT, STABLES, HOUSING, CATTLE.
SCALE IN METERS
0
40m
80m
120m
SENTRY QUARTERS
CONTAINS HORSES, WAGONS, MODEST SUPPLIES, SLEEPING QUARTERS, SOME SIEGE EQUIPMENT.
HOLDS ABOUT 40-80 MEN, HALF ARE ARCHERS.
WOODCUTTING PARTIES
20-30 MEN

Glossary

ARBALEST - crossbow
ARROW LOOPS - slots in walls from which arrows could be shot.
BAILEY - open area surrounded by castle walls.
BALISTA - siege engine resembling a crossbow; used mainly to shoot javelins.
BARBICAN - defensive works built out from the main castle walls.
BOLT/QUARREL - arrows shot from crossbow.
CATAPULT - siege engine used to throw stones.
CHEVAL-DE-FRISE - a large beam with spikes projecting from it; used to plug breeches in castle walls.
CLAW & BELT - a mechanism used to draw medium crossbows.
CRANEQUIN - a mechanism used to draw heavy crossbows.
CRENEL - the opening between two merlons on an embattlement.
DONJON - a keep.
DRAWBRIDGE - a movable bridge which can be drawn in to help isolate a castle or keep.
EMBATTLEMENT/BATTLEMENT - a fortified wall consisting of a rampart, merlons, and crenels.
FOSS - large ditch outside castle wall.
GOAT'S FOOT - a mechanism used to draw medium crossbows.
GREEK FIRE - a petroleum based substance used in firebombs or like a flamethrower.
HOARDINGS - covered wooden platforms placed on castle embattlements to enhance defense.
KEEP - the central building of a castle; usually heavily defended.
MACHICOLATIONS - stone structures built out over castle walls to enhance defense.
MANTLETS - large wooden shields built on wheels used to protect besiegers.
MERLON - the raised portion of a wall on embattlements; separated by crenels.
MOAT - a large ditch surrounding a castle or keep; often filled with water.
MOTTE - the large hill upon which early keeps were built.
MOUSE - a siege engine used to pick away at walls and masonary of castles.
MURDER HOLE - holes in interior passages through which arrows may be shot.
ONAGER - siege engine used to throw stones.
PALISADE - wall built of wooden poles.
PORTCULLIS - iron grid used to close off castle passages.
POSTERN GATE - small alternate gates on castle through which attacks could be launched on besiegers.
QUICKLIME - powder made from limestone which produces heat on contact with water.
RAM - a siege engine used to batter down doors.
RAMPART - the walkway behind the wall on an embattlement.
SAPPER - a person who conducted mining, battering, or other construction type jobs during sieges.
SCREW & HANDLE - a mechanism used to draw heavy crossbows.
SHUTTER - movable wooden shield mounted into crenels to provide extra protection to defenders.
SIEGE TOWER - a moveable tower with a bridge which can be lowered onto castle walls.
SKEIN - the cords consisting of sinews or hair which provide the torsion in some siege weapons.
SPRINGAL - siege engine used to shoot javelins.
TREBUCHET - siege engine used to throw large stones.
WARD - bailey.
WINDLASS - a mechanism used to draw heavy crossbows.



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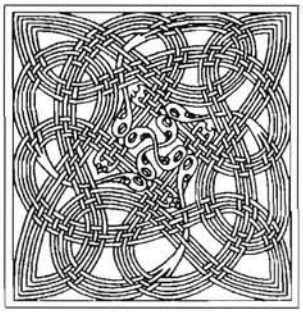

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_____; A Knight and His Horse
_____; A Knight and His Weapons
_____; The Sword in the Age of Chivalry
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Payne-Gallwey, BT, Sir Ralph; The Crossbow
Peterson, Harold; A History of Body Armor
Ratti, Oscar, and Westbrook, Adele; Secrets of the Samurai
Reid, William; Arms Through the Ages
Risebero, Bill; The Story of Western Architecture
Robinson, H. Russell; The Armour of Imperial Rome
Snodgrass, A.M.; Arms and Armor of the Greeks
Stone, George; A Glossary of the Construction, Decoration, and Use of Arms and Armour
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Wilkinson-Latham, Robert; Swords in Color
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_____; Medieval Warfare
Yadin; The Art of Warfare in Biblical Lands
Zygulski Jun, Zdzislaw; Bron w Dawnej Polsce

