

**½E, 1E, 2E, 4E, 8E** - the method by which the denomination is denoted on the coin itself: ½E (*medio-escudo* or half Escudo), 1E (*escudo* or 1 Escudo), 2E (*dos escudos* or two escudos), 4E (*cuatro escudos* or 4 Escudos) and 8E (*ocho escudos* or 8 Escudos) 1 Escudo equaled 16 *reales* (silver) or 2 *pesos* (silver).

**½E** - a gold alloy (0.875 gold, 0.125 copper) coin of one-half *escudo* denomination, it features the national emblem with the facing eagle on one side and the book of law and hand holding a staff with the liberty cap on the other. It was produced from 1825 to 1870. The coin is nominally 15mm in diameter and weighs 1.692 grams. It has oblique reeding on the edge. and is of equal value to eight *reales*. (*see also peso de oro*).

**1E** - a standard purity (0.875) gold coin of one *escudo* denomination. It has the usual book of law and national emblem style with an obliquely reeded edge. The coin is nominally 18mm in diameter and weighs 3.384 grams. It is of two *pesos* or 16 *reales* in value.

**2E** - a standard purity (0.875) gold coin of two *escudos* denomination produced between 1825 and 1870. The style is the same as other *escudo* coinage. The coin is nominally 23mm and weighs 6.768 grams. The edge is obliquely reeded. The *dos escudos* was not produced with any real regularity and usually in small quantities.

**4E** - a standard purity (0.875) gold coin of four *escudos* denomination. The style was the standard of the *escudo* coinage. The denomination was not popular, and other than by the mint at Guanajuato, the *cuatro escudos* was seldom produced. The coin is nominally 30mm in diameter and weighs 13.536 grams. It was the equivalent of eight *pesos* in silver.

**8E** - a standard purity (0.875) gold coin of eight *escudos* denomination. Only this highest of the gold series was produced in 1823 with the profile eagle style. It was struck from 1824 to 1873 with the facing eagle. All have the hand on book with staff and liberty cap. The coin is nominally 37mm in diameter and weighs 27.073 grams. The edge is obliquely reeded. This highest value gold coin saw the greatest production and is the most commonly available. It is equal in value to sixteen *pesos*. [B&H]

**½R, 1R, 2R, 4R, 8R** - the method by which the denomination is denoted on the coin itself: ½R (*medio-real* or half Real), 1R (*real* or 1 *Real*), 2R (*dos reales* or 2 *Reales*), 4R (*cuatro reales* or 4 *Reales*) and 8R (*ocho reales* or 8 *Reales*) 8 *Reales* equaled 1 *Peso* (silver) or ½ *Escudo* (gold).

**½R** - a silver alloy (0.9027) coin of one-half *real* denomination, it exists both in the profile (1824) and facing eagle styles (1825-1870). All have the cap and rays design on the opposite side. The coin is nominally 16mm in diameter and weighs 1.69 grams (*see also medio*).

**1R** - a silver alloy coin of one *real* denomination, it exists both in the profile (Durango, 1824) and facing eagle styles (1825-1869). All have the cap and rays design on the opposite side. The coin is nominally 20mm in diameter and weighs 3.384 grams.

**2R** - a silver alloy coin of two *reales* denomination, it exists both in the profile (1824) and facing eagle styles (1825-1872). All have the cap and rays design on the opposite side. The coin is nominally 27mm in diameter and weighs 6.767 grams (*see also peseta*).

**4R** - a silver alloy coin of four *reales* denomination, it exists only in the facing eagle style (1827-1870). All have the cap and rays on the opposite side. The coin is nominally 32mm in diameter and weighs 13.536 grams (*see also tostón*).

**8R** - a silver alloy coin of eight reales denomination, it exists both in the profile (1823-1825) and facing eagle styles (1824-1897). The standard diameter is 39mm and the legally defined weight is 27.073 grams. (*see also peso and onza*).

**10D<sup>S</sup> 20G<sup>S</sup>** - Ten *Dineros* (*diez dineros*) Twenty *Granos* (*veinte granos*) denoting the fineness of silver in a *Real* coin of the Republic of Mexico. The *Real* System determined that pure silver was 12 *Dineros* and each *Dinero* was capable of being divided into 24 *Granos*. Therefore, the decimal equivalent would be  $10/12 + 20/24$  of another 12<sup>th</sup> (mathematically that calculated to 260 divided by 288 = 0.9027777). The number was rounded to 90.27% by the mints and later by collectors (*see also ley*).

**11D<sup>S</sup> 4G<sup>S</sup>** - *Once dineros y cuatro granos* denoted an obsolete Spanish standard for silver equivalent to 0.925 purity. It was used for coinage in the 18<sup>th</sup> century.

**21Q<sup>S</sup>** – Twenty One *quilates* (21 carats) denoting the fineness of gold in an Escudo Coin. The Escudo System determined that pure gold was 24 *quilates* therefore, 21 Q<sup>S</sup> would be a Fineness of 87.5% gold (21 divided by 24 = 0.875).

**2R<sup>S</sup>, 4R<sup>S</sup>, 8R<sup>S</sup>** – indicates the denomination 2 *Reales*, 4 *Reales* and 8 *Reales* respectively, found on some coins struck in San Luis Potosi in the 1830s.

**Academia San Carlos** - in 1776, Spanish royal authorities sent Gerónimo Antonio Gil to Mexico as Chief Engraver for the mint. On November 4, 1781, he founded the *Academia San Carlos* school of engraving. It was the first major art institution in the Western Hemisphere. Many of its graduates were employed in the mint in Mexico City, and later in other state mints. In addition to teaching at the academy, Gerónimo Gil continued in his position as Chief Engraver until his death in 1798. After independence, the school was renamed the *Academia Nacional de San Carlos de México* (1821). Its directors in the days of the early republic were José María Montes de Oca and Pedro Patiño Ixtolinque. It remains one of the premier graduate art institutes of the Americas.

**acorn (*bellota de roble*)** - the seed of the oak tree within a rough husk or cap. In heraldry, the oak symbolizes strength and its fruit, the acorns, fertility and fecundity.

**acuñación** - coin or coinage (also *acuñamiento*).

**adjustment marks (*huellas de ajuste*)** - a term used to describe the relatively uniform striations – caused by a process at the mint – found on some coins. Exactly how or what formed the striations is still undetermined. Traditionally it was thought the striations were caused by a mint worker wielding a file to remove some of the silver because the coin was overweight, i.e., not within the tolerance for the weight standard. However, a good number of serious collectors and dealers have opined that such marks are too uniform and too light to have been made by a file in the hand of an individual mint worker while holding the coin/planchet in the other hand (or perhaps in a jig). However, sometimes we do see lines that intersect and/or overlap in crisscross

patterns. Those almost certainly were caused by a file. Therefore, adjustment marks can be from a file or striations that result from plates (silver or gold) that were formed with rollers that had foreign matter on them. Others have pointed out that “adjustment marks” are found on coins as small as the ½R and the 5 centavos and it is unlikely that any mint would go to that amount of trouble to “file down” coins so small. A fellow numismatist/dealer, who is also a jeweler, noticed that the light striation marks sometimes appeared on plates he was rolling to make jewelry. He found that the rollers had foreign matter on them and the metal plates subsequently exhibited straight parallel striations caused by the contamination on the rollers as the silver or gold passed through them. Many collectors have several *Real* minors and crowns that are considerably overweight but exhibit no adjustment marks as well as some that have adjustment marks and are still overweight. Thus when examining coins we need to look for the difference between parallel and non-parallel striations. We acknowledge Rod Bates for this alternative explanation. Others, using different reasoning, have come to a similar conclusion. [DB]

**águila(s)** - the term used for the eagle in the national emblem or coat of arms. It was present in the Aztec legend of the founding of *Tenochtitlan* or Mexico City. The eagle in question was identified by ornithologist Martín del Campo from ancient manuscripts as the *caracara* or *quebrantahuesos* (taxonomically a falcon), but for official purposes the bird is the *Águila real*, the golden eagle or royal eagle.

**adarme(s), A<sup>S</sup>** - a measure of precious metal weight equal to  $\frac{1}{16}$  of an *onza*. The *adarme* is  $\frac{1}{2}$  *ochava* and is equal to 36 *granos*. It weighs 10.152 grams.

**Alamán, Lucas** - (1792-1853) a noted Mexican historian and conservative political figure, Alemán was born in the city of Guanajuato. He left following the occupation of the city by the forces of Hidalgo (1810) and traveled and studied in Europe. While in London, he successfully promoted developing the mining and minting industries in Mexico (1822-1826). Along with the British diplomat and writer H. G. Ward<sup>qv</sup>, (author of *Mexico in 1827*), he was instrumental in making investments in the neglected mines and mints popular in Europe. Alemán was later president of the directors of the United Mexican Mining Co., the British firm that operated Guanajuato's famous *Rayas* mine. He was the co-founder of the Mexican Conservative Party. Among many writings, his most influential publication was his five volume *Disertaciones sobre la Historia de Mejico* (1849-1852).

**Anglo-Mexican Mint Association** - (*see Compañía Anglo-Mexicana*).

**annealed (recocido)** - the process of heating alloys such as steel or precious metals to incandescence and allowing them to cool slowly, thus relieving internal stresses and making the materials softer. This is a key step in both producing tools and dies and in treating plates of alloy for coins between separate rolling processes. If improperly annealed, the planchets produced often crack or can cause excessive wear to dies.

**arroba(s)** - a measure of dry weight equal to a bushel, or roughly 25 pounds or 11.3 kg. Twelve *arrobas* were equal to one *carga*. (*see also Weights and Measures*).

