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Ships and Guns of the Tudor Navy 1495–1603

Robert Douglas Smith

Introduction

The 16th century witnessed the greatest change in the armament of the ships of the English Navy of any period before the end of the 19th century. At the end of the 15th century, royal ships were armed with many small guns, mainly anti-personnel weapons. A hundred years later they carried a complement of heavy cannon capable of firing a significant weight of shot. This short article is an attempt to chart the changes through the period and pinpoint just when they occurred. That this is possible is because, from the end of the fifteenth century to the beginning of the seventeenth, a number of inventories survive which detail the guns aboard the ships of the English Royal Navy. And, while the earlier inventories present us with some problems of interpretation, the group as a whole provide an unrivalled opportunity to review the changing armament of English ships through the century. Of equal importance is that they can provide the background to understanding the changes in tactics and warfare at sea, not just in England but in other European states.

Most of the inventories are lists of ships and how many guns of different types were aboard each of them.¹ Although the very first list from 1495 contains details of only two ships, from 1514 onwards the inventories deal with many more, for example 58 ships are listed in the 1546 inventory, ensuring that we are dealing with the broader picture of English naval armament. The inventories I will discuss date from 1495, 1514, 1540, 1546, 1558, 1576 and 1603.² The information from these lists can be supplemented by a number of other documents recording what cannon were owned by the state, what was required to arm a ship or ships, or what was in store. In addition, cannon from dated or known wrecks can help shed further light on the subject.

1495³

The first of the inventories, dated 1495, is contained within documents listing the stores and equipment of just two ships – the *Sovereign* and the *Regent*. What is significant is that only two types of guns are listed – serpentines, made of both iron and bronze, and stone guns (see Table 13.1).

Table 13.1 The guns on the *Sovereign* and the *Regent*.

	<i>Sovereign</i>	<i>Regent</i>
Serpentine – iron	109	151
Serpentine – bronze	1	30
Stone gun – iron	31	–

The problem we are presented with is just what these names are referring to. From the large numbers of serpentines listed it seems likely that they were small and it is tempting to think that the stone guns were larger; unfortunately, however, at present we cannot really be sure of this. Contemporary illustrations show a type of gun which may be a serpentine – a small calibre (approximately 50–75 mm) iron barrel with a separate powder chamber mounted on a wooden bed, the whole supported on an iron swivel. An example was found on an unidentified wreck discovered on the Goodwin Sands in the 1980s.

Though we only have a small amount of information, it seems likely that the tactics used at sea, at the turn of the 15th century, were based very much on ships coming alongside to enable the soldiers to fight one another. There does not appear to have been guns of sufficient size to inflict severe damage on the actual ships themselves.

1514⁴

Within twenty years there appears to have been a decisive change in the way that ships engaged and this is well illustrated by an inventory of 1514. From just the two ships at the end of the 15th century there are now thirteen and they are armed with a far more varied range of artillery which numbers some 783 iron and 68 bronze pieces (Table 13.2).

At first sight there are a bewildering number of different types of guns – some 23 varieties ranging from bombards to handguns (hackbuts). However on closer examination many of these 23 can be reduced to 4 basic variants – stone gun, serpentine, sling and murderer – plus a small group of miscellaneous pieces. What is also apparent is that the armament of the ships was now far more mixed with both

Table 13.2. The inventory of 1514.

