

# A Numismatic Recipe

*Coins usually are forged of materials more resilient  
than snips and snails and puppy-dog tails.*

THE METALS used in American coins always have reflected considerations of cost, convenience, tradition and technology.

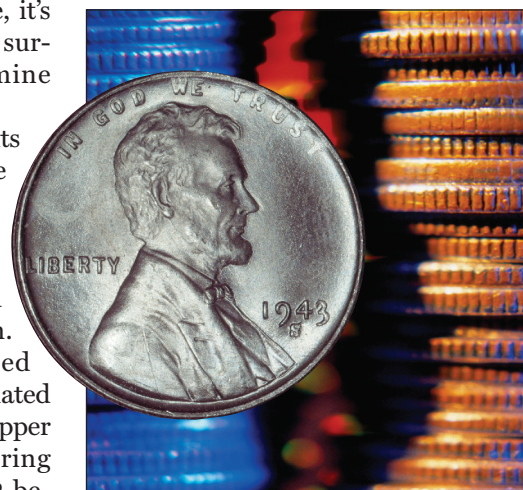
At one time, gold and silver vied for supremacy in circulation, but today new materials jingle in American pockets and purses. Our current circulating coins use four very different combinations of metals, and only one has the same composition it had 50 years ago. Because metals are so fundamentally important for coinage, it's worth taking a look beneath the surface of American coins to examine their composition.

Today's cent appears similar to its predecessors, but the resemblance is only skin deep. From 1864 to 1942, and again from 1944 to 1982, cents were bronze, an alloy containing 95-percent copper and varying amounts of zinc and tin. This composition was abandoned temporarily in 1943, when zinc-plated steel was employed to conserve copper for the war effort. A more enduring change was implemented in 1982 because of rising copper costs. Today's copper-coated zinc cents are outwardly similar to the bronze pieces, but about 20-percent lighter.

The 5-cent piece stands out as a model of metallic stability. Current specimens have the same weight and composition as the original 1866 issue, with an alloy of 75-percent copper and 25-percent nickel. The only deviation occurred during World War II (1942-45), when copper, silver and manganese were employed to conserve nickel. It's interesting that the 5-cent piece is called a "nickel" and has a grayish color, even though its alloy contains

three times more copper than nickel.

Today's dime, quarter and half dollar also are composed of copper and nickel, although the recipe is more complicated than a typical alloy. Each coin has a copper core sandwiched between layers of copper-nickel. Look closely, and you can see the distinctive layers on the coins' edges. This "clad" composition was developed in the 1960s, when the rising price of silver forced the U.S. Mint to develop an alternative coinage material. Clad coins resembled existing 90-percent silver pieces and matched their electro-



▲ Zinc-plated steel cents were struck to conserve copper for the war effort.

magnetic properties for acceptability in coin-operated machines. Clad dimes and quarters were introduced in 1965, with half dollars following in 1971.

The Sacagawea dollar is made from an even more elaborate mix of metals. Its innermost layer is pure copper, while its outer layers are predominantly copper, along with zinc, manganese and nickel. The coin's metallic composition matches the electromagnetic properties of the clad Anthony dollar, and its golden color dis-

tinguishes it from the quarter. Though it appears similar to the gold coins that flowed from America's mints until 1933, the coin does not contain any of that precious metal.

For all these current coins, and those of earlier eras, choice of metal content has significantly affected coin manufacture and circulation. Silver and gold are soft and pliable, so most American precious-metal coins have been alloyed with small amounts of copper to improve their durability in circulation. At the other extreme, alloys containing nickel tend to wear slowly, but the metal's hardness strains the dies used for striking coins.

Metals also have aesthetic properties that are relevant to coin collectors. Copper or bronze coins have a bright, orange-red glow when first minted, but they typically darken to a chocolate brown over time. Many collectors prize earlier pieces with some or all of their original red coloring. Coins often are described as "red," "red-brown" or "brown," depending on their surface colors.

Silver coins can be dramatically affected by storage conditions and often display attractive coloration. These "toned" specimens can bring premiums over untuned, "white" pieces. Other materials have issues of their own: zinc-plated-steel cents and early copper-coated-zinc cents can show signs of corrosion, while alloys containing manganese tend to darken over time. By contrast, nickel and (especially) gold generally resist discoloration.

As this overview indicates, American coins contain an eclectic mix of metals with very different properties and histories. Knowing what your coins are made of will help you appreciate their evolution and beauty.

*sanders@money.org*

CENT PHOTO: ANA MUSEUM/JOHN NEBEL