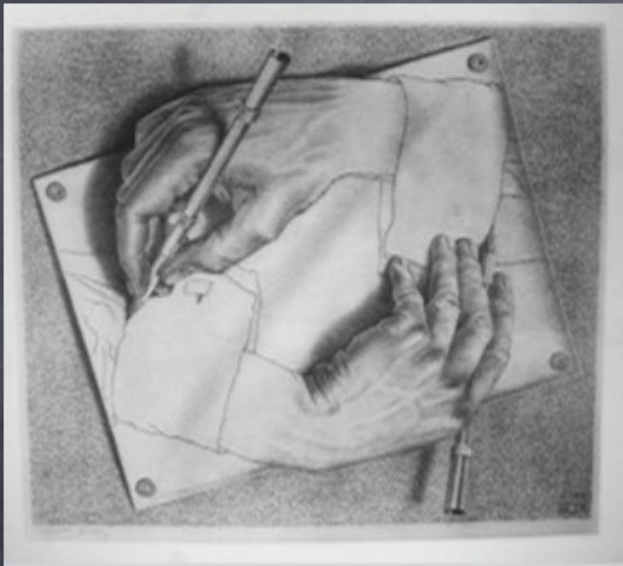


Escher : achever l'inachevable

Christian Côté

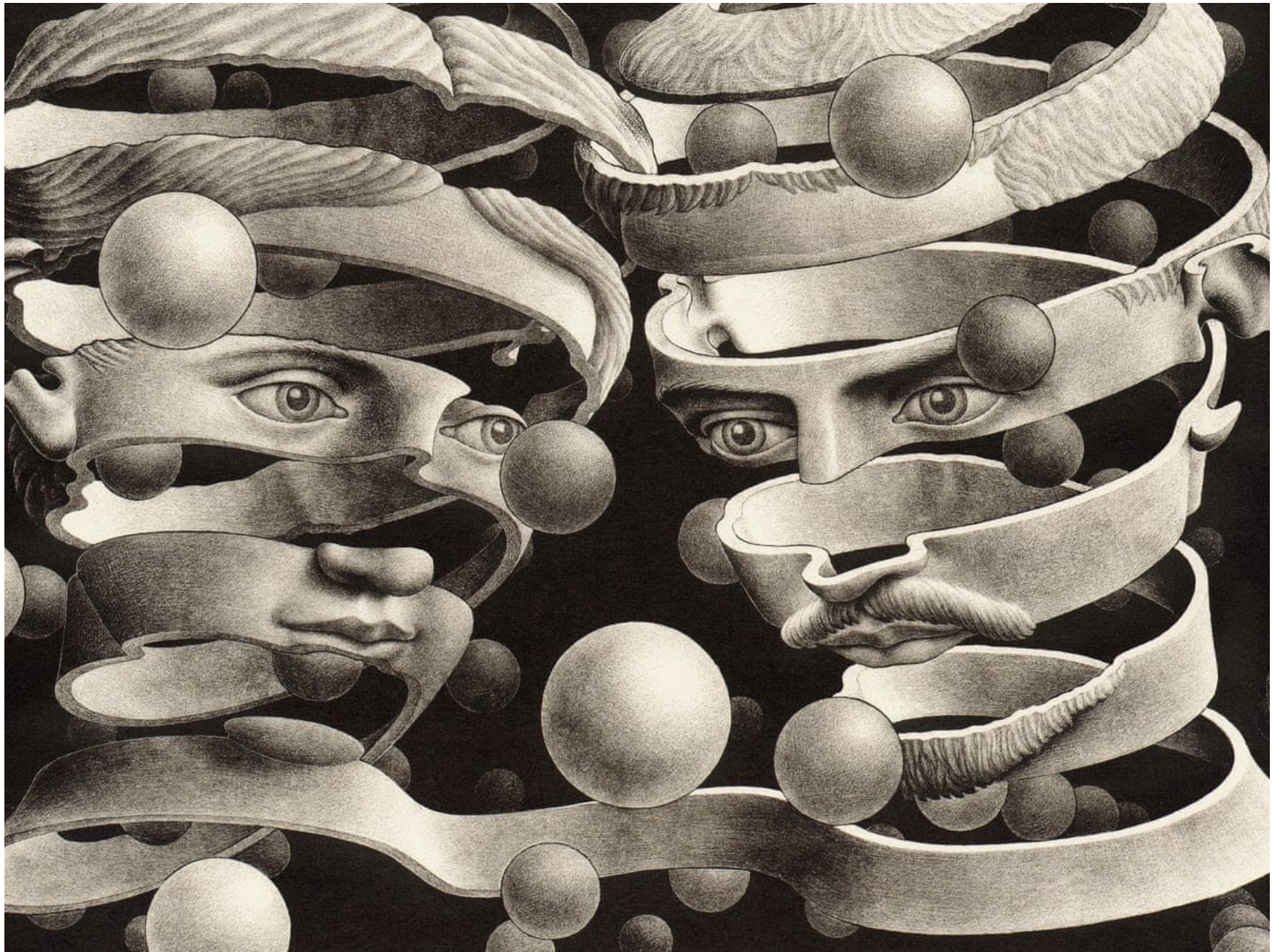
MAURITS CORNELIS ESCHER (1898-1972)