		Henry Grace à Dieu	Trinity Sovereign	Gabryell Royle	Kateryn Forteleza	Grete Barbara	Grete Nicholas	John Baptist	Mary Roose	Petr Pome Gramett	Grete Elizabeth	Crist of Grenewich	Kateryn Galle	Roose Galle	TOTALS
Bronze	Bombard	1													1
	Curtow	1	3	1	1				5						11
	Demi-curtow		3												3
	Culverin	2	3	1									1		7
	Falcon	6	2	6	2	8		1	2	2					29
	Falconette								3						3
	Serpentine	1													4
	Vice piece	4													4
	Murderer								2		2				4
	Sling half										2				2
	Unspecified	1							1	1					3
Iron	Great gun of iron	18	7					10		5	16				59
	Great stone gun	2		2											4
	Stone gun	22		7	13	2	1		26	6	11	15		1	108
	Serpentine double					2		18		26			6	3	55
	Serpentine single			15		1		4		4	56	3			83
	Serpentine unspecified	122	62		26	13	11	12	28	6		23			321
	Serpentine small									25	28				53
	Sling double									2					2
	Sling ordinary	1	4	2	4		2	2		1		3	2	3	26
	Sling half				2				2		2				6
	Sling ringed														1
	Great murderer								1	6	6				13
	Murderer			3	14	10			3						30
	Murderer small						5								5
	Murderer unspecified											8		4	12
	Top gun							2	3	1		1			9
	Capstan gun									2					2
	Pot gun									4					4
	Hackbush														0
	Falcon			2											2
	Falcon half											1			1
	Organs			12											12
	Cast-iron piece						2	1	2						5
	Sling cast														2
	TOTALS	181	84	51	62	36	21	50	78	91	123	54	9	11	

smaller and larger guns, some of which are now capable of inflicting damage on a ship’s structure.

Unfortunately it is not always clear exactly what some of the guns listed were, how big they were or how large a shot they were capable of firing. Within the lists of bronze guns some are clearly of large calibre – the bombard, curtows, and culverins were all of large size for example. However the largest number of bronze pieces were the falcons, which are small guns more useful against men than wooden hulls.

Of the iron guns the large number listed can be reduced to four types – stone gun, serpentine, sling and murderer. The serpentines are probably the same guns as those in 1495 – small anti-personnel guns supported on a swivel – but what were stone guns? The name probably refers to the fact that they were loaded with stone shot but we have little more information about them or their size. Some were probably large, the great stone guns, but it is unclear if they were always so. In recent years a gun was recovered from a wreck found in off the coast near Poole in Dorset. The wreck has been tentatively dated to around 1520 and it is possible, though not conclusive, that this might be a stone gun. It has a bore of 17 cm (7 inches) and is mounted on a wooden bed with a separate breech chamber. Still inside the barrel is a stone shot. The other major types in the 1524 list, the sling and the murderer, are difficult to identify at this period with any certainty.

What is clear though from this inventory, is that the armament of the royal ships had undergone significant change over the years since 1495. The larger ships were being armed with larger guns – guns capable of inflicting damage to an enemy ship. However there were significant numbers of smaller guns showing that coming alongside and boarding were still the primary tactics for ship-to-ship conflict though now it may have been possible to inflict structural damage on the enemy before the serious business of hand-to-hand fighting got underway. We can deduce that ships were armed with a variety of armament which allowed them to make significant damage to other ships, but also able to use earlier boarding forms of sea warfare.

1540

The next inventory, dated 1540, lists 10 ships armed with a total of 546 iron and 86 bronze pieces (Table 13.3).

What is immediately obvious is that the number of different types of guns has gone down dramatically. Now instead of the plethora of gun names seen in the 1514 list we have just seven types of iron guns and eight types of bronze. And within those groups there is also more uniformity. Of the seven type of iron gun there are just 4 basic divisions – port piece, sling, fowler and base. The slings are described as being a double sling, a single sling (sometimes called a whole sling), and a quarter sling. It is unclear exactly what these refer to, though it is likely that they refer to the weight of the shot fired – the double sling firing shot twice the weight of the sling and the quarter sling, a quarter. Similarly there are double and single bases – the former probably firing a shot twice the weigh

Table 13.3. The inventory of 1540.

Bronze										Iron							
	Cannon	Demi cannon	Culverin	Demi culverin	Saker	Fawcon	Fawconette	Fowler	TOTAL	Port piece	Double sling	Single sling	Quarter sling	Fowler	Double base	Single base	TOTAL
Ship					1	2			3	7		2		2	2	20	33
Lion					5	2	1		8	9		4		2	8	16	39
Swepestate					1	1			2	6	2	3		4	6	21	42
Genet					3	1	1		7	10	6			2	17	10	45
Primrose				2	6				10	10	4	3			30	10	57
Small Galye	2			2	4	2			13	12		2			50	10	74
Great Galye	5			2	1	1			5	11		7		1	30		49
Trentye Herre		1		1	2	2			9	9		6		2	33		50
Mynyon		2		1	4	2			14	10		4	5	5	52		76
Peter	2	2	1		5			4	15	9		6		6	60		81
Mary Rose		4	2	2	5	2			86	93	12	37	5	24	288	87	546
TOTALS	9	9	3	14	32	13	2	4									

of the latter. The 8 bronze guns fall into 5 main categories – cannon, culverin, saker, fawcon and fowler.