**assayer (ensayador)** - a mint official, employed by the state or federal government, who assayed or certified the assay of the precious metal content and

weight of coins produced by a mint. In actual practice, each mint had at least two assayers, one appointed by the state or federal authorities whose initials appeared on coinage, and another employed by the mint operators. Larger mints often had two state appointed assayers (*see also mint*) [HNM2]

**assayer's initials (*iniciales del ensayador, marca de ensayador o sigla de ensayador*)** - Law required assayer or assayers initials to appear on the coins whose alloy and weight they certified. In some cases the initials may be those of one person, in other cases they may represent the initials of the first or last names of two assayers acting jointly. This practice of having two assayers was almost always the case at the larger mints such as Guanajuato, Mexico and Zacatecas. [HNM2][RDS][EB]

**Boulton, Watt & Co.** - (1799-1850) a firm founded by the pioneer of the industrial mint, Matthew Boulton, and the inventor who perfected the steam engine, James Watt. Its facilities were located in Soho, a suburb of Birmingham, England, and for that reason, many refer to the company as the Soho Mint. The portion of the firm's history pertaining to the mints of *Republica Mexicana* came long after the death of Matthew Boulton (1809) during a period when the leadership of the company had passed to his son, Matthew Robinson Boulton. The firm had business relations or provided tools, dies, presses and other equipment to five of Mexico's mints between 1825 and 1848. They were Mexico City, Chihuahua, Culiacán, Guanajuato, and Zacatecas. At the time Boulton, Watt & Co. was dealing with the mints, all but Mexico City were under the control of British investment groups, corporations or individuals. As Richard Doty points out in *The Soho Mint & the Industrialization of*

*Money*, due to Mexico's infrastructure, politics or economy, none of the mints ever achieved the level of efficiency or modernization that Boulton, Watt could have made possible, but that all, to some extent or another, improved coinage and processes with steel, tools, equipment or dies manufactured by the Soho Mint. [Doty][HNM2]

**Bras-de-Fer, Manuel** - a French citizen, who along with José Antonio Pescador, leased the mint at Durango for a term of fifteen years in November 1829. In addition to modernizing processes and equipment at the mint, Bras-de-Fer probably introduced hubs or dies of a French pattern in 1831. This would have been the same year that a British firm in Guanajuato began illegally importing finished dies produced by Boulton, Watt & Co.<sup>9v</sup> for eight *reales* coins. Bras-de-Fer is also credited with being the first in northern Mexico to separate gold from silver ore, a process that was very profitable to the mine owners of the region, and which had previously only been possible at the mint of México. Bras-de-Fer, in partnership with Julio Lehman, also purchased the rights to the largest iron foundry in Durango in July 1840. He died shortly thereafter. [A.de Letinez, II, 113][D-P][HNM2]

**brass (*latón*)** - a metallic alloy of copper and tin used for minor coinage of low value. Brass is also sometimes used for pattern strikes or trial strikes of dies (*see also pattern*).

**brilliant** - (*see resplandores*)

**brillo** - a term for lustrous or shiny, usually meaning that a coin has mint luster (*brillo original*), as opposed to shiny from cleaning. The term is not the equivalent of brilliant uncirculated.

**British die style** - (*see Soho and Sonora die styles*).

**British Mining Company** - a joint stock corporation chartered in London. The firm obtained a ten year lease on the mint at Guadalajara (*Estado de Jalisco*) on March 2, 1825. The lease was granted by the state to the agents for the corporation, Richard Ester and Archibald T. Ritchie. The stipulations in the lease are unusually detailed and give specifications for duties of employees and a summary of technical operations that provides a wealth of detail for researchers. There can be little doubt that the detailed procedures were provided by the Mexico City mint to the legislature. The terms of the lease were published by the state congress April 28, 1826. They are reproduced verbatim in Pradeau's *Historia Numismatica de Mexico 1823-1950*, III, 15-27.

**bronze (*bronce*)** - a metallic alloy of copper and zinc used for minor coinage of low value. Such coinage lacked any intrinsic value, and citizens sometimes refused to accept payment in copper or copper alloy coins especially when counterfeiting was widespread. [HNM2]

**cactus** - (*see nopal*).

**carga(s)** - a measure of dry weight equal to 300 pounds or 136 kg. The *carga* was divided into twelve *arrobas*. (*see also Weights and Measures*)

**casa de moneda** - a mint, or the building(s) of a mint. During the early Republic period, states were authorized to coin money and operate their own mints. At various times, thirteen state mints produced coinage as well as the federal mint in Mexico City.

**castellano(s), C<sup>S</sup>** - a weight equal to 1/50<sup>th</sup> of a gold mark having 4,800 *granos*. One *castellano* is equal to 96 G<sup>S</sup>. Although technically obsolete after 1731, the term was still used in legal and other documents. (*see also peso de oro*)

**ceca** - a mint, (arch. *zeca*) also used as a term for a mintmark (*see also casa de moneda*).

**cacharpas** - a term for privately issued tradesman's tokens. [HNM2]

**clashed dies (*chocar de troqueles*)** - (*see die defects*).

**cleaned coins (*monedas limpiadas*)** - many coins of this period have been damaged by cleaning. There are probably only two cases where cleaning is justified, those being coins recovered from seawater that are encrusted with corals or other marine deposits, and those dug that are covered with oxides, soils or organic material. Detrimental cleaning is often done with abrasive compounds or wire brushes that cover the surface with scratches or parallel hairlines. Other common methods are boiling in vinegar (acetic acid) or treating with proprietary cleaners, dips and solvents that often contain hydrochloric acid (HCl), sulfamic acid (CS(NH<sub>2</sub>)<sub>2</sub>), or thiourea and detergents. All so-called dips or cleaners contain either a dilute acid that corrodes the surface of coins or an abrasive that scratches away the surface along with patina or encrustations. Acids generally react with the copper in gold and silver alloys and dissolve it from the surface, leaving the coin with an unusual color. In most cases, coins should not be cleaned, and those that have been should be identified as such and graded accordingly. One should avoid cleaning coins unless they have some type of problem, such as active corrosion that is damaging the coin, and/or it is so soiled or encrusted that proper attribution is

not possible. Recently a possible problem has been identified involving the contamination of coins stored in soft plastic envelopes that contain polyvinyl chloride (PVC). Some recommend cleaning with a solvent such as acetone. Since PVC is a usually inert compound approved for use in drinking water systems, this theory is not universally accepted.

**cobre** - (*see copper*).

**coin axis, alignment (eje de moneda)** - each side of a coin is so situated that when the top of the side facing the holder is rotated 180° (along a horizontal axis) away from the holder the opposite side will be properly oriented.

**Colonial edge (canto colonial de española)** - during the later Spanish colonial period in Mexico the edges of precious metal coins were ornamented with patterns consisting of circles and rectangles or patterns of laurel leaves on silver coins and oblique reeding on gold, among others. The edge ornamentation was an effort to prevent counterfeiting. It was introduced in Mexico between 1732 and 1734 and was applied prior to striking the coin in the dies. [HOH]

**Compañía Anglo-Mexicana** - also known as the Anglo Mexican Mint Association, it was a joint stock firm organized in London in 1824. It successfully solicited the lease on the mint of Guanajuato May 31, 1825. At various times, controlling interest in the company belonged to Manning & Marshall Co.<sup>qv</sup> or financier Ewen Clark Mackintosh<sup>qv</sup>. At the time the lease was renegotiated in 1842, the firm was known as *Compañía Mexicana de Casas de Monedas*. That firm controlled leases at both Guanajuato and Zacatecas. The preference granted to the British company by the State of Guanajuato, and later the federal treasury, had more to do

with large loans made to the government rather than the efficiency of minting operations. [Blanco][Doty][D-P][HNM2]

**Compañía Limitada Central de Casas de Moneda de México** - a corporation founded by Sebastián Camacho and Robert Symon<sup>qv</sup>. In 1880 the firm successfully lobbied the government for the leases on the mints of Guadalajara and Durango, having already consolidated the contracts for Alamos, Culiacán and Hermosillo. In return for large loans to the federal government, the firm received very favorable treatment including reimbursal for all capital improvements in equipment and facilities. The management of the remaining mints reverted to the government in 1895. [HNM2]

**Compañía Minera de Guadalupe y Calvo** - also known as Mackintosh & Co., was granted rights to operate a second mint near mines in the southern part of the State of Chihuahua, allegedly due to bribes or loans to Pres. Antonio López de Santa Anna. The mint was the first in the nation to employ steam powered coin presses December 1, 1847. The Guadalupe y Calvo mint proved to be financially untenable, and operated only from 1844-1852. [D-P]

**copper (cobre)** - a metallic, highly ductile and malleable element (Cu) having a reddish color. Unalloyed copper was sometimes used for low denomination coins despite the fact that it is relatively soft and unlikely to withstand heavy circulation.

**copper coins (monedas de cobre)** - for the first two decades of the Republic, many states used their coinage authority to produce large issues of copper and copper alloy minor coins. Since such coins had almost no intrinsic value, they produced large profits for the states. Counterfeiters compounded the problem by adding to the

numbers of already inflated minor coins. Citizens had a well-founded mistrust of copper minors, and did not accept them willingly.

**counterfeit coins (*monedas falsas*)** - (a short essay is being developed).

**cuartillo(as),  $\frac{1}{4}$ R, 4<sup>0</sup> - 1** a coin valued at  $\frac{1}{4}$  *real*, usually of copper or copper alloyed with tin or zinc and generally about the size of the two *reales* or 27mm in diameter.

