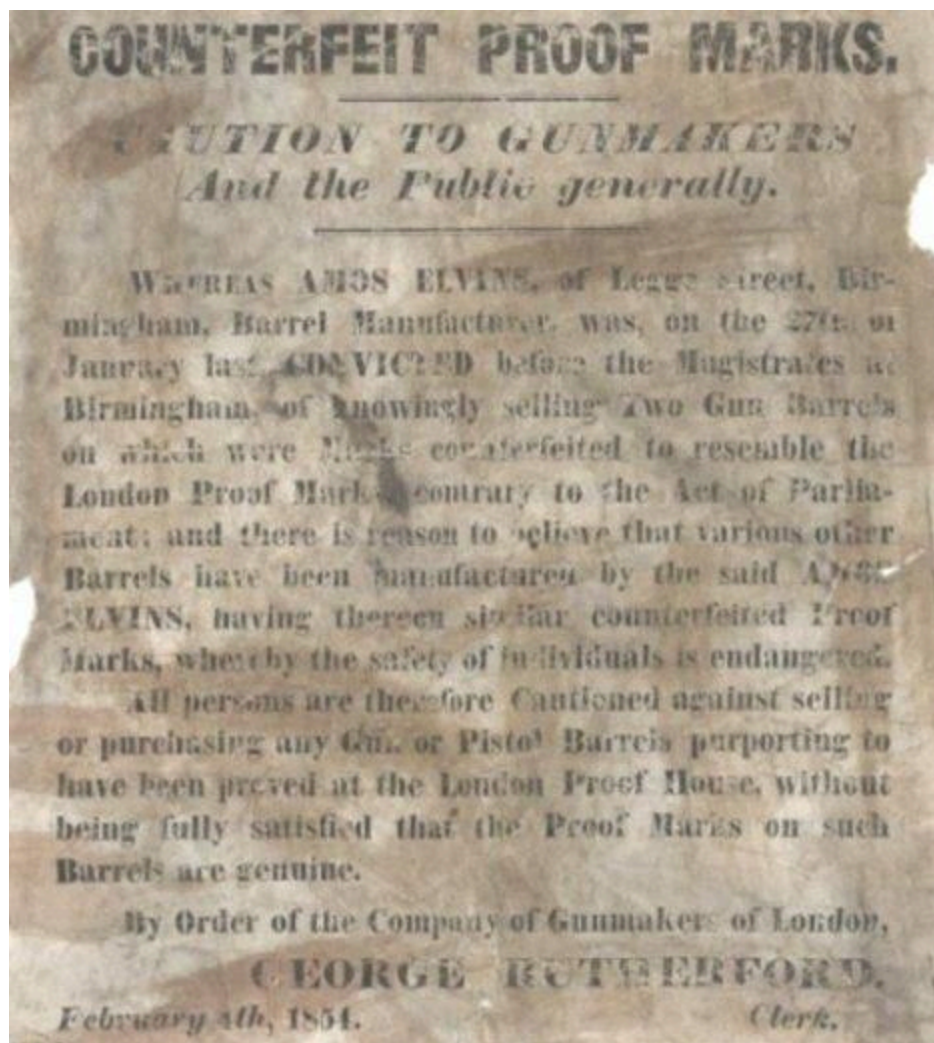


Damascus Quality

John Ruskin (1819-1900)

There is hardly anything
in the world
that some man
cannot make a little worse
cannot make a little cheaper
and the people
who consider price only
are this man's lawful prey.

CAUTION



“Joseph Manton London” with Belgian proof marks



“John Buckingham”

Cheaply made Belgian guns with Twist barrels, frequently with ‘British’ sounding names and occasionally with counterfeit London or Birmingham proof marks, may be labeled “Laminated Steel”, especially after about 1895.



“London Damascus” was a lower grade damascus offered by Ferdinand Drissen



We can look back to the barrels used on English ‘Best Guns’ to determine what was perceived as of the highest quality in any period, and Purdey would of course be a good example.

Stub Twist was used 1820s-40s, then both Stub Twist and an early Laminated Steel into the 1860s.

Crolle Damascus was available in the 1820s, but “English Two Stripe” was not in general use until the mid-1800s, and with Three Iron “Oxford” and a later Laminated Steel, was used c. 1850-1890s.

Four Iron “Turkish” similar to Parker D4 appeared after 1870, although most ‘Best Guns’ used Three Iron.

The first Purdey with Whitworth steel was 1880.

Lower quality English and Belgian guns used Plain Twist/Skelp into the early 1900s.