Although at first sight there appears to be significant change between 1514 and 1540, a closer examination reveals that the situation is so greatly different. Ships were armed primarily with smaller calibre weapons, more useful for anti-personnel use, than with larger guns. However there is definitely increase in the numbers of larger guns and, more importantly, a move towards a more uniform and less diverse complement of pieces. Tactics of fighting at sea would appear not to have changed too much – the larger ships able to inflict some damage on an enemy vessel though there is still a greater emphasis on anti-personnel weapons and boarding.

1546⁵

In 1546 an inventory of the King’s navy was made by the then Clerk of the Ordnance in the Tower of London, Anthony Anthony. This inventory lists the armament of each vessel below a coloured image of the ship. It lists the “*Ordenaunce, artillery, munitions, habillimentes for warre, for the arming and in the defence of the sayd shippe to the see*”, as well as the tonnage, and numbers of men separated into soldiers, mariners and gunners. No less than 58 ships

of all sizes are listed with a total of 1815 iron and 256 bronze pieces. See Tables 13.4a and 13.4b.

At first sight this inventory appears very complex and confusing, listing, as it does, so many different types and names for guns, both iron and bronze. It does seem to indicate a dramatic rise, since the 1540 inventory, of the different categories of guns. A possible explanation is that the enormous explosion in the size of the navy has meant that every weapon in store has been brought out to arm them all – there were 10 ships in 1540 and nearly 60 in this list.

Of the iron guns, 11 variants are listed of 9 different types – the sling having two further categories, the demi and quarter sling. The most common iron gun was the base, making up almost half of all the iron guns listed. This seems to occupy the space/use of the serpentine of the earlier inventories; the base was essentially again a short range anti-personnel weapon. The second most common gun, making up just over a quarter of the assemblage, is the hailshot piece. And here modern excavation, from the wreck of the *Mary Rose*, has helped to identify what a hailshot piece is – a short, small calibre weapon which fired a charge of small anti-personnel pellets – similar in appearance and use to the later blunderbuss. This means

Table 13.4a. The iron guns from the inventory of 1546, the Anthony Roll.

Ship	Demi culverin	Fawconette	Saker	Port piece	Fowler	Sling	Demi sling	Quarter sling	Base	Top piece	Hail shot piece	Total
Henry Grace à dieu				14	8	4	2		60	2	40	130
Mary Rose	3			12	6	2		1	30	2	20	76
The Peter				16	4		2	2	66	2	20	112
The Mathew				16		2		2	48	2	2	72
The Great Bark				10	6	2	2		30	1	20	71
Jesus of Lubeck				4	4	10			12	2	20	52
The Pauncey				12	9		4		24	1	20	70
Murrian				4		4			12	1	6	27
Strufe				6	2	4			12	1	12	37
Mary Hambrough				6	2		2		12	1	12	35
Christopher			1	2			2		12		12	29
Trinity Harry	1			10	4		5		12	1	12	45
Samuel Barke				12			5		46	1	12	76
Sweepstake					4		4		29	1	12	50
Mynnion				12	3	4			33	1	12	65
Lartyque			1				3	4	8	1	4	21
Mary Thomas			1	2			5		10	1	4	23
Hoye Barke				2	2			2	6		6	18
George				2			1		8		4	15
Mary Jamye			1	2			5		10		4	22
Grande Masterys				2	2		2		12	1	12	31
Anne Gallante						1			12	1	12	26
The Harte	3		2	4		2			12	1	12	36
The Antelop	3		2	4		2			12	1	8	32
The Tegar	4			4				2	12		4	26
The Bulle	4			4				2	12		4	26
The Salamander				8	3		2		17	1	12	43

Table 13.4a continued.