*Cuartillas* (obs. *quartillas*) were issued by many states as well as the federal government. In 1842 all existing base metal *cuartillas* were either redeemed or devalued and removed from circulation and were replaced. **2)** a small 12mm diameter silver coin of  $\frac{1}{4}$  *real* denomination issued between 1842 and 1863 as a result of a law passed by Congress February 18, 1842. The coin was of standard silver purity and weighed 0.846 grams. The  $\frac{1}{4}$  *real* had the head of Liberty facing left on one side and the fraction  $\frac{1}{4}$  surrounded by the legend REPUBLICA MEXICANA and the date on the other. The issue is unusual in that most of the coins have the initials L.R. (Luciano Rovira, an engraver at the Mexico City mint) rather than those of the local assayer(s).

[HNM1][HNM2][B&H]

**cuartos** - very small Spanish colonial silver coins, also a term later used indiscriminately for any coin valued at  $\frac{1}{4}$  *real* (see *cuartillo*).

**decimal coinage** - a standardized, logical system of denominations based on multiples of ten. Attempts to introduce the system were begun as early as 1841 when the mint at Mexico City produced a 1 *centavo* pattern and actual *un centavo* pieces were struck at the Mexico City and San Luis Potosi Mints in 1863. During the French-dominated administration of the Emperor Maximilian all *IMPERIO MEXICANO* issues were based on

the unit of the *centavo*, where one *peso* = 100 *centavos*.

**DMDA** - an abbreviation for nomenclature found on republican *real* (silver Cap & Rays) and *escudo* coinage. It stands for denomination, mint, date and assayer. In Spanish the abbreviation would be *VCFE*, for valor, ceca (o casa de moneda), fecha y ensayador. In this standard format, a coin should be described in text as the data is presented in the legend: 2R H<sup>0</sup> 1861 FM.

**Decree of August 1, 1823 (*El Decreto de 1 Agosto de 1823 que Autoriza la Producción de la Moneda*)** - The legal foundation for all Republic of Mexico gold, silver and copper coinage. It established the cap and rays as the style for silver coinage and the hand on book for gold. It also introduced the national emblem. The decree assured the public that the purity of silver and gold coins would remain the same as those of the Spanish colonial government. [HOH]

**denomination (*valor*)** - the stated value of a coin, either within the legend or included in the design. Denominations would include terms such as *reales*, *pesos*, dollars, pounds, pence, *francs*, etc. [TR]

**denticles (*dentadas*)** - raised tooth like projections extending inward toward the center from the outer rim of the coin. During the Republic Era they were sometimes used to compensate for the lack of a collar when the coin was struck. [DB]

**design (*diseño*)** - the graphic concept, idea or representation of, in this context, a numismatic item such as a coin, token or medal. Once the design is engraved on dies or a metal blank it becomes a proof or a finished production item. Designs for coins normally begin as a sketch or watercolor, then as an engraved, uniface (one-sided)

proof in base metal, thin foil or hard wax, and only finally in a production proof having both sides struck in various metals.

**dies (*troqueles*)** - a cylindrical rod of high carbon tool steel, the face of which is engraved with an incuse (recessed) pattern of characters or symbols. When two such dies are placed in a device such as a screw press<sup>qv</sup>, a blank disk of metal can be embossed with an impression in relief by bringing the dies together on it with great pressure. The process by which steel is engraved for dies involves heating to incandescence and slow cooling to soften the alloy (annealing). The softened die is then engraved, after which the die will be reheated and quenched (quickly cooled) at a specific temperature to harden the alloy by fixing its internal crystalline structure. If the die is quenched at too high a temperature it will be extremely hard, but brittle, and prone to cracking or chipping. If the die is quenched at too low a temperature, it will be relatively soft, and quickly show wear with use. (*see also* **planchet** and **screw press**).

**die defects (*defectos de troqueles*)** - any defect, scratch, chip, corrosion or rust on the surface of the die will produce a corresponding flaw or defect in the coins that are produced from that die. Methods for storage of iron and steel tools during the period offered few good options. While petroleum-based wax was ideal, many times wax produced from animal tallow was the only material available; it often contained salts used in the preservation process that corroded tools and dies. Rust on dies that resulted from poor preservation produced pits on the dies' surface that translated to a raised roughness or small bumps on the surface of coins struck from those dies. The improper or incomplete polishing of dies can leave fine lines on their surfaces that also effect the fields or background of coins.

Dies that were improperly hardened or abused develop cracks, chips and warping. Warping is the result of metal fatigue, and can appear as bulges on coins that produce the unusual patterns of wear often seen on the rays of cap and rays silver coins. Another die defect or damage resulted from clashed dies. This occurred when dies were brought together with great pressure without a planchet in the press. The pattern of the harder of the two dies will be partially transferred to the field of the opposite die. Clashed dies can produce a sunburst effect on the field behind the eagle on cap and rays silver. In extreme cases, even the inscription *LIBERTAD* is transferred (*see also* **weak strike**).

**dinero(s), D<sup>S</sup>** - a standard of purity of silver, the system is based on twelve *dineros* (12D<sup>S</sup>) being pure, unalloyed elemental silver. Each *dinero* could be divided into twenty-four *granos*. The term was and is also used in the vernacular as a synonym for money.

**Douglas, Quintin** - born in Edinburg, Scotland, Douglas was trained as a machinist. He located in Sinaloa in the late 1820s where he purchased a large ranch near Culiacán. He was briefly employed by Jecker, Torre & Co.<sup>qv</sup> during the modernization of the mint at Culiacán in 1849-1852. Douglas was a major investor in the leases of the mints of Hermosillo (1860-1871) and Alamos (1860-1872). [D-P]

**eagle** - (*see* **águila**)

**eagle, facing (*águila de frente*)**- term for the style of eagle facing to the right in the national emblem first adopted for official seals of Congress in 1823. It was designed by José María Torreblanca<sup>qv</sup>, an engraver at the Mexico City mint during the reign of Iturbide and again in the years after 1824.

This design was used for coinage and was virtually unchanged from 1825-1897. [TR]

**eagle, hookneck (*águila de perfil*)** - a term meaning profile eagle on early Republic of Mexico coins as well as some modern issues. It was first used by John Leonard Riddell, M.D. in his book *A Monograph of the Silver Dollar, Good and Bad*, originally printed in New Orleans, Louisiana in 1845. The profile eagle returned to the national emblem in 1916 when President Venustiano Carranza reversed changes made by Porfirio Díaz. This became official in 1932. [DB]

**eagle, profile - (*águila de perfil*)** - (*see eagle, hookneck*)

**edge (*canto*)** - the outer portion of the coin that is perpendicular to the surfaces.

**engraver (*gravador*)** - in numismatic terms, a highly skilled and trained craftsman tasked with fabricating dies for proofs, patterns, medals, tokens or production coinage. The engraver is also inaccurately designated or translated by some authors as a "die sinker," a term usually reserved for those who fabricate industrial dies. The comparison is similar to referring to a graphic artist as a house painter. Skilled engravers were very much in demand during the early years of the Republic as branch mints expanded their operations to increase profits and meet demands as mines became more productive (*see also Academia San Carlos*).

**error (*yerro, error*)** - an unintentional mistake involving the planchet or dies of a coin. Examples would be a gold planchet struck with 8 *Reales* dies, a misspelled word in a legend or the edge intended for one denomination used on another. By definition errors are not intentional or unauthorized changes such as using a one letter symbol for a mintmark for several years when the

law called for two. Repunched numbers, letters or figures cannot be considered errors although corrections to effect changes often are. In some cases error coins are highly valued while others are considered of little consequence.

***escudo de armas*** - literally "shield of arms." In traditional heraldry, the symbols of a family, individual monarch or nation are displayed on a shield-shaped field forming a coat of arms. On Republican coinage the coin itself became the shield bearing the emblems of the nation. (*see also Mexico, national emblem of*)

***escudo de plata*** - a Spanish colonial expression for eight *reales* in 17<sup>th</sup> and 18<sup>th</sup> century documents.

***escudo(s), escudo de oro, E*** - a term probably derived from the Italian *scudi* (a gold coin) and the Latin *scutum*, or shield. European gold and silver coins often featured the "shield" or arms of the ruler or ruling family. In the Republic, the *escudo* was the basic denomination for gold coinage.

***estrella(s)*** - a star is a frequent part of legends on coins. The heraldic star will have between five and eight points or rays.