ARMOUR

To provide the fantasy gamer with a clear, concise reference book on armour at a reasonable cost is no easy task. For too long has this aspect of the hobby been overlooked, usually with serious side-effects. Often have I heard arguments from mis-informed people as to the weight, flexibility, and appearance of medieval armour; I cannot fault the average gamer however, as it was the designers of the games who should have done the initial research so as not to pass on faulty information.

As anyone who has done research on medieval armour can tell you, even the experts do not agree on many points. What is commonly called "banded mail" is not even known to have existed. Contrary to popular opinion, there is no contemporary account of a knight, even in the heaviest of jousting plate, being hoisted into the saddle.

Each of the armour types in the following list has several numerical values. These are as follows:

In all cases, "RF" means "Resistance Factor".

CUT RF A relative indication, called resistance factor (RF), of how well this type of armour stands up to cut attacks.

CHOP RF A relative indication of how resistant this type of armour is to chop attacks.

THRUST RF A relative indication of how resistant this type of armour is to thrust attacks.

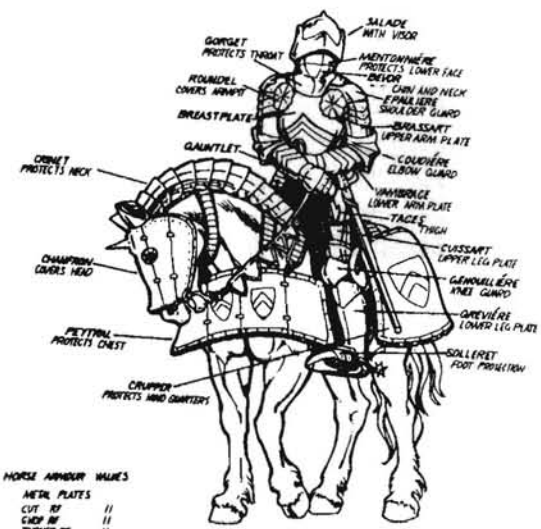
IMPACT RF A relative indication of how resistant this type of armour is to impact attacks.

DEX An indication of how much a suit of armour of this type would inhibit movement. The higher the number the slower the character would be due to less flexability, higher mass, etc.

MASS The mass of a suit of armour based on the wearer being 180cm (5'10") tall and 80kg (175lbs) in mass.

The main differences between a cut attack and a chop attack are the sharpness of the weapon and the curvature of the blade.

TABARD PERIOD
1430-1500



HORSE ARMOUR VALUES

METAL PLATES

CUT RF	11
CHOP RF	11
THRUST RF	11
IMPACT RF	1

LAMINATED METAL THE CRESNET

CUT RF	9
CHOP RF	9
THRUST RF	9
IMPACT RF	1
MASS TOTAL	34 kg

ARMOUR VALUES
PLATE OVER PADDING

CUT RF	15
CHOP RF	12
THRUST RF	13
IMPACT RF	4

LAMINATED SECTIONS OVER PADDING (EPAULIÈRE AND SOLLERET)

CUT RF	13
CHOP RF	10
THRUST RF	11
IMPACT RF	4
MASS TOTAL	30 kg

CHAIN MAIL PERIOD
1180-1250

ARMOUR VALUES
HEAUME OVER MAIL COIF

CUT RF	22
CHOP RF	18
THRUST RF	15
IMPACT RF	5

MAIL OVER PADDING

CUT RF	11
CHOP RF	7
THRUST RF	4
IMPACT RF	4
MASS TOTAL	30 kg

If you are using a system in which hit location is not needed and one general armour class is, the CHOP RF column may be used.