Ship	Demi culverin	Fawconette	Saker	Port piece	Fowler	Sling	Demi sling	Quarter sling	Base	Top piece	Hail shot piece	Total
<i>The Unicorn</i>			1	2	2		3		12	1	8	29
<i>The Swallowe</i>	1			6			3		20	1	12	43
<i>The Galie Subtille</i>					2				14		12	28
<i>The Newe Barke</i>				9	6		1		20	1	6	43
<i>The Greyhounde</i>							3		12	1	6	22
<i>The Jennet</i>	1		2						10	1	6	20
<i>The Lyon</i>				3	3			3	18		4	36
<i>The Dragon</i>			2		2		4		20		6	34
<i>The Phawcon</i>								2	20		4	26
<i>The Sacar</i>					2				12		2	16
<i>The Hynde</i>								3	14		4	21
<i>The Roo</i>									12		6	18
<i>The Phenyx</i>				2				2	10		4	18
<i>The Marlion</i>									8		4	12
<i>The Less Penace</i>		1	1		2				6		3	13
<i>The Bryggenden</i>									10		2	12
<i>The Hare</i>									12		4	16
<i>The Tregge</i>									12		4	16
<i>The Double Rose</i>									6		4	10
<i>The Flowre de Luce</i>									7		4	11
<i>The Portquillice</i>									6		4	10
<i>The Harpe</i>									6		3	9
<i>The Clowde in the Sonne</i>								1	6		3	10
<i>The Rose in the Sonne</i>									6		4	10
<i>The Hawthorne</i>									6		3	9
<i>The Ostrydge Fethers</i>									6		3	9
<i>The Fawcon in the Fetherlock</i>									8		4	12
<i>The Maydenhede</i>									6		3	9
<i>The Rose Slype</i>									6		3	9
<i>The Sylver Flowre</i>									5		3	8
<i>The Sonne</i>									7		3	10
Total	20	1	14	197	78	37	60	26	892	31	459	1815

Table 13.4b. The bronze guns from the inventory of 1546, the Anthony Roll.

Ship	Cannon	Demi cannon	Culverin	Culverin perier	Long culverin	Short culverin	Demi culverin	Saker	Cannon perier	Minion	Fawcon	Fawconette	Curtall	Double base	Chamber piece	TOTAL
<i>Henry Grace à dieu</i>	4	3	4				2	4	2		2					21
<i>Mary Rose</i>	2	2	2				6	2			1					15
<i>The Peter</i>		2	2				4	4			2					14
<i>The Mathew</i>		2					5	3								10
<i>The Great Bark</i>		5	2				3	2								12
<i>Jesus of Lubeck</i>	2		2					2								6
<i>The Pauncey</i>		4	2				3	4								13
<i>Murrian</i>			2					2								4
<i>Strife</i>			2					2								4
<i>Mary Hambrough</i>							2	2			1					5
<i>Christopher</i>			2					1			1					4

Table 13.4b continued.

Ship	Cannon	Demi cannon	Culverin	Culverin perier	Long culverin	Short culverin	Demi culverin	Saker	Cannon perier	Minion	Fawcon	Fawconette	Curtall	Double base	Chamber piece	TOTAL
Trinity Harry		1						4								5
Samuel Barke		2	1				1	5	2							11
Sweepstake		2	1				3	2								8
Mynnion							1	1			2					4
Lartyque										1						1
Mary Thomas										1						1
Hoye Barke											1					1
George							1	1								2
Mary Jamye										1						1
Grande Masterys		2	4					1								7
Anne Gallante					2	2	2						1			7
The Harte		1	3													4
The Antelop		1	3													4
The Tegar			1				2									3
The Bulle			2				2	1								5
The Salamander			2				2	4								8
The Unicorn			1				1	2	1							5
The Swallowe		1					1	4								6
The Galie Subtille	1							2								3
The Newe Barke							1	3	1							5
The Greyhounde			1					2	2		2	1				8
The Jennet			1					2								3
The Lyon								2			1					3
The Dragon								1						1		2
The Phawcon								4								4
The Sacar								2								2
The Hynde								1								1
The Roo				1			2								2	5
The Phenyx								2								2
The Marlion										3	1					4
The Less Penace											1					1
The Bryggenden											1	2				3
The Hare								1								1
The Tregre																0
The Double Rose							1									1
The Flowre de Luce							1	1								2
The Portquille								1								1
The Harpe								1								1
The Clowde in the Sonne							1	1								2
The Rose in the Sonne							1									1
The Hawthorne								1								1
The Ostrydge Fethers								1								1
The Fawcon in the Fetherlock							1				2					3
The Maydenhede								1								1
The Rose Slupe								1								1
The Sylver Flowre								1								1
The Sonne								1			1					2
Total	9	28	40	1	2	2	49	85	8	6	19	3	1	1	2	256