**European (Paris or French) die style** - a style of dies that first appeared as a pattern 8 *reales* in 1831 at the mint of Durango. The mint had been leased in November 1829 to a partnership between a French citizen, Manuel Bras-de-Fer<sup>qv</sup> and a Mexican national, José Antonio Pescador. At the time of the fifteen year lease, the mint was in deplorable condition with obsolete equipment. In order to improve the quality of coinage and the mint's reputation, Bras-de-Fer may have contracted France's premier coiners, the *Monnaie de Paris*, to

produce high quality hubs or dies for use at Durango. While the importation of such tools was illegal, the mint was already breaking the law by placing cryptic initials on dies to identify legitimate coins. The French style Phrygian cap<sup>qv</sup> and Napoleonic design of the eagle featured on the new style were far better engraved than anything produced in Mexico at the time. While the *Monnaie de Paris* was producing official French coinage during the period, they were a private firm, and were not precluded by the government from producing dies, medals or coins for other entities until 1879. Due to the clandestine nature of these transactions, no conclusive historic evidence linking Durango with a French company probably remains. The fact that the Anglo-Mexican Minting Co. smuggled British dies for use at Guanajuato is, however, well documented as a parallel case. [HNM2][D-P][Doty]

**fardo(s)** - a burden in the form of a bale, bundle, or package not indicative of any particular measure of weight. [HNM1]

**feble** -/feb':lə/ n. Spanish, (Catalán dialect), a coin of debased metal or of insufficient weight. Both during the colonial era and in the Republic, the term was used to describe the legally allowable deficiency in purity or in weight of a precious metal coin caused by unavoidable variations of smelting and alloying or the mechanical inefficiencies of coining resulting from damaged or deficient equipment and tools. [TR]

**feble en ley** - the legal standard deviation for coinage as regards both weight and purity. It was established by Article 11 of the *Ley de Clasificación de Rentas*, February 20, 1822 (Supreme National Council), this law was the basis of all state and federal income. The weight (*peso*) *feble* was established as 8½ *granos* per mark of 8½ *Pesos* (68 *Reales*). [ $8\frac{1}{2} G^S = 2.397$  grams in 230.095 grams =

0.01042%.] The purity (*pureza*) *feble* established that a coin could be deficient in silver in the amount of 8½  $G^S$  of pure silver in one Mark. That deficiency would be expressed:  $[10 + 19/24] / 12 = .8993 = 0.0034\%$ . The *feble* for alloyed gold was of the same stringency. The new standard was more strict than those rules that governed the Spanish colonial mints in Mexico. [TR]

**flan (cospel)** - (see **planchet**)

**fly press (prensa de volante)** - A fly press is the type of screw press in which the screw shaft is driven by a flywheel or pair of *fly* weights at the ends of a bar. Boulton, Watt & Co.<sup>qv</sup> sold the mint at Culiacán a fly press that required six men to operate, and that allegedly could produce 10,000 *peso* sized coins a day. They also provided two similar "cutting out" fly presses to stamp planchet blanks for eight *reales* and smaller minor coins (see also **screw press**). [Doty]

**Garcia Cortina y Cia.** - the lessor and operator of the mint at San Luis Potosí from September 1861 to March 1872.

**Garcia Granados, Manuel** - leaseholder of the mint of Culiacán, 1855-1862. [D-P][HNM2]

**Georgy, H. Bernard** - leaseholder of the mint of Durango, November 29, 1847 to June 30, 1849. During his tenure the proliferation of counterfeits produced from old dies stolen from the mint became a serious problem. A government inquiry found that his countermeasures, including placing cryptic initials on coin dies, were illegal. Georgy lost the lease in 1849. [D-P][HNM2]

**gold** - a heavy yellow, metallic, highly malleable element (Au) used as a medium of exchange since antiquity. In Mexico many

silver deposits also contained gold that was extracted during the process of refining and smelting. In practice, Mexico had a bimetallic monetary standard in the 19<sup>th</sup> century that was based on an silver to gold exchange ratio of 16:1.

**Gordillo, Francisco** - born in Spain about 1750, he served as engraver at Sevilla (1774-1781) and Madrid (1782-1800). Gordillo was selected as Chief Engraver for the Mexico City mint in 1801. In addition to dies for production coinage, his medallic work was prolific. Gordillo is believed to have been the designer of the dies for the first profile eagle two *reales* issue of 1824. He was praised for his work as an engraver by noted jurist and senator Luis Gonzaga Cuevas in his book *Porvenir de México*, 1852. [HOH]

**gorro y rayos** - literally, cap and rays. This basic design was used on all *real* denominated coins and many minor copper or copper alloy coins. (see also **Phrygian cap** and **resplandores**)

**grabador(es)** - (see **engraver**).

**grano(s), G<sup>S</sup>** - the smallest unit in the system of weights where the *marco* or mark is equal to 4608 *granos*. The weight of the *grano* is 0.282 grams.

**Guerrero, José María** - a professor of engraving, possibly at the *Academia San Carlos*<sup>qv</sup> in Mexico City, Guerrero was the winner of the competition to design the new coins for the Republic October 9, 1823. His design for the silver eight *reales* and one-half *real* with the profile eagle in high relief, however, proved impractical for production coinage. Nevertheless, he received 2,425 *pesos* for dies, tools and his winning design. The style of the cap and eagle were changed in late 1824 to a facing eagle in lower relief.

[HOH]

**guitones** - a term for privately issued ranch or company tokens. Pradeau notes that these *fichas* were made from materials as diverse as copper, hard soap, brass or rawhide. [HNM2]

**hub (herramienta de troqueles)** - a heavy piece of metal, usually hardened tool steel, with a positive relief design on it. The hub design is nearly identical to an actual coin, although it may lack some details. It is used in conjunction with a press to make a coin die. The process involves the hub transferring the design to a die by multiple impressions (annealing<sup>qv</sup> or softening the future working die between impressions). The die is then hardened and used to produce coins. Riddell noted that the use of hubs was becoming widespread in Europe and the U.S. by the 1830s. [DB]

**interventor** - an inspector or official observer required by state law or contract provisions to be present within the mint. In some cases the *interventor* acted as an auditor, certifying the mint's records. [HNM2]

**Jecker, Torre & Co.** - a Franco-Mexican banking house and import/export company that took control of the majority of mint lease contracts in the decades of the 1850s and 1860s following the bankruptcy of the Manning & Marshall<sup>qv</sup> monopolies. The firm was founded by two French nationals, Jean Baptiste Jecker and his brother Louis, as well as a Swiss, Thomas de la Torre. They soon took control of mining interests in Pachuca, Guanajuato, Fresnillo, Taxco, Michoacán and Chihuahua. In 1860 an agreement was disclosed between President Comonfort and Jecker, Torre Co. in which Comonfort had granted the company the rights to all the public lands (*terrenos*

*baldios*) of the states of Sonora and Chihuahua in return for an undisclosed amount of funds. The firm's holding of Mexican government bonds at the time Juárez declared a moratorium on foreign debt payments was one major factor in the European and later the French Intervention. [Canudas][D-P][HNM2]

**Jennison, John** - (*see* Potts, John).

**Jiménez, José Mariano** - at various times director and assayer at the Guanajuato mint. Pradeau states that Jiménez directed the mint established by the insurgents led by Hidalgo in 1810 as well as the royalist mint of Guanajuato in 1812-1813. He is also known to have served as assayer in 1824-1825 during the production of the profile eagle eight *reales* and the facing eagle two *reales*. [HNM1&2][HOH]

*jolas* - a term for privately issued tradesman's tokens. [HNM2]

**Kelly y Cia.** - (*see* Potts, John).

***laminación*** - the process of rolling or hammering gold or silver into thinner plates from which round planchets were cut. The term is often used in reference to defects of the rolling process such as pits, streaks, or foreign matter in the final product. (*see also* **Planchet**, **Planchet flaws** and **Adjustment Marks**).

***Larrache y Compañía Sucesores*** - Mexican firm of merchants and financiers founded by the Spaniard José María Larrache. The firm held the lease of the mint at San Luis Potosí either in its own right or through proxies (Cia. Arrenda y Aria) from 1872 through 1893. [D-P]

***latón*** - (*see* Brass).

**laurel** - The laurel branch (*Laurus nobilis*) on the right of the national emblem of Mexico symbolizes victory in traditional heraldry.

**laurel berry (*bellota de laurel*)** - the laurel on the national emblem is fruiting with small round berries symbolizing fertility and fecundity.

**legend (*leyenda*)** - an inscription on coins in letters or numbers or a combination of both. Each silver *real* or gold *escudo* coin has two legends, for example REPUBLICA MEXICANA and \*2R.G<sup>A</sup>.1825.F.S.10D<sup>S</sup>.20G<sup>S</sup>.

***ley*** - the rule of law. In Mexican heraldry and numismatics the law is symbolized by the book of law on gold coins. Abbreviations of purity on gold or silver coins is also referred to as *de (buena) ley* (pure).

***Libertad*** - The inscription *LIBERTAD* on the Phrygian Cap on coins symbolizes the peoples' freedom from colonial rule and the freedoms guaranteed by the Constitution of the Republic. (*see also* **Phrygian Cap**).

**Mackintosh, Ewen Clark** - (1795-1861) British merchant and diplomat, an officer of Manning & Marshall Co. He became chief agent for the company in 1834. He was named British Consul to Mexico in 1839. Mackintosh was closely allied with Pres. Antonio López de Santa Anna and made extensive loans to the government throughout the 1840s and 1850s. He served as intermediary between U.S. diplomats and Santa Anna in the aftermath of the Mexican War, and helped negotiate the Treaty of Guadalupe Hidalgo (1848). By the 1850s, his predatory lending practices had alienated the government, leading to his bankruptcy in 1853. The vacuum left by the demise of Manning & Mackintosh was occupied by Jecker, Torre & Company<sup>qv</sup>. He withdrew

from business, but remained in Mexico. Mackintosh died in 1861 while still holding interests in the leases of several mints. [HNM2][Marshall, ed.]

**Manning & Marshall Co.** - a British merchant house representing London bankers Barclay and Herring in Mexico. It became prominent in the early 1820s after being founded by Robert Manning and William Skinner Marshall. The firm managed the interests of many British corporations in Mexico including the Anglo-Mexican Minting and Anglo-Mexican Mining Assns. The basic nature of the business changed with the death of Manning and the return of Marshall to England in 1834, which led to the naming of Ewen C. Mackintosh as its chief agent. The firm began making high interest loans to the Mexican government and was subsequently known as Manning & Mackintosh. Its fate was closely tied to that of Santa Anna, and it declared bankruptcy in 1853 (*see also* **Mackintosh, Ewen C.**).

