

What to do with a Cartridge Case,  
a Bullet, or a Primer



## INTRO

What you do with an object in the field is based on what you know about it. If you know everything you need to know about the object, you don't need to bring it home: just document it and let the future deal with it.

However, there is a second issue: clearly you must bring back a large number of artifacts to pursue related analysis, such as how many users are represented. What is the distribution of cultural modification? Will the collection show personal preferences?

If you recognize firearms material as valuable, you will have to collect it, and do all the research yourself. You can't rely on a firearms expert to give you all the information since they can not put it in context for you.

If you find a: Winchester Repeating Arms Company, Caliber 44 WCF, made from 1873 to 2011, you don't have very much information to work with. This is why many analysis reports only list Cartridge cases and Bullets, depriving the reader of the sometimes rich history of development

and use of a particular cartridge in the local area. If all you are going to do is list the artifact in your analysis, collect the headstamp information and leave it in situ.

## IF YOU WANT MORE INFO

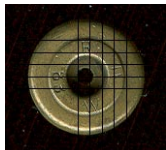
In the following paper I hope to give you some basic tools to use in an analysis of a cartridge, or parts thereof, found in the field. They should provide you enough information to decide if you want, or need, to research further.

A vernier caliper and Barnes's "Cartridges of the World" will give you the identity of the cartridge or cartridge case. Although, even when it's printed on the headstamp you might want to go through the process of measuring and searching "Barnes" to confirm it.

The headstamp is used to tell the user the correct nomenclature of the ammunition. In many cases the headstamp will include the manufacturer's name or symbol. This is important because these are the gateway to more information about expected use and sometimes the date of manufacture. Here it may be appropriate to mention that Barnes doesn't deal with cultural aspects in your local area

The Cannelure is an impressed groove in the neck of the cartridge case used as a physical barrier preventing the bullet from further entry into the case. It may be present in both rimfire and centerfire cases. When cartridges were loaded with black powder the case is full to the base of the bullet and prevents the bullet from receding into the case when used in tubular magazines. When the same cartridge is loaded with the less bulky smokeless powder it does not support the bullet and it needs a firm internal ridge to seat against, to maintain its integrity. This was first noticed in military ammunition about 1903 (Hackley et al 1998:2), but since the military used to be always behind the current civilian technology, it was probably in use a few years earlier. The presence or absence of a cannellure determines if the original loading was black or smokeless on cartridges that were originally developed as a black powder cartridge.

If you have a small collection of cartridge cases of the same caliber, you may want to look at the firing pin impressions. These can tell the minimum number of firearms that were present at the site, but not when.



Do your measurements on a flatbed scanner. Use of Photoshop and its measurement grid will allow you to take exact measurements of any feature you can see.

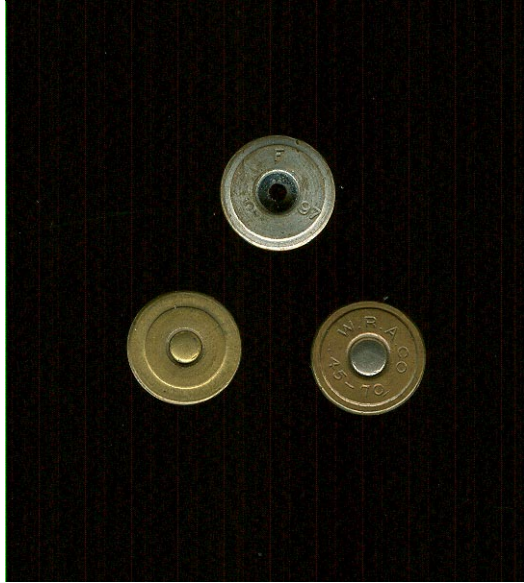


## RIMFIRE

The first thing to look for with a rimfire cartridge is: case material. The original material used was copper and was in use from 1856 to roughly 1928-40. The switch to brass was occasioned by the introduction of the hi-speed loadings which were too high pressure for the older copper case. This occurred in the late 20's ( Barber 1987:169) and was well established by 1931 (Landis 1999:22). However, standard speed loadings continued to be manufactured in copper cases by most manufacturers until the beginning of WW-2. Copper didn't survive the war.

Headstamps for rimfire cartridges are prolific to say the least. The best reference is Kass "Rimfire Headstamps" , next is Barber and Suydam. The latter two include manufacturers reference material and bullet styles.

Case mouth codes are impressed letters seen in the case material at the mouth of the case on some copper rimfire ammunition. They were used to denote special powder and primer loadings. The only published reference I have is Barber ( Barber 1987: appendix F), however there is more information in the International Ammunition Association( IAA) journals.