that some three quarters of the iron guns, a total of 1351 pieces, were short-range anti personnel weapons.

Just over one tenth of the iron guns are a type called a port piece, a category which, until relatively recently, could not be positively identified. However, as with the hail shot piece, excavations of the wreck of the *Mary Rose*, has shown them to be large calibre, around 20 cm (8 inches), wrought-iron guns which fired stone shot. Excavation has also shown that they were seen, at the time, to be as important as the large calibre bronze guns as both were mounted on the main gundeck side by side.

The 15 different types of bronze guns cans be split into 9 separate categories. Of these, the commonest types were the demi-cannon, shooting a cast-iron shot of 32 lb, the culverin firing a shot of 18 lb and the saker, firing the much smaller shot of just under 6 lb. What is remarkable about the 1546 inventory is the huge number of ships and the huge range of guns listed. However it does not show a significant change in the way that ships were armed. Most of the guns were still of small calibre and many were purely for anti-personnel use. In warfare at sea, boarding was, still very much as previously, viewed as the predominant tactic though the possibility of doing some damage to the enemy’s hull had increased.

1558⁶

This inventory differs from the others in that instead of listing the armaments of individual ships, it is a summary of the guns for the whole fleet and those held in store (Table 13.5).

It is interesting on a number of counts. First there is now a separate listing for cast iron cannon though the numbers are quite small. The wrought iron guns are again dominated by the smaller types – some two-thirds are bases of various types – but the hailshot pieces of the 1546 inventory have almost completely disappeared.

The bronze guns are very similar to those in the earlier list with the emphasis on smaller calibre guns – over half are sakers or smaller calibre pieces.

This listing then shows the continuity of the preceding years. Ships are armed with large numbers of smaller guns augmented by a complement of larger calibre pieces both iron and bronze.

1576⁷

The next inventory is dated 1576 and shows a real change from the one taken less than 20 years previously (Table 13.6).

Twenty-one ships are listed as armed with 152 iron and 639 bronze guns. And here we can see the first change – from a predominance of iron (that is, of course, wrought iron), to that of bronze pieces. But there are other equally significant changes. There are now just 3 types of iron gun – fowler, base and top piece, although in fact only 2 top pieces are actually included. All three types are small calibre anti-personnel weapons. However it is the bronze gun categories that show real change. Though there are 13 different names, there are just 8

Table 13.5. The inventory of 1576.

	On ship	In store	TOTALS
Brass			
Cannon	0	0	0
Cannon perier	16	6	22
Demi cannon	14	2	16
Culverin	30	7	37
Demi culverin	54	8	62
Saker	80	6	86
Minion	20	2	22
Fawcon	41	16	57
Fawconnet	9	1	10
Total	264	48	312
Cast iron			
Demi culverin	13	3	16
Saker	25	5	30
Fawcon	8	0	8
Fawconnet	2	0	2
Total	48	8	56
Forged iron			
Port pieces	62	32	94
Fowlers	71	23	94
Whole slings	0	3	3
Demi slings	9	20	29
Quarter slings	11	24	35
Top pieces	3	1	4
Double ring bases	6	3	9
Double bases	128	33	161
Single bases	355	94	449
Single ring bases	0	11	11
Wagon bases	46	0	46
Double of iron	0	6	6
Flawmouthes	0	8	8
Total	691	258	949

types of bronze guns. But something more significant is also going on. Now almost half of the bronze guns can be classed as the large calibre guns – culverins or cannon. It appears that the armament of the ships was getting heavier with more guns of a larger calibre. And interestingly the port pieces, formerly made from wrought iron, are now also made from bronze.