**maravedí(es)** - an obsolete Spanish colonial copper coin with a nominal value of 1/34 of a *real*. The Native American population viewed copper as a symbol of poverty, and such coins were often refused or discarded. (*see also* **tlaco**) [HNM1]

**mark (marco), M<sup>S</sup>** - One half of a pound (*libra*). In different systems of weights of precious metals (gold and silver), the mark was divided into either 4800 or 4608 *granos* (G<sup>S</sup>). In colonial measurements until 1731 gold was measured in the 4800 G<sup>S</sup> scale and silver using the mark of 4608 G<sup>S</sup>. The Republic adopted the latter scale for the weights of all precious metals. For purposes of coinage, the mark was always equal to 8½ pesos of alloyed silver of 0.9027 purity. This practice of measuring precious metals in their alloyed form was the standard in

Europe; the **Pound Sterling** was one Troy pound of alloyed silver of 0.825 purity (*see also* **Weights and Measures**).

**matrices - troqueles** (*see* **dies**).

**medal axis, alignment (eje de medalla)** - each side of a coin is so situated that when the side facing the holder is rotated 180° (along a vertical axis) to the right or left of the holder the opposite side will be properly oriented.

**medio** - a term generally applied to the small 16mm, 1.69 gram, silver ½ Real. It was first issued by the Republic in 1824. Its weight is identical to the ½ Escudo (1814-1869) and the one peso gold (1870-1905). [HOH]

**Mejia, Ignacio** - director of the state mint at Oaxaca, March 25, 1858 to April 4, 1872. He was a long time supporter of the former governor, Benito Juárez, and the liberal cause. [HNM2]

**México die style (estilo de México)** - by law the standard for all *real* and *escudo* coinage was to be set by personnel at the mint in the *Ciudad de México*. Federal law (*Ley de Clasificación de Rentas*, February 20, 1822 and November 16, 1824) prescribed that tools (and perhaps dies) would be sent by the central mint to all branch mints to be replicated by the engravers there. In practical terms, this almost guaranteed that there would be differences in the coins produced by each branch mint. Following the change from the profile eagle to the facing eagle in 1824, only a few small changes in the die style of silver and gold coinage can be identified in the coins produced by the Mexico City mint. These may have more to do with improvements in equipment, tools, materials and automation than with any intent on the part of mint personnel to alter the basic styles prescribed

by Congress and codified in law (*see also* Decree of August 1, 1823).

**Mexico, national emblem of** - adopted by the Congress on April 14, 1823, the national emblem was first designed by José María Torreblanca incorporating the Native American symbols of the founding of Tenochtitlan or Mexico City. In Torreblanca's design the facing eagle perches on a *nopal* or cactus growing from a rocky island in the midst of the waters of Lake Texcoco. The eagle grips a water snake in its beak and right claw. To the left is an oak bough and to the right a bough of laurel, symbolizing strength and victory in European heraldry. The boughs are joined at the base with a band or ribbon.

**mint (*casa de moneda, ceca*)** - In Mexico minting operations included purchasing precious metals from mining companies, assaying purity, smelting and refining, and arranging financial transfers in addition to the actual production of coins. In most cases mint operations were governed by both federal law and detailed lease provisions or conditions imposed by the states. The public and the politicians were probably correct in their assumption that national and local interests were poorly served by the mints and that profits were excessive. At various times, the majority of mints were controlled by foreign corporations, adding to public mistrust. In reality, the costs of modernizing and industrializing mint operations were very high, and many firms took years to realize profits. Typical mint employees included a "director, an accountant, auditor (of coins), administrator, treasurer, weights administrator, state assayer, assayer, master of weights, foundry master (smelter), die sinker (engraver), assistant die sinker, chief of security, security guards, a doorman, and a janitor," from *Provisions of the Lease of the Mint at Guadalajara, 1826*. [HNM2]

**Mints of Mexico (*Casas de Moneda de México*)** - in addition to the mint at Mexico City, thirteen state mints produced coins of the real/escudo denominations in gold, silver or copper at various times. They were:  
 Alamos (*Sonora*) - 8.1860 - 6.1895.  
 Catorce (*San Luis Potosí*) - 2.1861-11.1869.  
 Chihuahua (*Chihuahua*) - 1831 - 6.1895.  
 Culiacán (*Sinaloa*) - 1846 - 1897.  
 Durango (*Durango*) - 5.1824 - 6.1895.  
 Estado de México (Tlalpam) - 2.1828 - 6.1830.  
 Guadalajara (*Jalisco*) - 1825 - 6.1895.  
 Guadalupe y Calvo (*Chihuahua*) - 10.1843 - 5.1852.  
 Guanajuato (*Guanajuato*) - 1824 - 1897.  
 Hermosillo (*Sonora*) - 10.1831 - 6.1895.  
 Oaxaca (*Oaxaca*) - 3.1858 - 7.1893.  
 San Luis Potosí (*San Luis Potosí*) - 10.1827 - 5.1893.  
 Zacatecas (*Zacatecas*) - 1825 - 1897.

The state mints are referred to in some references as branch mints. Based on laws ratified in 1822 and 1824, states had the right to unlimited base metal coinage, while the production of precious metal coins was highly regulated.

**mintmark, MM (*ceca*)** -

***moneda(s)*** - coin(s) or currency.

***moneda de vellón*** - a term for any base metal coinage.

**Mucharraz, José Antonio** - (1798-1872) an early graduate of the *Escuela Real de Minas* of Mexico City, he was an accomplished minerologist and metallurgist employed by mine owners in Guanajuato. With the coming of independence, he was chosen by General Luis Cortázar and director Bernardo Galindo as the first assayer of the new mint of Guanajuato. His initials appear on the insurgent issues of 1821-1822, the profile eagle eight *reales* issue of 1824 and probably some issues of 1828. Mucharraz later was assayer at the mint of Chihuahua in the 1830s and at San Luis Potosí in the

1840s. He gave expert testimony before a Congressional committee on mining in México in 1868. [Canudas][D-P][HNM2]

**nopal** - a term for one of several species of cacti alternatively identified as (*Nopalea coccinellifera*) or as (*Opuntia ficus-indica*). The cactus is used as a regional symbol typical of Mexico's high desert flora. The *nopal*, full of its fruits (*tunas*) was known to the Aztec people as *tenochtli*, the source of the place name for Mexico City, *Tenochtitlan*. (see also **Mexico, national emblem of**).

**numismatic terms (Spanish - English) -**

(see also **términos numismáticos (Inglés - Español)**)

*agujero* - hole

*agujero mal tapado* - badly plugged (-)

*bien troquelada* - well struck

*brillo* - luster

*casi sin circulación (circular)* - AU

*centros débiles* - soft centers

*cospel* - planchet

*debilidad* - weak or weakness

*defectos* - problems, defects

*ensayador* - assayer

*escasa* - scarce

*flor de cuño* - perfect coin

*golpe* - hit or nick

*golpe en canto* - rim nick

*golpecito* - little nick

*golpe* - can sometimes refer to the strike such as *ligereza central de golpe*

which literally translates into English as "weakness in the center of the strike" or a free translation of "softly struck centers."

*herrumbre* - rust, corrosion

*ligera* - light, as in *ligera pátina*

*limpiada* - cleaned

*mancha(s)* - stain

*mejor conocido* - the best known

*pátina* - toning

*pátina tornasol* - iridescent toning (also *pátina tornasolada* or *pátina iridescente*)

*pátina oscura* - very dark toning

*pátinada* - toned

*perforada (perforación)* - holed

*picada* - pitted (also *puntazo*)

*piquete(s)* - dig or pit

*poroso* - porous

*rara* - rare

*rayon(es)* - scratches

*rayoncitos* - light scratches

*rayones fuertes* - deep scratches

*resello* - countermark, stamp

*sin circulación (circular)* - UNC

*sobrefecha* - overdate

*soldadura* - soldered (rim, edge)

*tornasol* - iridescence

*troquel* - die

**oak (roble)** - The oak (*Quercus alba et al.*)

bought to the left of the national coat of arms symbolizes strength in traditional heraldry.

**obverse (anverso)** - The obverse (side) of Mexican Republic coins is defined by a government decree (1.8.1823, ¶2.) as the side bearing the national emblem and the name of the country. [2. *Tendrán un anverso común las monedas de oro plata y cobre, estampándose en ellas el escudo de armas de la Nación Mexicana con esta inscripción en la circunferencia: REPUBLICA MEXICANA.*] Many researchers and collectors both in Mexico and elsewhere disagree with this designation and refer to the dated side of the coin as the obverse. [HOH] [D-P] [HNM2]

**ochava(s), 8<sup>S</sup>** - A measure of precious metal weight, so called because it is  $\frac{1}{8}$ <sup>th</sup> of an ounce (*onza*) or 72 *granos* in the mark (*marco*) of 4608 *granos*. The *ochava* is equal to one silver *Real* or  $\frac{1}{8}$  *Peso*.

**octavo(s),  $\frac{1}{8}$ R, 8<sup>O</sup>** - A small copper or bronze coin of nominal  $\frac{1}{8}$  *Real* value roughly the same size (20mm) as the one *real* silver. *Octavos* were issued by states, companies and the federal government.

**onza(s)** - a precious metal measurement of silver equal to 27.073 grams of an alloy of 90.27 percent silver and 9.73 percent copper. As a term, *onza* is also expressed as one *peso* or eight *reales*. There were  $8\frac{1}{2}$  *onzas* in one *marco* or mark of silver alloy.