## CENTERFIRE

Not all centerfire ammunition had headstamps. Headstamps didn't come into general use until Winchester started, as illustrated in their 1886 catalog (Shuey 2000:162). However, that fact is not a good indication of the date of manufacture. The lack of a headstamp can indicate early manufacture or it might also indicate military use or special bulk orders.

Normally, you can reasonably expect to find the manufacturer and the caliber designation on the headstamp of a centerfire cartridge. However, military cartridges may only be an abbreviation and a date of manufacture.

Most of the cartridge introduction dates are not hard to find. Barnes gives them and there is a list in the "Winchester Book" by Madis, also there is a list attached to the Remington/UMC paper by Dick Fraser in his IAA journal article (Fraser 1996:21).

Chapter 5 The Cartridges and Headstamps



From 1895 to 1897 the cartridges were headstamped S.A.R.Co. Note that the .303 was not referred to as the .303 Savage at that time.



It is not known which came first the "S" primer or the "bump" primer but both of these rounds show the 1897 to 1916 "S.A.Co." headstamp



The "S.A.CORP." Headstamp used starting in 1917.



The simplified "S A CORP" headstamp used on cartridges added to the line after 1940. Some existing calibers changed to this headstamp over the years. See chapter 4 for lists.



Some calibers used the "SAVAGE" headstamp throughout manufacture. Some used it from the 1950s on. See chapter 4 for a calibers and years.

You should be aware that the manufacturer is not always the same as the headstamp. For instance: Savage arms started out contracting the manufacture of their ammunition to the United Metallic Cartridge Company (UMC) in 1895. After 1899 Savage would not join the coalition of ammunition manufacturers, and they were forced to manufacture its own ammunition. Starting in 1928 they again were able to contract for production, this time with the United States Cartridge Company (USCC). Then in 1935 they contracted with Remington Arms Co. until 1963, at which time they ceased marketing ammunition (Zimmerman 2002:20). The point is that all of the different manufacturers headstamped the cartridge cases with a Savage brand headstamp, but all were of a different design.

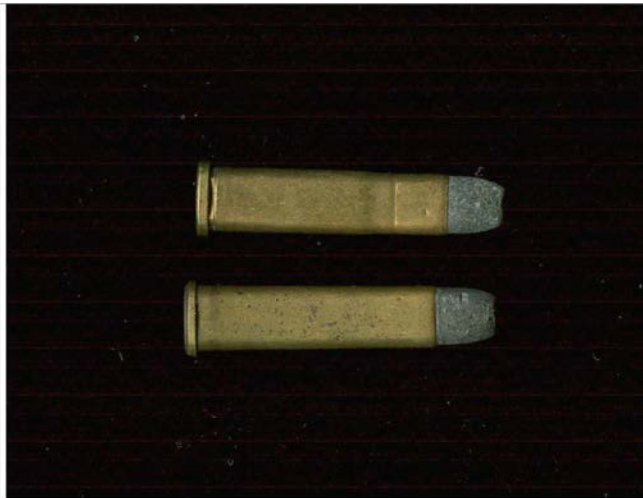
Probably the most common headstamps you will find are from Winchester and Remington/UMC (United Metallic Cartridge Company). They were the big producers and have the best developed histories.



Winchester began with the "W.R.A.Co" headstamp and used it until 1928 when the first cases are noted with the "W.R.A." headstamp (Shuey 2000:162). The transition lasted about 10 years or until all the old stock was used, more popular calibers being replaced first. The best reference for the W.R.A.Co. headstamp is Daniel Shuey's work which shows not only all the headstamps but also the loadings, bullets and primers used. After the W.R.A.Co. headstamp came the "WRA" headstamp closely associated with the Olin Industries assumption of ownership in 1931 ( Shuey 2999:11). Then in 1979 Winchester changed again, this time to the "WW" headstamp we see today (Chris Punnett Personal communication).



Remington has a different story. They were in the habit of using the UMC brand ammunition for all their metallic cartridge work. However in 1912 Remington and UMC merged and the headstamp reflects this: "REM/UMC". As with Winchester the transition took place over several years but one must remember that there was no Remington brand metallic ammunition before 1912, only shotshell cartridges. The "REM/UMC" headstamp changed in 1960 to the common "R-P" seen today. The best reference on Remington is an article by Dick Fraser in the International Ammunition Association Journal. It covers not only dates (both introduction and end of manufacture) but the size and shape of headstamp characters as well as the design.



There is one feature of a center fire case that is a milestone. The rim of a centerfire case will have a turned cut at the junction of the rim and the case body after 1907. This was the result of a change in manufacturing technique and is documented in The History of US Small Arms Ammunition (Hackley et. al. 1998:2)



## PRIMERS

Primers of centerfire cartridges come in many sizes, forms and styles. They can be flat, (current style) domed, (pre WW2), copper (black powder), Brass or nickel plated, and monogrammed. The changes follow the advent of smokeless powders and the technical evolution to the current non-mercuric, non-chlorate, non- corrosive primers of today.