Thin cloth is equivalent to linen, medium cloth is equivalent to denim, and heavy cloth is equivalent to two or three thicknesses of medium cloth.

Soft leather is equivalent to the outer covering of a modern day leather jacket. Hard leather is approximately equal to five millimeters of leather.

Cuir-boulili is leather which has been boiled in oil. In this condition it may be molded into the desired shape and then upon drying it becomes very hard.

Quilt armour consists of two layers of cloth between which cotton or some other such material is sandwiched. Padded armour usually consists of a heavy layer of felt from four to eight centimeters thick.

Woven cord armour bears a resemblance to modern macrame.

Ring mail is simply metal rings sewn onto a suitable backing.

Studded armour, sometimes called pourpoint, consists of metal studs fastened to a suitable backing.

Bezainted armour, named because of its resemblance to a type of medieval coin, consists of metal discs secured with studs to a suitable backing.

Jazeraint armour, also known as scale armour, consists of scales of various sizes sewn or riveted onto a suitable backing.

Mail consists of small interlocking rings of metal each of which are individually made and riveted together.

Double mail is a variation of normal mail only the rings are thicker and closer together.

Augmented mail consists of normal mail with strips of leather put through the links.

Bar mail is similar to augmented mail only that small metal bars are put through the links.

Combined mail consists of small plates of metal interspaced with sections of normal mail.

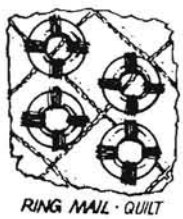
Brigandine armour consists of scales riveted inside a leather garment and then backed by another layer of leather.

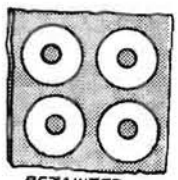
Laminated armour consists of metal strips which are overlapped and articulate upon each other.

Lamellar armour, also known as splint armour, consists of a series of splints or scales laced together. The size of the splints depends on the portion of the body it is to cover.

Plate armour consists of large pieces of metal which are either worn over other armour or are attached to one another by a series of straps, lacing, buckles, or screws. Ribbed plate is a variation of normal plate but with many artistic ribs which also serve to deflect blows of weapons. An average suit of plate in the early fifteenth century had a mass of approximately 25 to 30 kilograms (55 to 66 pounds) but a trained person could carry out most activities without undue strain; modern experiments have shown that a man in full plate can run, jump, and lie down and rise without too much trouble. The main disadvantage of this type of armour was not its weight but its stuffiness caused by lack of air and the sweat due to heat or physical exertion.

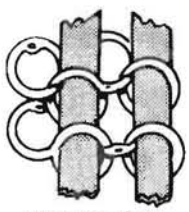
When considering a suit of armour from the above list it must be remembered that the various values and masses do not reflect the normal practice of wearing padding or other such garments under the armour to prevent chafing and to lessen the impact of blows. Characters in most forms of metallic armour should wear some sort of padding under it. When doing this or when layering different types of armour over one another, simply add all of the values in each category together.