**oro** - (*see* gold)

**overassayer** (*sobre iniciales del ensayador o sobremarca del ensayador o sobresigla del ensayador*) - a changed or corrected die having evidence of overstriking of one or both of the assayer's initials in the legend. This was a relatively common practice during the early Republic when assayers changed in mid-year or when it became necessary to rehabilitate old dies for reuse.

**overdate** (*sobrefecha*) - the result of re-engraving or over-stamping one or more of the digits of the date on an existing die. This was a common practice and allowed servicable dies to be redated. If done skillfully, the overdate is nearly invisible; many, however, are obvious and poorly done. Overdates are indicated in text, for example, as 1826/5, that is, a numeral six has been stamped over an existing numeral five. If the third digit of the date has been altered, a common practice when the decade changed, it should be expressed 1830 3/2.

**ornamental edge** (*canto ornamental*) - (*see* Colonial edge and Republican edge).

**Palamade de la Roche & Cia.** - leaseholder of the mint at Mexico City from April 13, 1847 to April 6, 1857. [D-P][HNM2]

**panilla**- In dry weight measurement, the *panilla* was equal to  $\frac{1}{4}$  of the pound (*libra*). The *arroba* was divided into 100 *panillas* (*see also* Weights and Measures).

**Patiño-Ixtolinque, Pedro** - sculptor born in Mexico of a Spanish father and *mestiza* mother. He studied briefly at the *Academia San Carlos*<sup>qv</sup> as well as with the sculptor Tolsá. He produced several award winning engravings and received numerous grants. Patiño was one of the judges in the design contest for the first coins of the new republic in 1823. He later served on the México City council in 1825 and was named director of the *Academia San Carlos* in 1826. [HOH]

**pattern** (*prueba*) - a term for one or two sided medals or coins intended to present a proposed or changed design. Patterns are often struck in base metals, thin foils, hard wax or precious metal alloys. Patterns in the *Republica Mexicana* were sometimes produced in large numbers for promotional distribution to government officials as well as in very limited quantities for mint officers. The majority of patterns never became production coinage; they comprise a separate field of numismatic research.

**pearls** (*perlas*) - a beaded pattern used as an outer border on coins (*see also* denticles).

**peseta(s)** - a Spanish colonial term for a silver coin valued at two *reales*. The term was still widely used in the nineteenth century; it was first used in Spain ca. 1709. [HNM2]

**peso de oro** - The *peso* of gold, also referred to as one *castellano*, is equivalent in value to the silver *peso* or  $\frac{1}{2}$  *escudo*. Its weight was 96 *granos* (G<sup>S</sup>) or  $\frac{1}{50}$ <sup>th</sup> of the *marco* of gold calculated based on the 4608 G<sup>S</sup> scale.

**peso(s)** - literally "weight." The *peso* of 8 *reales* or  $\frac{1}{2}$  *escudo* was often superior in value to the U.S. dollar in international trade and circulated widely in the U.S. on equal terms until after the American Civil War. As a medium of exchange in the Far East, no

other trade currency could long compete with the *peso* due to its reputation for purity. All domestic fiscal plans and contracts in 19<sup>th</sup> century Mexico were stated in *pesos*.

**Phrygian or Liberty cap (*gorro de libertad*)** - a soft, red conical cap also known in Latin as a *pileus*. The Phrygian cap became known in antiquity as a graphic sign of freedom from slavery. It was a prominent symbol of revolutionary democratic movements in both France and the United States of America in the late 18<sup>th</sup> century. It was adopted by Mexican insurgents during the War of Independence against Spanish colonial forces and became a central symbol on republican coinage in 1823.

***pilón(es)*** - tokens of one-sixteenth of a *real* issued by merchants, mining companies and *haciendas* during the colonial period. Later government issued pilónes were of  $\frac{1}{8}$  *real* denomination. The term became obsolete during the early republican period. [HNMI]

**planchet (*cospel*)** - a circular blank disk of metal cut from a rolled or hammered flat plate of stock which is the material of a coin. Also known as a **flan**, in normal mint operations, the planchet was not complete until the edge was applied and a final cleaning of the surface was made (*see also Republican edge (canto republicano)*).

**planchet flaws (*defectos de cospel*)**- the quality of planchets was often below par at less well equipped mints such as Alamos, Chihuahua, Culiacán, Guadalajara, Guadalupe y Calvo, and Oaxaca, although poor quality plagued all of the mints of Mexico at one time or another. Planchets were still being crudely cast at several mints as late as 1850. As many branch mints were still smelting metals with locally produced charcoal, fly ash often became mixed with molten metal producing voids in finished

planchets and coins. Defective manufacture also accounts for results on finished coins such as streaks, visible corrosion and bubbled or frothy surfaces, as well as problems with undersized or oversized coins. Problems with the edge are also common, often caused by using mill dies for eight *reales* coins on smaller minors (*see also laminación*). [B&H] [HOH] [D-P]

***plata*** - (*see silver*).

**Potts, John (*Juan*)** - British entrepreneur and industrialist, first employed with the Anglo-Mexican Mint Association at Guanajuato, he later obtained the lease of the mint at Chihuahua in late 1839 in partnership with his brother Frederick and John Jennison, incorporated as Kelly & Co. The firm bought coin presses, dies and tools from Boulton, Watt & Co. of Soho. Dies for the eight *escudos* and eight *reales* coins as well as the *real* and the half *real* of late 1840 seem identical to those produced by the Soho firm for Guanajuato ten years earlier. M. Rondé, a French visitor to the mint in 1849 said "it is administered by two intelligent Englishmen, the Potts brothers. The vast subterranean workshop is driven by steam." Potts' association with the Chihuahua mint and mining interests were lengthy and endured through several partnerships; among them one as Potts, Garnis & Muñoz. Along with José Cordero, he was considered one of the state's wealthiest merchants. He served as the acting British consul in Chihuahua and protected U.S. business interests there during the Mexican War of 1846-1848. Potts was also an amateur naturalist, identifying and reporting many unique species of plants and animals in that area. A species of cactus, *ferocactus pottsi*, was named in his honor. His brother, Francisco (Frederick) Potts, was listed as state assayer there in 1865-1866.

[Doty][D-P] [HN2] [R.B. Brown "John Potts of Chihuahua," 1998]

**pound (libra), Lb., L<sup>S</sup>** - a measure of precious metal weight equal to two *marcos*. Although the pound or *libra* was the basis of the system, the mark or *marco* was the most frequently used term in the mines and mints. Evidence from the mint at Guanajuato seems to indicate the mark was used most because of its prominence in purity calculations while the *peso* was the basis of coin weights. [HN2][TR]

**purity (pureza)** - (see *dinero*, *ley* and *quilate*).

**quartillo(as)**- (see *cuartillo*).

**quilate(s), Q<sup>S</sup>** - the standard term used for the purity of gold. One *quilate* is equal to 1/24<sup>th</sup> of pure gold in an alloy, and is exactly parallel to the carat system of purity. The standard for *escudo* gold coinage was 21 *quilates* expressed as 21Q<sup>S</sup>, an alloy of 0.875 gold and 0.125 copper.

**quintal(es)** - In dry weight measurement, the *quintal* was equal to 100 pounds (*libras*). (see also **Weights and Measures**).

**rafagas de luz** - shafts or reflections of light (see **resplandores**).

**real(es), R, R<sup>S</sup>** - the *real* was the basic unit of all silver and copper coinage in Colonial Mexico as well as the Republic of Mexico through the early 1870s (8 *Reales* as late as 1897) until the complete changeover to a decimal system. One *real* was the equivalent of 12½ *centavos* in the Decimal System. The one *real* coin was approximately 20mm in diameter, was of standard purity, and weighed 3.38 grams. The nominal fiscal unit of national currency was the *peso* or eight *reales*. The *peso* was also known as the *onza*. In international trade, the *peso* was

valued at roughly 1.01 U.S. dollars in the nineteenth century. *Real* based silver coinage existed in denominations of ½, 1, 2, 4, and 8 *reales*. Copper coinage normally existed in denominations of ¼, ⅛ and ⅙ *real*. [DB]

**Republican edge (canto republicano)** - the edges of silver coins (1823-1897) were given a new pattern which was probably based on a design by José Torreblanca. The pattern has been likened to the tail of the rattlesnake. In its simplest form, it consists of a series of impressions similar to [°[°[° or (•)(•)(•)(•). The gold coins of the Republic retained the oblique reeding of the Colonial period. [HOH]

**resplandores** - a graphic representation of brilliant shafts of light radiating from a central source. The *resplandor* (also known as *rafagas de luz*) was a common feature on Roman Catholic religious icons depicting a *santo* or saint surrounded by an aura of light. They were introduced into Mexico by the Spanish. The use of this religious symbolism of the *resplandor* behind the liberty cap was an obvious effort by Congress to lend religious legitimacy to the secular symbols of the new Republic (see also **Phrygian or Liberty cap**).