Monograms were a way of identifying primers that were intended for smokeless powders, in the late 1890's to 1923. The most complete information today is Daniel Shuey's work on Winchester ammunition which lists and describes Winchester's primers from the black powder era to the advent of the noncorrosive type in 1952 (Shuey 1999:22). Other than that, Philip Sharpe published the "Complete Guide to Handloading" and this very large book has a good section on primers and their history up to 1937. ( Sharpe 1949: 48-65)



## BULLETS

Originally all bullets were lead or an alloy of lead/tin/antimony. A natural outgrowth of the practice of patching the bullet with paper to protect the bore from lead smears was to patch the bullet with metal. At first the most common metal to use was German Silver or copper with a tin coating. This proved unsatisfactory because it needed additional lubrication. The answer was forth coming in the form of "Lubaloy", an alloy of copper brought out by Western Cartridge Company in 1922 (Hatcher 1966:343). This was the end of the silver colored bullets. For a complete history of lead and metal patched bullets see Sharpe's "Complete Guide To Handloading" (Sharpe 1949;95-127).

While we are on the subject, soft nose metal patched bullets were unknown before their invention in the late 1890's, by workers at "Dum Dum" arsenal in India.



## SHOTSHELLS

Probably the most concentrated collection of shotshell information is in the Standard Catalog of Winchester. Unfortunately it is only Winchester information. The United Metallic Cartridge Company was the direct challenger to Winchester's supremacy in the American ammunition market. However, we have no published works other than old catalogs to reference their production and they merged with Remington in 1912.

Winchester shells are, however, fairly well documented because of their collector value. The "Standard Catalog of Winchester" has a large section dealing with early production and some of the sections are very noteworthy.

For example:

In 1901 Winchester introduced their "1901" headstamped shotshell. With improved construction to withstand the rigors of smokeless powders, it had enough strength to withstand most of the problems created by handloaders who did not understand the difference between black and smokeless powders. This fine shell was discontinued in 1919 (Shuey 2000:188).

About 1924 was the year that the government required the "made in USA" label to be on shotshells as a result of the export laws. (Shuey 2000:188)

And last, there is the Winchester "Repeater" shell. Introduced in 1896 with its distinctive yellow hull, it survived virtually unchanged until 1932 when the hull color was changed to red. The "Repeater" was dropped from the Winchester line in 1938 (Shuey 2000:187).

Additionally, here is a chart I compiled from a publication of original Winchester Catalogs. The title is : "Catalogues W.R.A.CO.", there are 12 volumes, and they were published by Armory Publications. The chart is a listing of all shotshells offered by Winchester, by date, and by trade name. Sorry there isn't more, but it's all I had.

	Winchester 1st Quality	W.R.A.Co. STAR	W.R.A.Co. SC (2nd Quality)	W.R.A.Co. RIVAL	W.R.A.Co. Blue RIVAL	Winchester Leader	Winchester metal Lined	Winchester Repeater	Winchester New Rival	Winchester Pegion	Winchester Yellow Rival	Winchester Nublack loaded		Winchester Brass	W.R.A.Co. RIVAL - BRASS		
1884	X	X	X	X										X			
1885	X	X	X	X										X			
1886	X	X	X	X										X			
1887	X	X		X										X			
1888														X			
1889														X			
1890	X	X		X										X			
1891														X			
1892	X	X		X										X	X		
1893	X	X		X										X	X		
1894	X			X	X	X	X							X	X		
1895	X			X	X	X	X							X	X		
1896	X			X	X	X	X	X						X	X		
1897	X				X	X	X	X	X					X	X		
1898					X	X	X	X	X	X				X	X		
1899					X	X	X	X	X	X	X			X	X		
1900					X	X	X	X	X	X	X			X	X		
1901					X	X	X	X	X	X	X			X	X		
1902					X	X	X	X	X	X	X			X	X		
1903					X 1901	X 1901	X 1901	X 1901	X 1901	X 1901	X			X	X		
1904						X 1901	X 1901	X 1901	X 1901	X 1901				X	X		
1905						X 1901	X 1901	X 1901	X 1901	X 1901		X		X	X		
1906																	
1907						X 1901		X 1901	X 1901			X		X	X		
1908						X 1901		X 1901	X 1901			X		X	X		
1909						X 1901		X 1901	X 1901			X		X	X		
1910						X 1901		X 1901	X 1901			X		X	X		
1911						X 1901		X 1901	X 1901			X		X	X		
1912																	
1913																	
1914						X 1901		X 1901	X 1901			X		X	X		
1915																	
1916						X 1901		X 1901	X 1901			X		X	X		
1917																	
1918						X 1901		X 1901	X 1901			X		X	X		
1919																	

No Catalog on hand at this time to continue the chart.

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