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ABOUT THE COVER: MATHEMATICIANS IN BRONZE

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From Robin Wilson's column in *The Mathematical Intelligencer* [2] we regularly learn about mathematicians who have been immortalized by being pictured on a postage stamp from a country one is often quite unfamiliar with. But we know the mathematician. The stamp is usually on rather fragile paper and, if used and canceled, is really quite delicate. And rarely there are coins that portray the portrait of a mathematician. But a much more robust portrayal of the visage of a mathematician is often to be found on a bronze medal. These are usually issued by an appropriate academy of sciences or sometimes by a university proud of a well-known faculty member they feel needs to be immortalized in bronze. They come in various shapes and sizes as we shall see, but the most dramatic are often heavy, with the portrayal quite three dimensional. And bronze medal sculptors appear to like showing off their dramatic skills as well as their technical ones. The large medals often compete with those of world's fairs or international congresses, as well as centennials, bicentennials, and such. It should be noted that the size of a medal is not necessarily proportional to the influence of the subject's work. The medals shown here are a selection of those in the authors' collections [1].

FIGURE 1. CLEAR COPY OF THE COVER: Pythagoras of Samos
(ca. 570 BC–495 BC)

We know Pythagoras was born on the island of Samos and lived in Egypt for about 22 years. He was taken to Babylon as a prisoner, where he lived for about 12 years before returning to Samos and later moving to Kroton in southern Italy. His contributions to mathematics are not precisely defined. The Pythagorean theorem was known to the Babylonians and Indians centuries before Pythagoras, but it has been suggested by some scholars that Pythagoras or his students may have been the first to prove it. Medalist: Bella Raftopoulou, Greek-French (1902–1992). The medal weighs 9.8 ounces and is 2.7 inches in diameter; see Figure 1.

FIGURE 2. Luca da Pacioli (1445–1514)

Best known for his 1494 book, *Summa*, a collection of mathematical facts known at the time. His portrait was painted by Piero della Francesca, one of the greatest of the painters of the Renaissance. Medalist: Uliana Pernazza, Italian (1959–). The 500 Lira bimetallic coin was issued in 1994, weighs 0.2 ounces and is 1.0 inch in diameter; see Figure 2.

FIGURE 3. Gerhard Mercator (1512–1594)

There were two Mercators, roughly contemporary, but this one is the one known to every school child because the very popular, but highly misleading, map projection of the Earth that is named for him. It is pretty good around the equator but highly distorted near the poles. Medalist: Doris Waschke-Balz, German (1942–). The coin is a 5 Deutsche Mark silver coin issued in 1969 and weighs 0.4 ounces and is 1.16 inches in diameter; see Figure 3.

FIGURE 4. Christian Huygens (1629–1695)

A Dutch mathematician, Huygens contributed an early study of probability, but his most famous contribution was work on a pendulum clock using properties of the cycloid, which could keep time accurately on a ship that was rolling on the high seas. Unfortunately, when this problem was solved, other clocks were introduced that made pendulum clocks obsolete, so its practicality in safely shipping cargoes from Asia to Europe was no longer essential. Nevertheless, it is work still admired for its depth and ingenuity. Medalist: Henrionnet, French (19th century). The medal weighs 1.2 ounces and is 1.64 inches in diameter; see Figure 4.

FIGURE 5. Gottfried Wilhelm Leibniz (1646–1716)

It was in 1684 that Leibniz published his article “Nova Methodus pro Maximis et Minimis” in *Acta Eruditorum*, the first article on the differential calculus. He also designed and built the Stepped Reckoner, a machine that could add, subtract, divide, and multiply. This calculator was based on the Leibniz wheel, a gear mechanism invented by him. A descendant of this device was used in some calculators into the 1970s. This medal was issued by the Soviet Union in 1991. It is of a nickel-brass composition. The medal weighs 0.77 ounces and is 1.58 inches in diameter; see Figure 5.

FIGURE 6. Abraham de Moivre (1667–1754)

He was an active French mathematician but is remembered today mainly for his formula relating two expressions involving trigonometric functions, known to every school child as de Moivre's theorem. Medalist: Joseph Moore, British (1817–1892). The medal weighs 2.6 ounces and is 2.17 inches in diameter; see Figure 6.

FIGURE 7. Augustus de Morgan (1800–1871)

Born in Madras in India, de Morgan went to Trinity College, Cambridge, the standard route for promising young mathematicians in England then as now. But his views of the established church got in the way of his proceeding through the usual fellowships and appointments, so his work took on questions of teaching and exposition, instead of reaching the heights of sophisticated mathematical research. This is also a path known to many promising young mathematicians even today. Medalist: Jean Dassier, Swiss (1676–1763). The medal weighs 1.8 ounces and is 1.86 inches in diameter; see Figure 7.

FIGURE 8. Frigyes Riesz (1880–1950)

A Hungarian mathematician, he had an older brother, Marcel Riesz, who was also an important mathematician of his day. (It should be noted that in the Hungarian language, it is common to write the family name first and the given name following, so one will often see this name in the form Riesz Fryges.) This Riesz was known mainly for his work in functional analysis. The medal weighs 12.2 ounces and is 4.0 inches in diameter; see Figure 8.

FIGURE 9. (Charles) Emile Picard (1856–1941)

Picard was born in Paris, educated at the Lycée Henri IV, and studied mathematics at the École Normale Supérieure. In the 19th century and beyond it was widely rumored that there were two ways a young man could find a good position as a mathematician: publish, publish, publish, or marry the daughter of a senior mathematician. Picard married one of the daughters of Charles Hermite. Medalist: George-Henri Prud'homme, French (1873–1947). The medal weighs 4.4 ounces and is 2.04 inches wide by 2.85 inches high; see Figure 9.

FIGURE 10. Wilhelm Wirtinger (1865–1947)

An Austrian mathematician, Wirtinger worked in a variety of mathematical fields but is perhaps best known for his work in complex analysis, knot theory, and Lie groups. He died in Vienna in 1945, at the end of World War II. Medalist: Josef Tautenhayn, Austrian (1837–1911). The medal weighs 4.2 ounces and is 2.17 inches wide by 2.83 inches high; see Figure 10.

FIGURE 11. (Jean)-Gaston Darboux (1882–1917)

A Frenchman, Darboux was born in Nîmes and was educated at École Normale Supérieure. He worked early on in analysis, in particular in the study of partial differential equations. Medalist: Frédéric-Charles-Victor de Vernon, French (1858–1912). The medal weighs 4.4 ounces, and is 2.1 inches wide by 2.81 inches high; see Figure 11.

REFERENCES

- [1] G. L. Alexanderson and L. F. Klosinski, private collection, 2019.
- [2] R. Wilson, *The Mathematical Intelligencer*, various columns from 1989 to the present.

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