**reverse (reverso)** - By law the reverse (side) of coins of the Republica Mexicana is the side opposite the national emblem and the name of the country. This would, therefore, be the side with the date, mintmark, and assayer's initials. (see also **obverse**)

**Revilla, Bernardo** - lessor and only bidder for the state operated mint at Chihuahua. The newspaper *El Fanal de Chihuahua* announced October 21, 1834 that Governor José Joaquin Calvo had signed the contract for the state. Revilla hired José Antonio Mucharraz,<sup>qv</sup> formerly of Guanajuato, as

assayer. At the time of the lease, the mint was flooding the state with 30,000 pesos in copper minor coins, causing inflation and contributing to the mint's poor reputation. In November 1834, Governor Calvo ordered that the large quantities of silver coin from Durango in the local economy be taken to the mint, smelted and restruck. This may have been due to a belief that they were of less than required purity. Bernardo Revilla briefly served as the governor of Chihuahua from October 1838 until January 1839. He abandoned the lease late in 1839. (*see also Potts, John*) [R.B. Brown][HNM2]

**rolling mill (*molino de chapado*)** - a machine used to flatten plates of metal for planchets<sup>qv</sup>. Mills were powered by draft animals or by steam engines. Rolling mills manufactured in Britain are known to have been used at Culiacán, Chihuahua and Guanajuato. When used in conjunction with a cutting press such equipment vastly improved mint efficiency and speed of production. [Doty]

**Rubio, Cayetano** - Mexican financier and industrialist, leaseholder of the mint of San Luis Potosí and the mines of Catorce from September 7, 1857 to September 12, 1861. Cayetano also had control of a tobacco monopoly under Santa Anna, as well as the textile industry's Hércules Cotton Mills of Querétaro and Tlalpam. [Canudas][HNM2]

**Sanabria, Pomposo** - an engraver and assayer at the mint of San Luis Potosí, he was later hired as engraver at the new mint at Catorce. Evidence suggests that he gave his employers tools and dies from the state mint in violation of federal law. He returned to the mint at San Luis Potosí following the defeat of Maximilian and the restoration of the Republic and was the state assayer 1867-1870.

**Santos de la Maza, Jorge** - a businessman and promoter of San Luis Potosí, he lobbied the government for many years in an effort to open a second mint in the state to break the monopoly of Cayetano Rubio<sup>qv</sup>, who held the lease on the mint at San Luis Potosí from 1857-61. Over many objections, President Benito Juárez authorized a second mint in the city of [*Real de*] Catorce in February 1861. The terms of the lease awarded to Santos de la Maza and his partners were quite generous, adding to the outcry from supporters of the San Luis Potosí mint. After considerable investment, including a new steam powered coin press manufactured by Morgan, Orr & Co. of Philadelphia, the mint only struck coins dated 1863. It was occupied during the French Intervention and closed by the state government in 1869. Many questions remain regarding reports of mint output during 1864 and 1865. [D-P][HNM2]

**Santoyo, Leonardo** - leaseholder of the mint of Hermosillo, September 29, 1831 to January 29, 1836. [D-P][HNM2]

**screw press (*prensa de tornillo*)** - the screw press was introduced at the mint of Mexico City sometime in the late 1600s. This earliest major advance in mechanization produced coins that were more regular, higher quality, and more difficult to counterfeit. In its simplest form, the screw press is simply a large vise arranged to bring the dies together vertically. The screw press could be used both to strike coins and to cut planchets. Early versions of the screw press were huge, cast iron machines with bulky counterweights to make operation more regular. Such an early screw press has been depicted on a number of coins and medals struck by the mint of Mexico City (*see also dies*).

**señales** - small, base metal tokens issued by merchants, mining companies and *haciendas* for use in transactions less than  $\frac{1}{4}$  *real*. Alberto Pradeau describes them as the equivalent of an I.O.U. [HNM1]

**Sherriff, John** - British artist and engraver, he was responsible for the design of the "Soho" style dies used for coinage at Guanajuato and elsewhere ca. 1835-1843 (*see also* **Boulton, Watt & Co.**). [Doty]

**silver (*plata*)** - a heavy, highly malleable metallic element (Ag) considered precious since early antiquity. In the Republic, alloys with copper of roughly 9:1 ratio were used for coinage. Silver alloy was exchanged at the mints for gold alloy of 87.5 percent purity at an official 16:1 rate, although gold in the 19<sup>th</sup> century market was frequently more valuable. The silver ores of most Mexican mines produced a product that was, on average, of 0.917 purity (11 *Dineros* in the terms of the period). Beginning in the sixteenth century, Mexico was among the most important gold and silver mining areas of the world. [HNM2]

**smelter (*maestro de fundir*)** - mint official responsible for alloying, refining and casting operations. Duties listed in the 1826 instructions for the mint at Guadalajara, articles 46 and 47 state, "The master smelter will have the obligation of making all foundry alloys, insuring that they are prepared according to the standard the law requires. He will personally prepare and place the [crucible in the] hearth for the smelt of the metals, therefore avoiding any defect." [HNM2]

**snake (*serpiente, vibora*)** - the history of the snake in the national emblem of Mexico is complex. The Aztec manuscripts illustrating the legend of the founding of Tenochtitlan or Mexico City lack any clear reference to a

snake. Based on an incorrect translation of those manuscripts Father Diego Durán took the reference to a water snake and used it as the symbol of sin and evil and the eagle to represent the Christian good. This allegory, while useful to the Europeans, would have been meaningless to the Aztecs, who held the water snake as a symbol of wisdom. This myth was perpetuated by Durán in his *Atlas de la Historia de los Indios* published in 1581. The water snake became a rattlesnake in 1916 in designs of the national emblem by Antonio Gómez and Jorge Enciso. This was confirmed in 1968 with the adoption of painter Francisco Eppens Helguera's concept ordered by President Gustavo Díaz Ordaz.

**snake, defiant (*serpiente desafiante*)** - a variety of the snake in the national emblem depicted on eight *reales* coins of the Durango mint in 1824. The snake is shown in an aggressive posture with an arrow shaped tongue symbolizing venom or poison. This graphic depiction of the defiant snake left the viewer with the impression that the struggle between the eagle and the snake had a questionable outcome. For that reason, officials may have demanded the design of the snake be changed. [HOH]

**snake, folded (*serpiente plegada*)** - a variety of the snake in the national emblem depicted on one-half, one and eight *reales* coins of the Durango mint in 1824. The depiction suggests a dying, contorted snake with its head hanging limply. [HOH]

**snake, submissive (*serpiente sumisa*)** - a variety of the snake in the national emblem depicted on eight *reales* coins of the Durango mint in 1824. The submissive variety suggests a dead snake. One variant has what appears to be a fin behind the snake's head caused by an engraving error. [HOH]

**Sociedad Guanajuatense Zacatecana** - a firm with both Mexican and foreign investors that held leases on both the Guanajuato and Zacatecas mints from July 1, 1876 to June 30, 1895. Later, during the administration of Pres. Porfirio Díaz, the federal government assumed control.

**Soho (Birmingham)** - (see Boulton, Watt & Co.)

**Soho die style** - dies designed and produced at the Soho mint in Birmingham, England (Boulton, Watt & Co.<sup>qv</sup>.) by the engraver John Sherriff<sup>qv</sup>. They were intended for ½R, 1R, 2R and 4R denominations as well as for some gold issues. They were first created in February 1835, sent to Guanajuato that year and utilized until the early 1840s. Very similar designs can be found in the Chihuahua ½R and 1R issues but their origin with the Soho mint cannot be confirmed (Doty, 253-4).

**Sonora die style** - dies that may have been designed at the Soho mint in the United Kingdom but it cannot yet be proven without a doubt (Doty, 253), (see also James O. Sweeny, *A Numismatic History of the Birmingham Mint*, The Birmingham Mint Ltd., Birmingham, 1981, as well as H. W. Dickinson, *Matthew Boulton*, Cambridge University Press, Cambridge, England, 1936). It is surmised that the English firm prepared the dies for the Culiacán Mint; but at times the mints at Alamos, Guadalupe y Calvo and Hermosillo also used them. Some call such dies the British Style. The first evidence of the use of the Sonora style is a pattern eight reales dated 1851. It is not likely that Boulton, Watt & Co. had any part in this pattern, since the company had been liquidated and all equipment sold in April 1850. It is probable that this new style is an entirely Mexican innovation.

[Doty][D-P][DB]

**Stahlknecht, Hermann** - leaseholder of the mint of Durango, February 19, 1845 to November 29, 1847. Under his directorship, the French style cap and rays continued in use, but the eagle returned to a Mexico City style. The mint was plagued by counterfeit coins produced from old dies that had been stolen. These false coins were discussed by Riddell in his *Monograph of the Silver Dollar* (1845). [D-P][HNM2]

**style (estilo)** - is a difference within a **type** while the basic design elements remain the same. The most noticeable style difference in the Cap & Rays series is the hookneck or profile eagle contrasted with the facing eagle. Both are the same **type**, but they have a different **style** of the cap, rays, eagle, snake, wreath, cacti, and lettering. Another example could be a certain timeframe such as 1835 to 1843, when the caps and the eagles were designed and/or positioned differently on coins struck before the earlier date and after the latter. Due to the latitude given to branch mints, differences in tools often have the unintended result of creating a distinctly different die style. **Styles** are often confused with **varieties**.

**Suárez, Francisco** - state assayer at the mint of Guadalajara during the early years of the republic. Pradeau's research found that in 1835 a board had concluded that "gold coins minted in Guadalajara were from four to sixteen grains lighter than those pieces of the same value struck in the other mints of the country. Because of this infraction, [mint] director [Santiago] Guzmán was suspended. The accountant, the treasurer, and assayer Francisco Suárez, whose initials F.S. appear on the coins struck between 1818 and 1835, were investigated. Suárez was prosecuted, but his sudden death suspended judicial action."