RING MAIL · QUILT

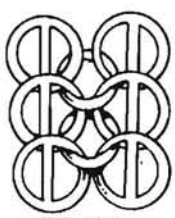

BEZAINTED
STUDS ON LEATHER

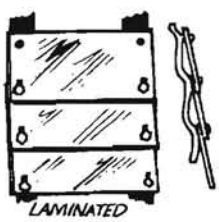

JAZERAINT

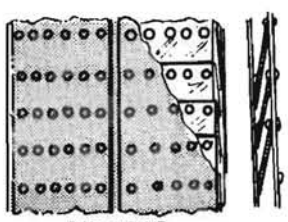

CHAIN MAIL

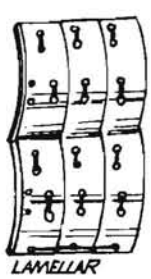

AUGMENT MAIL


DOUBLE MAIL


BAR MAIL

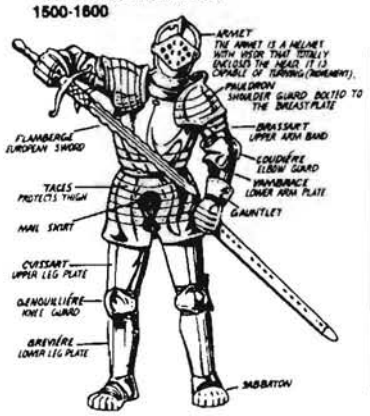

LAMINATED

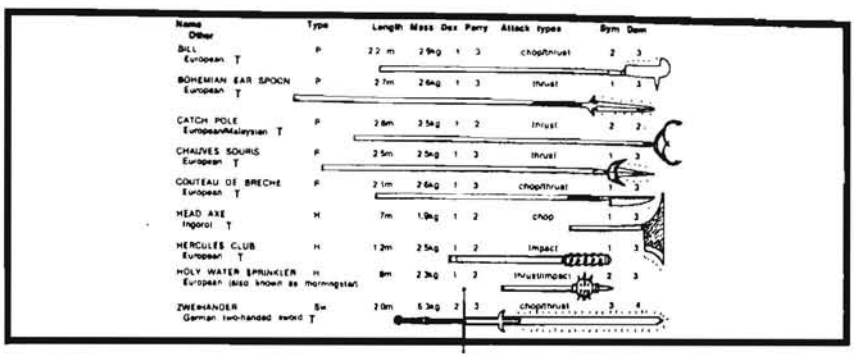

BRIGANDINE


LAMELLAR

ARMOUR TYPE	CUT RF	CHOP RF	THRUST RF	IMPACT RF	DEX	MASS
Thin cloth	1	0	0	0	0	1.3kg
Medium cloth	2	0	0	0	0	2.5kg
Heavy cloth	3	1	1	1	1	3.7kg
Soft leather	2	1	1	1	1	3.7kg
Hard leather	3	2	3	1	1	5kg
Cuir-boulili	5	3	5	1	1	5kg
Quilt	3	1	2	2	1	5kg
Padded	4	1	2	3	1	5kg
Woven cord	4	2	3	2	2	5kg
Heavy cloth ringmail	5	3	3	1	1	7.5kg
Soft leather ringmail	4	3	3	1	1	7.5kg
Hard leather ringmail	5	4	5	1	2	10kg
Quilt ringmail	5	3	4	2	2	10kg
Studded heavy cloth	3	1	1	1	1	6kg
Studded soft leather	3	1	1	1	1	6kg
Studded hard leather	4	2	3	1	2	7.5kg
Soft leather bezainted	6	5	3	1	2	7.5kg
Hard leather bezainted	7	6	5	1	2	10kg
Cuir-boulili bezainted	8	7	7	1	2	10kg
Quilt bezainted	6	5	4	2	2	10kg
Hard leather jazeraint	7	6	4	1	2	10kg
Cuir-boulili jazeraint	8	7	6	1	2	10kg
Hard wood jazeraint	6	5	4	1	2	10kg
Horn/bone jazeraint	8	7	6	1	2	15kg
Metal jazeraint	9	8	8	1	2	20kg
Mail	7	6	2	1	1	20kg
Double mail	9	7	4	1	2	22kg
Augmented mail	9	7	5	1	2	22kg
Bar mail	8	6	3	1	2	20kg
Combined mail	8	7	5	1	2	22kg
Hardwood brigandine	6	6	5	2	3	13kg
Horn/bone brigandine	8	8	7	2	3	15kg
Metal brigandine	9	9	8	2	3	22kg
Laminated	9	9	9	1	2	20kg
Cuir-boulili lamellar	8	7	7	1	3	10kg
Hard wood lamellar	6	6	5	1	3	10kg
Horn/bone lamellar	8	7	7	1	3	13kg
Metal lamellar	9	9	8	1	3	18kg
Plate	11	11	11	1	2	25kg
Ribbed plate	12	12	12	1	2	25kg