So it would appear that in the twenty years prior to 1576 the major change to the armament of ships occurred. Now, instead of a preponderance of smaller guns, mostly anti-personnel weapons, ships are now armed with large calibre guns capable of inflicting damage on the hulls of their enemy’s hulls. The tactics of sea warfare are now more based on firing a significant weight of cast iron shot at your enemy from a longer range. This is not to say that boarding was not important but it is clear that more of the fighting, the destruction and softening up of the enemy, could be done first. It must always be remembered that although beating the enemy was of paramount importance, capturing an enemy ship was also a much desired outcome

Table 13.6. The inventory of 1603.

	Demi cannon	Demi cannon perier	Cannon perier	Culverin	Culverin perier	Demi culverin	Saker	Minion	Fawcon	Lizard	Fawconette	Fowler	Port piece	Forged fowler	Base	Double base	Top piece	TOTAL
<i>Elizabeth Jonas</i>	8		4	6		8	7	2	2			4	4	8	22			75
<i>Tryumpe</i>	8		5	14		7	10	2	2			4	2	4	2			60
<i>Beare</i>	6		6	13		12	12	2	2					6				59
<i>Victorie</i>	6		4	14		4	4	2						8	2			44
<i>Hoape</i>	1		2	7		10	4	4	1		1	2	4	6	6			48
<i>Marie Rose</i>	4		2	8		6	8						2	4	4			38
<i>Slip and Marie</i>	4		2	4		6	13	2	2			2		9		2		46
<i>Lion</i>	4	2	2	6	1	7	6	2	2			8	2					42
<i>Elizabeth Bonaventure</i>	2		2	5		10	8	2	2			1	3	4	5			44
<i>Dreadnought</i>			2	4		8	6	4	4			8						36
<i>Swiftsure</i>			4	4		9	6	2	2			6						33
<i>Antelope</i>				2		7	9	2	2				4	2	8			36
<i>Swallowe</i>						4	13	3	6		1			4	6	2	2	41
<i>Foresight</i>						10	9	4				1		2	2			28
<i>Gemiet</i>						4	9	4	5					6	2			30
<i>Aid</i>						2	13		6		1	6						28
<i>Bull</i>						7	8	2	2					4	2			25
<i>Teigre</i>						6	10	3						4	2			25
<i>Achates</i>							2	2	8			2			2			16
<i>Handemaide</i>							2	2	7		2	4						17
<i>Barke Boolean</i>							1		6	1	2			2	8			20
TOTALS	43	2	35	87	1	127	160	46	61	1	7	48	21	73	73	4	2	791

Table 13.7.

	Bronze pieces										Iron guns									
	Cannon perier	Demi cannon	Culverin	Culverin perier	Demi culverin	Saker	Minion	Fawcon	Fawconette	Curtall	Port piece	Fowler	Total	Culverin	Demi culverin	Saker	Minion	Fawcon	Total	
Elizabeth Jonas	3	2	18		13	19	1					2	58						0	
Tryumph	4	3	19		16	13						4	59						0	
Beare	2	6	21		16	12							57						0	
Merehonor		4	15		16	4						2	41						0	
Arke Royal	4	4	12		12	6					4	2	44						0	
Guardland			16		12	2					2	2	34		2	2			4	
Due Repulse	2	3	13		14	6					2	2	42						0	
Waspye	2	2	14		10	4					2	4	38						0	
Defiance			14		14	6					2	2	38						0	
Mary Rose		4	10		7	4					4		29	1	3				4	
Elizabeth Bonaventure	2	2	11		14	4	2				2	2	39						0	
Nonperalia	2	3	7		8	12					4	4	40						0	
Lyon		4	8		12	9		1				8	42		2				2	
Victorie												7	7	8	9	2			19	
Raynebowe		6	10		7	1						4	28						0	
Dreadnought	2		4		11	10		2				4	33						0	
Swiftsure	2		5		8	6		2				4	27		4	3			7	
Hope	2	4	9		12	4					4	2	37						0	
Yaunguarde		4	14		16	4	2	2					42						0	
St Mathias	4	4	16		10	2	3	2					41		6	2	1		9	
St Andrewe			4	2	7	3	1			2		4	23	2	14	4	1		21	
Antiloppe			4		5	4		1			2	2	18		8	4			12	
Adventure			4		11	7						2	24						0	
Advantage					6	8	2						16				4		4	
Crane					2	2	6					2	12		4	5			9	
Tremountara						12	7	2					21						0	
Quittance					4	4		2				2	12	2	2	3	4		11	
Answerare					2	2	2	2				2	10		3	4			7	
TOTALS	31	55	248	2	265	170	26	16	0	2	28	69	912	13	57	29	10	0	109	