[HNM2]

**Symon, Robert R.** - British entrepreneur representing both London and U.S. interests, who held the lease on the mint at Alamos (*Estado de Sonora*) first in partnership with William Miller and Quintin Douglas<sup>qv</sup> (1860-72) and as Symon & Cia. (1876-95). Symon also controlled the lease on the mint at Hermosillo through *Quintin Douglas y Socios* (1860-71) and as Symon & Cia. (1876-1895). Both Alamos and Hermosillo mints were in deplorable condition when Symon assumed responsibility and both required substantial investments to become efficient. Symon's other involvements in Mexico included acting as vice-president of the Sinaloa & Durango Railroad and the Mexican Central Railway Co. of Boston, Massachusetts and Mexico City. In another partnership as Symon & Camacho, he was leaseholder at Guadalajara and Durango 1880-1895 (*see also Compañía Limitada Central de Casas de Moneda de México*). [D-P][HNM2]

**tanteos** - a term for privately issued tradesman's tokens. [HNM2]

**Temple, Jonathan (Juan)** - (1796-1866) early California settler, entrepreneur and financier who held the lease on the mint of Mexico City, first in partnership with Alejandro Bellangé as Bellangé & Temple (1857-1858), and in his own right (1858-1869). During the latter lease, Bellangé acted as mint director, along with José Mendizabal. Temple was a friend and associate of Comonfort and supported the causes of the conservatives during the War of the Reform. He made large loans to the government in those difficult times. He had married into a prominent Mexican family in Los Angeles (1827), and in 1848, his daughter Francisca married a wealthy merchant from Bilbao, Gregorio de Ajuría, also an active opponent of the reformers. Shortly before his death in July 1872, Juárez

called for financial help for the nation, a call that was answered by the daughter of his former political opponent Jonathan Temple. Francisca Temple de Ajuría was awarded the mint lease in 1872 and held it until 1893 when it was rescinded by the administration of Porfirio Díaz. [Alexander, "Juan Temple and the Mint of Mexico," 1973][Canudas] [D-P][HNM2]

**tercio** - In dry weight measurement, the *carga* was divided into two *tercios* of 150 pounds each (*see also Weights and Measures*).

**términos numismáticos (Inglés - Español) -**

assayer - *ensayador*  
 AU - *casi sin circulación*  
 badly plugged hole - *agujero mal tapado*  
 best one known - *mejor conocido*  
 BU - *flor de cuño*  
 chop marks - *resellos orientales*  
 cleaned - *limpiada*  
 countermark - *resello*  
 iridescence toning - *pátina tornasol*  
 die(s) - *troquel(es)*  
 die crack - *grieta de troqueles*  
 gouge - *golpe*  
 holed - *perforada (perforación)*  
 light - *ligera*  
 light toning - *ligera pátina*  
 little nick - *golpecito*  
 luster, lustrous - *brillo*  
 overdate - *sobrefecha*  
 pits (digs) - *piquete(s)*  
 pitted - *puntazo*  
 planchet - *cospel*  
 polishing lines - *rayoncitos*  
 porous - *poroso*  
 problems - *defectos*  
 rare - *rara*  
 rim dent, nick - *golpe en canto*  
 rust, corrosion - *herrumbre, corrosión*  
 scarce - *escasa*  
 scratch(es) - *rayon(es)*  
 scratches, deep - *rayones fuertes*  
 soft centers - *centros débiles*

solder(ed) - *soldadura*

stain(s) - *mancha(s)*

toned - *tornasol*

toning - *pátina*

UNC - *sin circulación (circular)*

very dark toning - *pátina oscura*

weakness - *debilidad, débil*

well struck - *bien troquelada*

**tlaco(s)** - Native American term for any small coin of little value. Later a 22mm colonial  $\frac{2}{4}$  bronze  $\frac{1}{4}$  *real* coin (1814-1821). In the Republic the term was used for any copper or bronze  $\frac{1}{8}$  *real* coin.

**token (ficha)** - a term for a metal disk of various shapes used as a medium of exchange. In 19th century Mexico mining companies, *haciendas* and stores often issued tokens having nominal values usually less than one *real*. Workers were often compelled to accept tokens for their labor in lieu of legal currency. These base metal tokens had no intrinsic value, and were outlawed and made the legal equivalent of counterfeiting under the Constitution of 1857, Articles 3, 72 and 114 (*see also señales and pilónes*). [HN2]

**tomín(es), T<sup>S</sup>** - a measure of precious metal weight equal to 0.5993 grams. One *tomín* was equal to 12 *granos* (*see also Weights and Measures*).

**Torreblanca, José Mariano** - artist and engraver, his earlier work included the dies for coins of the short lived Iturbide regime. His design for the national emblem featuring the facing eagle had been adopted by the Supreme Congress even before its approval for coins. It appears on the seals of early official documents. He was offered 500 *pesos* for his submissions in the competition for the design of the national coinage in October 1823, but chose to accept a position at the Mexico City mint instead. His

watercolor sketches of proposed coin designs included the edge for silver coins that was eventually adopted (*see also Mexico, national emblem of*). [HOH] [HN2]

**tostón(es)** - a term with origins in the early Spanish colonial period for any coin valued at four *reales*. It was still used in the 19<sup>th</sup> century in some areas of Mexico.

**troquel(es)** - (*see dies*).

**type (tipo)** - in a numismatic sense **type** is defined as is a “classification of a coin by its nationality, denomination, metal content, and specific design elements.” The term **type**, in order to have any utility whatever, must be strictly defined as a coin within a structure limited to a recognized historic period, a denomination and a specific mint. Thus, a coin of the Republic of Mexico, of any one of the *real/escudo* denominations, produced by one of the various mints can accurately be described as a coin of a particular **type** or as a **type coin**. Within a type one can identify different die styles, dates, assayers, varieties and often variants; none of those variables represent a change in the basic type of the coin described. [DB]

**variant, var. (variante, variación)** - a term for minor but recognizable differences of detail on coins having the same basic die style and/or of the same date. Examples would be number and placement of rays, slight changes in the shape of the cap, missing periods or dots, different size or style of lettering fonts, doubled letters or numbers, or other repunched details. Such differences do not rise to the level of a change of variety or of style, but are often due to changed tools, or adjustments (sometimes even made by different engravers) when working on worn or damaged dies. [DB][TR]

**variety (*variedad*)** - a significant difference within a basic Type and Style, such as an overdate, overassayer, missing letters, or a major error (unintentional or otherwise). The existence of coins having both coin and medal axis within the same year would also constitute two different varieties. [DB]

**Vega, Fortunato de la** - leaseholder of the mint of Culiacán, 1862-1870. [D-P][HNM2]

**Ward, Henry George** - (1797-1860) British diplomat and politician, he served as consul at the embassy in Mexico from 1825 through 1827. His two volume work *Mexico in 1827*, was instrumental in promoting investment in Mexico's mining and minting industries. It suggested wildly optimistic levels of profit that led many to lose fortunes in failed mining ventures. In his favor, Ward advocated the employment of local personnel in positions of authority and cautioned against the dangers of European employees going native. His descriptions of the mines and some of the minting operations are priceless. It is a key historic document in understanding the British domination of the early mints and mining ventures of the Republic.

**weak strike (*anverso/reverso débil*)** - also known as a flat strike or as weak centers (*centros débiles*). A condition produced by a defect of process when the dies do not have sufficient pressure applied to force metal of the planchet to the full extent or depth of the dies. Common features of coins exhibiting a weak strike will be flat areas either in the center of the designs or in the rims and legends. Weak strikes were often intentional, since they extend the life of the working dies by reducing wear. They can also be caused by worn presses or steam powered presses operated at speeds too high to allow a full strike..

**Weights, Master of (*Maestro de Pesos*)**- a mint officer, who, according to the terms of the Guadalajara lease, 1826, ¶ s 43, 45, has "full knowledge of weighing procedures and machines. [He will] personally weigh all silver and gold and other metals that come into the mint, and also all the metals that leave the mint to the public. [He] has the final word concerning the accurate weight of each coin, bar, etc. [He] will also be in charge of arrangements for the preparation of the blanks (planchets), the edging and acid baths; making sure that after the acid baths all blanks are of legitimate weight." The "acid baths" referred to are also known as "pickle," and is a heated solution of sulfuric acid used to clean impurities from the surface of planchets. [HNM2]

**weights & measures (*pesos y medidas*)** - the system in use in Mexico in the early Republic was one inherited from Spain that largely dated to the late Medieval period. It was very complex and cumbersome, calculations often involved confusing fractions to solve even simple operations. Like other industrialized nations, Mexico began the change to the metric system in the mid-19th century even prior to the short-lived administration of Maximilian (*see also decimal coinage*).

Dry Measure (approximate equivalents):

1 <i>panilla</i>	= 0.25 lbs.
1 <i>marco</i>	= 0.5 lbs.
1 <i>libra</i>	= 1 <u>lb.</u> ( <u>avoir.</u> )
1 <i>arroba</i>	= 25.0 lbs.
1 <i>fanega</i>	= 75.0 lbs.
1 <i>quintal</i>	= 100 lbs.
1 <i>tercio</i>	= 150 lbs.
1 <i>carga</i>	= 300 lbs.

Precious Metals (*post-1731*):

1 <i>libra</i> ( <u>Troy</u> )	= 9216 <i>granos</i>
1 <i>marco</i>	= 4608 <i>granos</i>
1 <i>onza</i>	= 576 <i>granos</i>
1 <i>ochava</i>	= 72 <i>granos</i>
1 <i>adarme</i>	= 36 <i>granos</i>
1 <i>tomín</i>	= 12 <i>granos</i>
1 <i>grano</i>	= 0.282 <u>grams.</u>

Gold (*pre-1731*):

1 <i>libra</i> ( <u>Troy</u> )	= 9600 <i>granos</i>
1 <i>marco</i>	= 4800 <i>granos</i>
1 <i>castellano</i>	= 96 <i>granos</i>
1 <i>tomín</i>	= 12 <i>granos.</i>

Data abstracted from *The Library of Iberian Resources Online*, various sources, 3/2008.