Part of the evolution in pattern welded barrels may have been related to the difficulty in obtaining horseshoe stubs in England, which Greener discussed in 1835 “Making Gun Barrels” p.3

http://books.google.com/books?id=oIEY4qL6_z0C&pg=PA30-IA1&dq

and in 1858, p. 148

http://books.google.com/books?id=A4TPW796iD8C&printsec=toc&dq=w+greener+barrel+pate&source=gbs_summary_r#PPA146,M1

The New American Cyclopaedia: A Popular Dictionary of General Knowledge
George Ripley, Charles Anderson Dana, 1859

<http://books.google.com/books?id=kL9PAAAAMAAJ>

From a very early period the superiority of the metal used for horse-shoe nails was well understood, and the old nails, or stubs, were reserved for the manufacture of gun barrels. They were largely imported into England from the continent; and it was not until the supply was becoming insufficient that such success was attained in the use of other equally good materials...

From *Purdey the Definitive History* by Donald Dallas

James Purdey II in the 1880s - "...weight for weight (Whitworth) steel is stronger than iron and shoots harder, though not of so handsome an appearance as damascus barrels..." He preferred Belgian damascus "...not that when thorough sound English damascus can be obtained they are not superior, but because Belgian workmen are more careful than English, and there is thus less risk of slag and rubbish getting into the welds."

Letters to Young Shooters: (First series) On the choice and use of a gun

Ralph William Frankland-Payne-Gallwey, 1892

There is, however, some little uncertainty about our English Damascus. Really good English Damascus barrels, when they *can* be obtained, are superior to Belgian; but those of English make vary considerably in their excellence. They are also produced in much smaller quantities, and are often difficult to obtain just as required. The Belgian Damascus are more regular as to figure, and more free from 'specks' and 'greys', than are the English, besides being softer, and easier to work. For these reasons many of our gun-makers find it simpler to procure their barrels from Belgium, as there is a very small percentage of inferior quality imported from that country, and as many as wanted can also be easily procured at short notice. As it is the fashion of English sportsmen to imagine that nothing good in the way of guns or barrels can reach us from the Continent, Belgian Damascus, in order to fall in with this popular delusion, is often sold as English. Still, if a gun is fitted with best Damascus, whether of English or foreign make, it is of small consequence to the shooter ; but the fact remains, that **so-called English Damascus is frequently Belgian, and that the Belgian barrels of this manufacture are, generally speaking, more reliable than those made in England.**

The question is frequently raised as to the 'best' or 'highest quality' Damascus. Judging the *attractiveness* of the pattern is entirely subjective, and

a beautiful Six Iron Crolle barrel may not be the strongest. Part of the problem is in the fact that there was no standard by which patterns were named or classified. One maker's 'Boston' may be another maker's 'Oxford' and another's 'Fine Damascus.' There were 20 barrel makers in the *Syndicat des Fabricants de canons de fusils de la Vesdre* in 1907, and most probably made several grades of Two and Three Iron Crolle, 'Boston', and 'Bernard'.

Note all the patterns and grades illustrated on this c. 1900 sales brochure from N.J. Higney, a Nessonvaux barrel maker

<http://www.littlegun.be/arme%20belge/artisans%20identifies%20h/a%20higny%20gb.htm>

U.S. makers provided only a general description of the Damascus offered on various grades.

Parker: The 1899 Catalog lists:

"Fine English Twist" on Quality T, S, R, P & N (and later as an option on VH)

"Fine Laminated Steel" on Quality I & H

"Fine Damascus" on Quality G, F, E, & D

"Fine Bernard" on Quality C

"Extra Fine Damascus" on Quality B

"Finest Damascus" on Quality A

Post-1892 LC Smith:

F grade hammer gun: "English Stub Twist"

Quality No. 0 & 1: "Good Two Rod Damascus"

Quality No. 2, 3, 4 & A1: "Good Four Stripe Chain Damascus"

Quality No. 3, Pigeon, 4 and A1: "Fine Three Rod Damascus"

Quality No. 5: "Very Fine Damascus"

Monogram: "Finest Three Rod Damascus"

A2: "Choice Three Rod Herring Bone Pattern"

It *really* gets complicated with **Remington** which graded the Damascus barrels on Model 1894 guns as follows:

A Grade: "Two stripe Damascus" (Boston)

B Grade: "Three stripe Damascus" (Oxford and Chain J)

C Grade: "Finer Damascus" (Etoile and Washington)

D Grade: "Very fine (Four stripe) Damascus" (Chine and Ohonon)