– a prize was worth a lot of money from which all the crew, from master to cabin boy, benefitted financially.

1603⁸

The final inventory, dated 1603, lists the armament of 28 ships, and shows that the changes continued through the last quarter of the century (Table 13.7).

The first change is that the cannon on ships were either made from bronze or from cast iron and that wrought-iron guns were no longer used in the Royal Navy. Even those guns which were traditionally made from wrought iron, for example port pieces and fowlers, were now made of bronze. However, of the 1021 guns listed, just 36 are made from cast iron – 9 culverins, 20 demi-culverins and 7 sakers. What is interesting is that, though the English had been successfully producing cast iron artillery since the 1540s, the navy still preferred to use bronze pieces. And in fact, it was not till the 1640s that they were to move away from bronze and arm the fleet with cast iron cannon.⁹ Interestingly there are still quite a number of different types of guns though the number of unusual pieces was now very small.

However the major change is that the ships were armed predominantly with ‘big guns – almost two thirds of the total armament are large calibre guns: cannon, culverins and demi-culverins. At the beginning of the seventeenth century, ships had become floating fortresses, capable of firing a very significant weight of cast-iron shot. And it is here where the seeds of the later pre-eminence of the English navy can be traced. Though large guns and firepower were never the only way to success at sea, the experience gained over the last decades of the sixteenth century were probably very significant.

Conclusions

This very brief survey of the inventories from the late fifteenth to the early sixteenth centuries has allowed us to chart the changes in ships’ armament over the sixteenth century. For the first fifty years they were armed predominantly with large numbers of smaller guns, the majority of which were made from wrought

iron, augmented by a small – but increasing – number of larger guns.

Between the 1550s and 1576 there was a significant change. Now there are far fewer iron pieces and ships were armed primarily with bronze guns. Increasingly too these pieces were larger and heavier in size than before and it is clear that ships were changing and becoming more like floating artillery platforms. And this continues through the last quarter of the century, till by the beginning of the seventeenth century, the ships of the Royal Navy were armed predominantly with great numbers of large calibre bronze guns. What is equally important is that the royal ships were armed with bronze and not cast iron cannon – a move which does not occur until the 1640s.

Notes

- 1 It has been necessary to simplify some of the inventories in the tables which accompany this article as the originals are often very complex and in a short article it is not always possible to provide every small detail. This in no way affects the overall argument put forward in the discussion.
- 2 There are a few other inventories but this group provides the basis to understand the changes in armament through the century. An inventory of 1547 for example is extensive but adds nothing new to that of 1546.
- 3 The lists of ships stores from which these figures are taken can be found in Oppenheim, M., *Naval Accounts and Inventories of Henry VII 1485–8 and 1495–7*. Naval Records Society, volume 8, 1896, page 194, 205.
- 4 National Archives, Kew, PRO E 36/13
- 5 The inventory is now in two parts, one held at the British Library, London, Additional MS 22047, and the other, and larger part, is preserved in the library of Magdalene College, Cambridge, Pepys library 2991.
- 6 National Archives, Kew, SP12/3 ff.136–139
- 7 National Maritime Museum, Greenwich, CAD/C/1
- 8 British Library, London, Royal MS 17a XXXI
- 9 See Brown, R. R., ‘The thundering cannon: guns for the English Navy in the 17th century’. In *A farewell to arms, Studies on the history of arms and armour*. Legermuseum, Delft, 2004