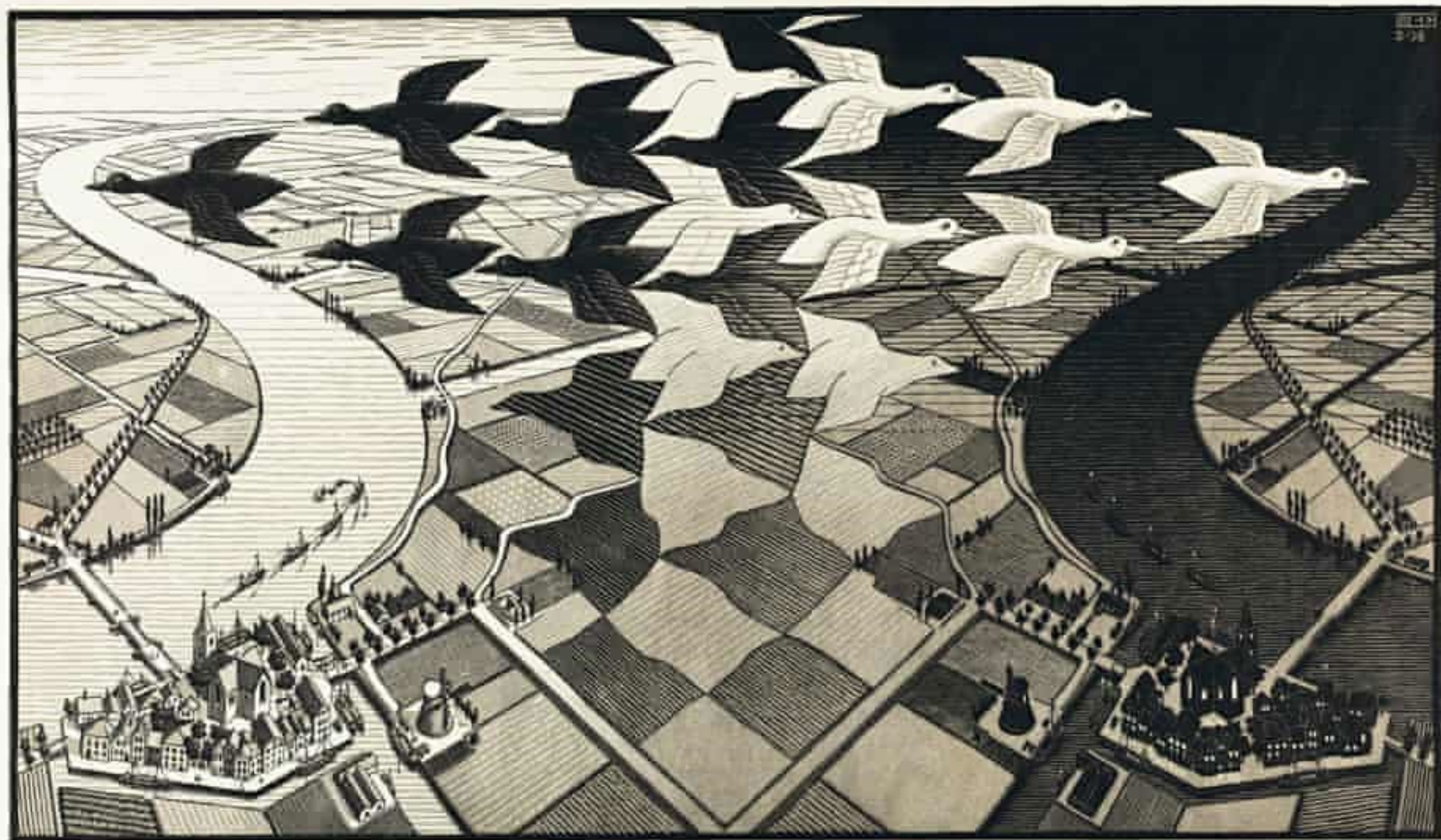


Drawing Hands, 1948