E Grade: "Finest Damascus" (Peiper and Legia)

The **A.J. Aubrey** shotguns in the 1906 Sears catalog started at \$13.85 and went up to \$69.00 depending on grade and engraving:

Model 18 AS - Laminated (Twist) - \$13.85

20 AT - Armory Steel - \$14.85

22 AD - 2-blade Damascus - \$17.35

30 ALE - Laminated - \$16.35

34 ADE - 2-blade - \$18.85

50 ASE - fine line scroll and game scene Laminated - \$19.35

52 DSE - fine line scroll and game scene 2-blade - \$22.35

56 engraved 3-blade - \$29.75

58 engraved 4-blade - \$39.75

60 made to order 5-blade - \$49.75 (I have never seen a '5-blade' barrel)

62 made to order 6-blade - \$69.00

And of course, marketing played a role in Damascus trade names. These Four Iron Crolle' barrels are on an AA grade Lefever and the rib is marked "***Finest A-1 Quality Silver Steel Damascus High Proof***" Wow!



One way of grading Damascus is by cost

1897 Consular Report: Commerce, Manufactures, Etc, Volume 54

United States Bureau of Foreign Commerce

<http://books.google.com/books?id=SF1IAAAAYAAJ&pg=PA526&lpg>

Price of a **pair** of rough forged tubes

Steel	\$0.58	(3 francs)
Imitation Twist	\$0.656	
Imitation Boston	\$0.77	(4 francs)
Imitation Crolle'	\$0.878	
Twist	\$1.158	(6 francs)
Chainette	\$2.51	
London	\$1.40	
Oxford		
3 Stripe	\$2.90	(15 francs)
4 Stripe	\$3.66	
Boston		
2 Stripe	\$1.93	(10 francs)
3 Stripe	\$2.123	
Extra	\$2.70	
4 Stripe Crolle'	\$4.825	(25 francs)
Damasture' (?Turkish)		
4 Stripe	\$4.312	
6 Stripe	\$5.21	
Washington		
2 Stripe	\$2.123	(11 francs)
3 Stripe	\$2.51	(13 francs)
Etoile'		
2 Stripe	\$2.123	
3 Stripe	\$2.51	

Ferdinand Drissen 1897-1898 price list

The conversion of Belgian francs to U.S. dollars in 1900 was about **5 francs to 1 dollar**. The complete charge for the barrels and gunsmithing for '3 band Crollé' was 80 francs or about \$16. Note three grades of 'Boston' damascus. Barrels 2-6 were each a Twist variant, and obviously much cheaper to produce.

following list shows the prices for smooth-bore barrels of caliber 12, 14, 16 and 20, browned, and fitted to a type of action with locking lever between the hammers, single bolt and rear lockplates. These prices cover cost of the damascus barrel, labor and the gunsmith's profit:

Steel with imitation damascus	28 francs
Ribbon-barrel	38 francs
Birmingham damascus	42 francs
London damascus	47 francs
"Chiné" damascus	49 francs
Bernard ribbon-barrel	50 francs
Boston damascus, four bands, 2nd grade	54 francs
Boston damascus, six bands, 1st grade	59 francs
Washington damascus, 2nd grade	60 francs
Boston damascus, superior grade	63 francs
Washington damascus, 1st grade	64 francs
Chain-pattern damascus	65 francs
Bernard damascus, 3rd grade	66 francs
Bernard damascus, 2nd grade	72 francs
Horse-shoe nail damascus, 2nd grade	76 francs
"Crollé" damascus, 3-band	80 francs
Horse-shoe nail damascus, 1st grade	82 francs
Bernard damascus, 1st grade	84 francs
"Crollé" damascus, 4-band	92 francs
Turkish damascus, 4-band	93 francs
Imitation Léopold Bernard damascus	100 francs
Turkish damascus, 6-band	102 francs
"Crollé" damascus, 6-band	105 francs
"Crollé" damascus, superior grade	115 francs
Bernard damascus II, made by Heuse-Lemoine	130 francs
Bernard damascus I, <i>ditto</i>	140 francs
Turkish damascus, 6-band, <i>ditto</i>	145 francs

"Crollé" damascus, 4-band, 2nd grade, <i>ditto</i>	150 francs
"Crollé" damascus, 4-band, 1st grade, <i>ditto</i>	165 francs
"Crollé" damascus, 6-band, superior grade, <i>ditto</i>	180 francs

In 1900 Jean Lejeune, of Nessonvaux, supplied *Oxford Superfine* at 16 F 50, *Boston* at 10 francs and *Birmingham* at 8 francs. (Plate 4).