MAXIMILLIAN ARMOUR
1500-1600





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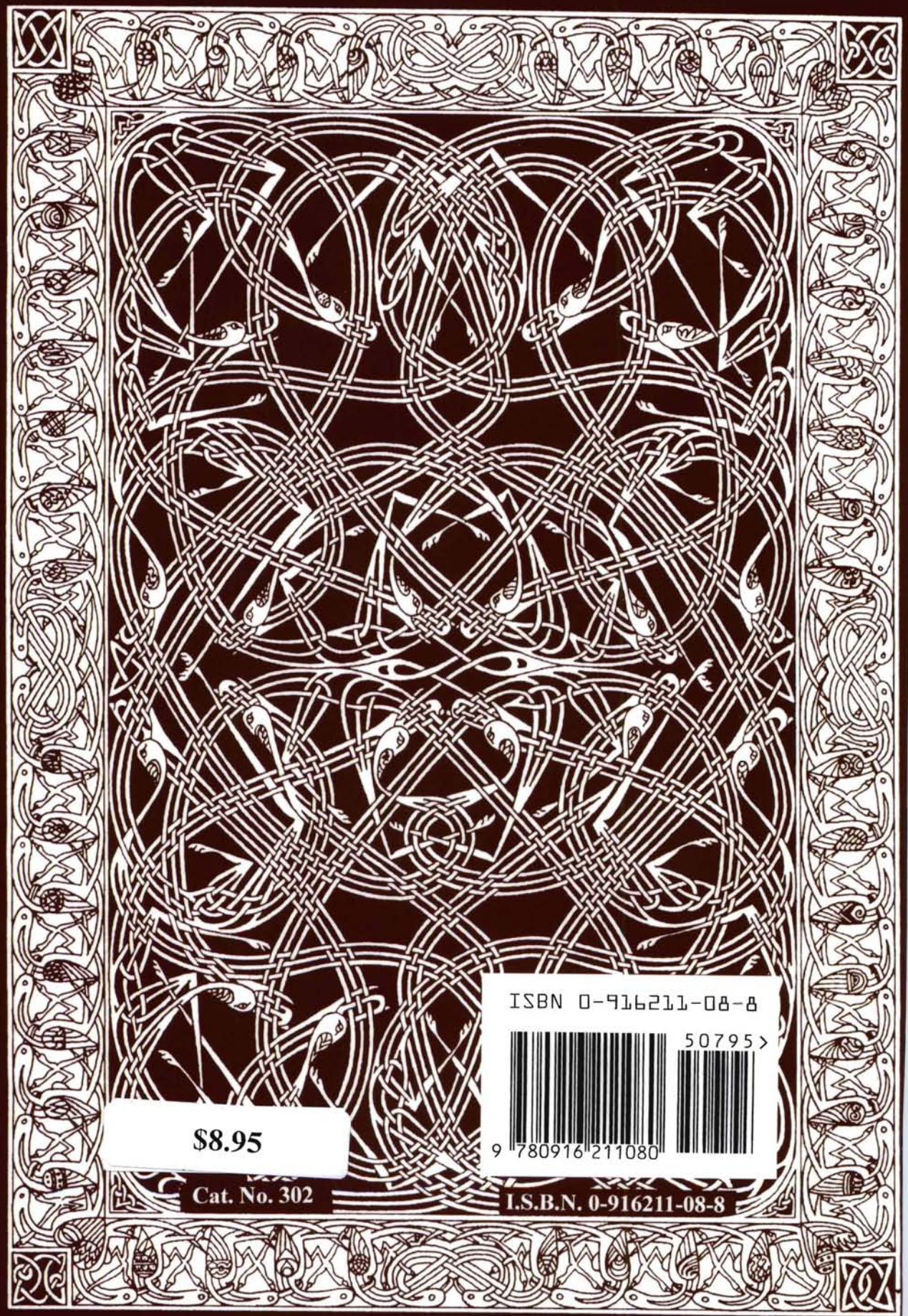
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