M. le chevalier de Hontheim, head of the group comprising the S.A. Armaf, the *Manufacture liègeoise d'armes à feu* and the *Manufacture d'Armes J. B. Rongé fils*, has kindly given us figures from his records. The group's Nessonvaux works produced thousands of damascus barrels of every type, and a ledger for 1903-1904 gives the following cost prices:

One pair of non-twisted damascus barrels	14 francs
One pair of "Crollé" damascus barrels, 3-band	14 frs 50
One pair of "Crollé" damascus barrels, 4-band	22 frs 20
One pair of Boston damascus barrels, 2-band	12 frs 50
One pair of Boston damascus barrels, 3-band	16 francs
One pair of Bernard damascus barrels	16 frs 50
One pair of Oxford damascus barrels, 4-band	23 francs

On 17 July 1914, Arthur Delvaux-Heuse, of Nessonvaux quotes the following prices: *Boston* and *Starred*, 3-band: 12 F 50; the same in single-band: 9 F 75; *Birmingham*: 7 F 65. ■

The most expensive barrels offered by Drissen were *E. Heuse-Lemoine* 1st quality 4-band *Crolle* at 165f and 6-band *Crolle* at 180f (about \$36.)

In 1900, *Jean Lejeune* of Nessonvaux listed the following prices for damascus barrels alone:

“Oxford”-16f 50

“Boston”-10f (about \$2)

“Birmingham”- 8f

In 1914, *Arthur Delvaux-Heuve* of Nessonvaux offered both “3 Band Boston” and “Starred” for 12 francs 50 and “Birmingham” (Twist) for 7f 65.

Another way to judge quality is by strength

The Birmingham Proof House Report of 1891, s published in “The Field” March 7, 1891 Vol 77:325 and reproduced in *Sporting Guns and Gunpowders: Comprising a Selection from Reports of Experiments, and Other Articles Published in the "Field" Newspaper, Relative to Firearms and Explosives* by Frederick Toms, 1897

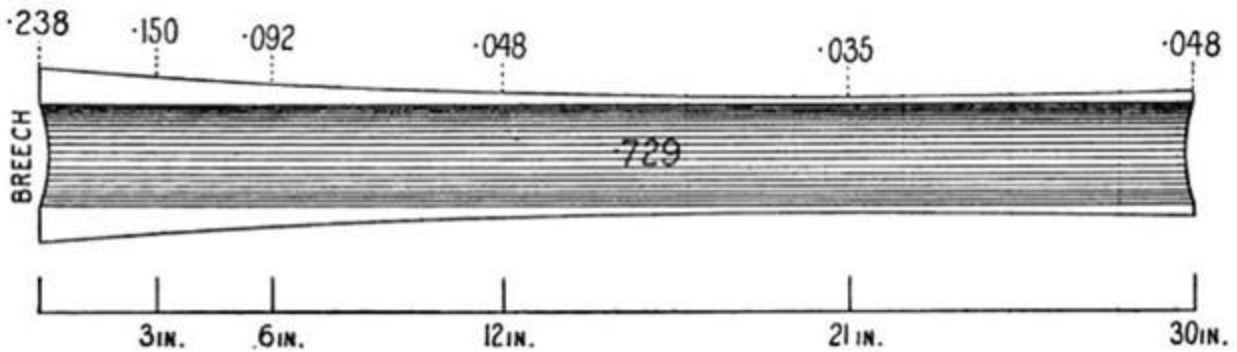
<http://books.google.com/books?id=inQCAAAAYAAJ&pg=PA9>

and *Experts on Guns and Shooting*, G.T. Teasdale-Buckel, 1900

<http://books.google.com/books?id=4xRmHkr7Lp8C&pg=PA538&source>

The report was submitted by Samuel Allport, Chairman of the Guardians of the Birmingham Proof House on Dec. 31, 1890 after testing and two years of meetings of the committee. Other members included C.G. Bonehill, E. James, W.M. Scott, T. Turner Jr., and T.W. Webley.

Three 30” rough bored 12g barrels of **39 different materials** (117 total) were received, and the barrels turned and bored to standard dimensions:



It must be kept in mind that these were specially bored 30" barrels without chambers and with wall thickness of .150" at 3", .092" at 6", .048" at 12" and MWT of .035" at 21".

Barrels were first tested with increasing loads, starting with the **standard Birmingham proof load** of 182 grains/ 6 1/2 drams black powder and 1 2/3 oz. #6 shot. Loads were increased each subsequent shot to the 12th **test load of 358 grain powder with 3 1/4 oz shot.**

Any bulge, which usually occurred 13"- 24" from the breech, was considered failure.

First phase results to a "rejecting bulge"

Barrel cost:

20 shillings = one pound sterling. The pounds sterling - dollar exchange rate in 1880 was 4.84 and in 1900 4.87

TABLE I.—COMPARATIVE RESULTS OF PROVING 19 GROUPS OF DIFFERENT KINDS OF BARRELS
TO A "REJECTING" BULGE AT THE BIRMINGHAM PROOF-HOUSE.

No. in order of merit of endurance.	Register number of group.	Average cumulative grains of powder and shot each barrel endured.	Proportional stress withstood; the actual proof being 1.00.	Ordinary price per pair of rough tubes in shillings.	NATURE OF MATERIAL OF BARRELS TESTED.
1	18	4,248	4.66	28s.	English machine-forged laminated steel, in three rods, improved economic compound coiling process.
2	33	4,227	4.64	90s.	English fluid compressed steel, Whitworth's process.
3	11	3,886	4.26	27s.	English machine-forged best Damascus, in two rods, improved economic compound coiling process.
4	30	3,667	4.02	24s.	English steel, Siemens-Martin process, rolled from a hollow mould; slightly harder than No. 29 group.
5	1	3,355	3.68	35s.	English hand-forged best Damascus, in four rods.
6	14	3,285	3.60	25s.	English machine-forged variegated Damascus, in two rods, improved economic compound coiling process.
7	10	3,443	3.56	29s.	English machine-forged best Damascus, in three rods, improved economic compound coiling process.
8	34	3,142	3.43	24s.	English steel, basic open hearth process, from hematite pig and scrap, carburised by Darby's filtration process.
9	19	3,052	3.35	24s.	English machine-forged laminated steel, in two rods, improved economic compound coiling process.
10	35	3,015	3.31	45s.	English steel, "superior barrel steel."
11	15	2,718	2.98	29s.	English machine-forged chequered Damascus, in three rods, improved economic compound coiling process.
12	39	2,648	2.90	24s.	Foreign steel, Siemens-Martin process.
13	31	2,471	2.70	24s.	English steel, basic open hearth process, from hematite pig and scrap.
14	13	2,441	2.70	29s.	English machine-forged variegated Damascus, in three rods, improved economic compound coiling process.
15	24	2,414	2.65	12s.	English machine-forged skelp twist.
16	2	2,314	2.54	31s.	English hand-forged best Damascus, in three rods.
17	29	2,280	2.50	24s.	English steel, Siemens-Martin process, rolled from a hollow mould.
18	7	2,047	2.25	15s.	Foreign "Pointillé" twist.
19	9	2,016	2.20	31s.	English machine-forged best Damascus, in four rods, improved economic compound coiling process.
20	16	2,010	2.20	25s.	English machine-forged chequered Damascus, in two rods, improved economic compound coiling process.
21	12	1,983	2.11	31s.	English machine-forged chequered Damascus, in four rods, improved economic compound coiling process.

In the **Second phase testing**, the barrels were subjected to increasing loads until bursting, a bulge of .01", or bore enlargement from .729 to .739.

The barrels "in order of merit of endurance" (strength) were judged by the Guardians of the Birmingham Proof House to be:

*** Tied for first place in the second phase destructive testing**

1. English machine-forged 3 rod Laminated steel
2. English fluid compressed steel, Whitworth process

3. English machine-forged 2 rod Best Damascus
4. English steel Siemens - Martin process *
5. English hand forged 4 rod Best Damascus
6. English machine-forged 2 rod variegated Damascus *
7. English machine-forged 3 rod Best Damascus
8. English carburised steel, Darby's method
9. English machine-forged 2 rod Laminated steel
10. English "Superior Barrel Steel" (*process and source not documented*) *
11. English machine-forged chequered 3 rod Damascus *
12. Foreign steel, Siemens - Martin process *
13. English (*open hearth*) steel, hematite process, from pig and scrap
14. English machine-forged variegated 3 rod Damascus
15. English machine-forged skelp twist
16. English hand-forged 3 rod Best Damascus
17. "Hollow mold" English Siemens-Martin
18. Foreign Pointille' Twist (*frequently labeled Belgian Laminated Steel*)

Bottom line: Damascus quality is best judged based on the overall grade/quality of the gun, not the appearance of the Damascus pattern, the name given the barrels by the maker, or the country of origin.

No matter what the rib says



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