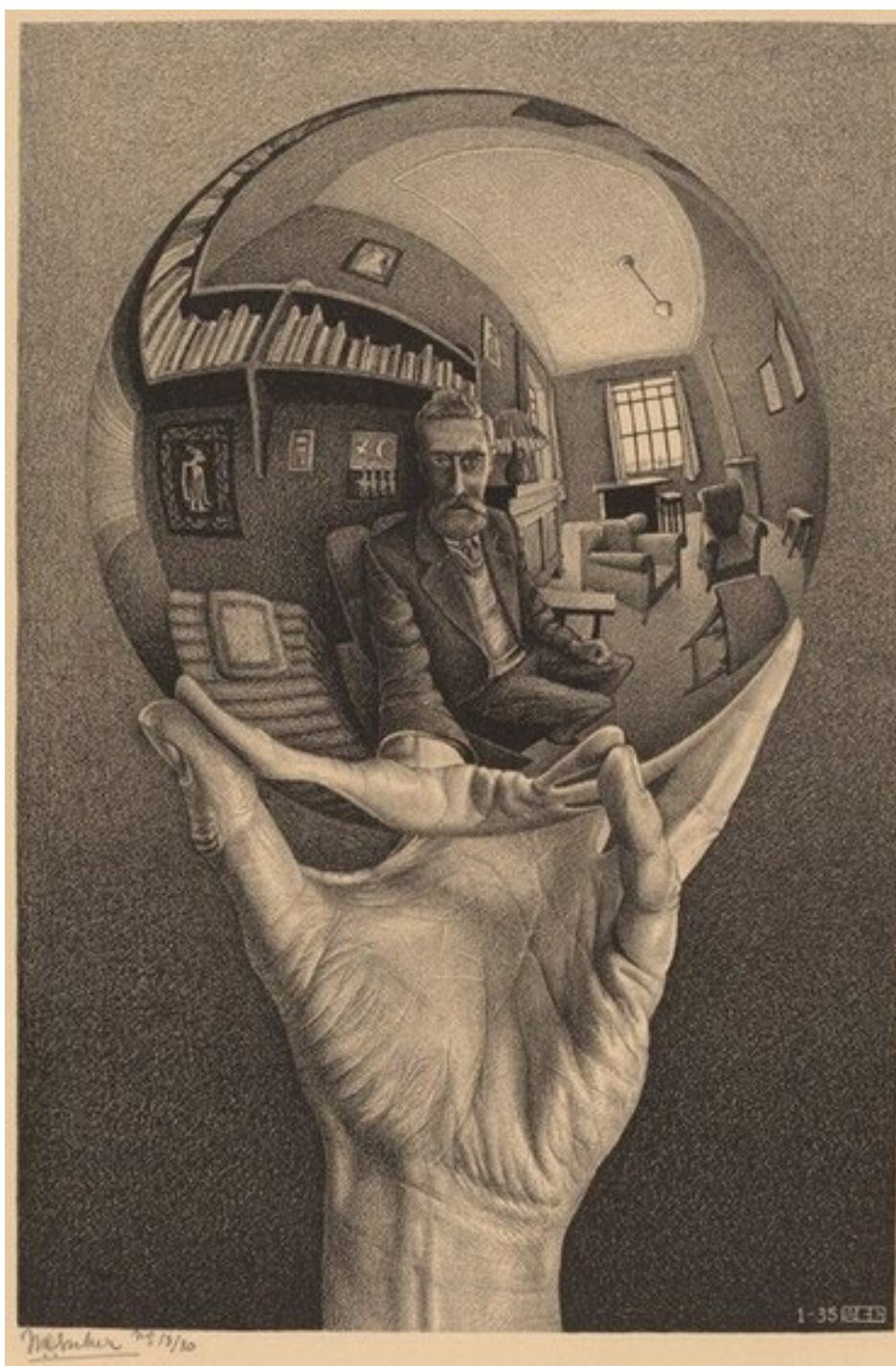
Autoportrait, 1943



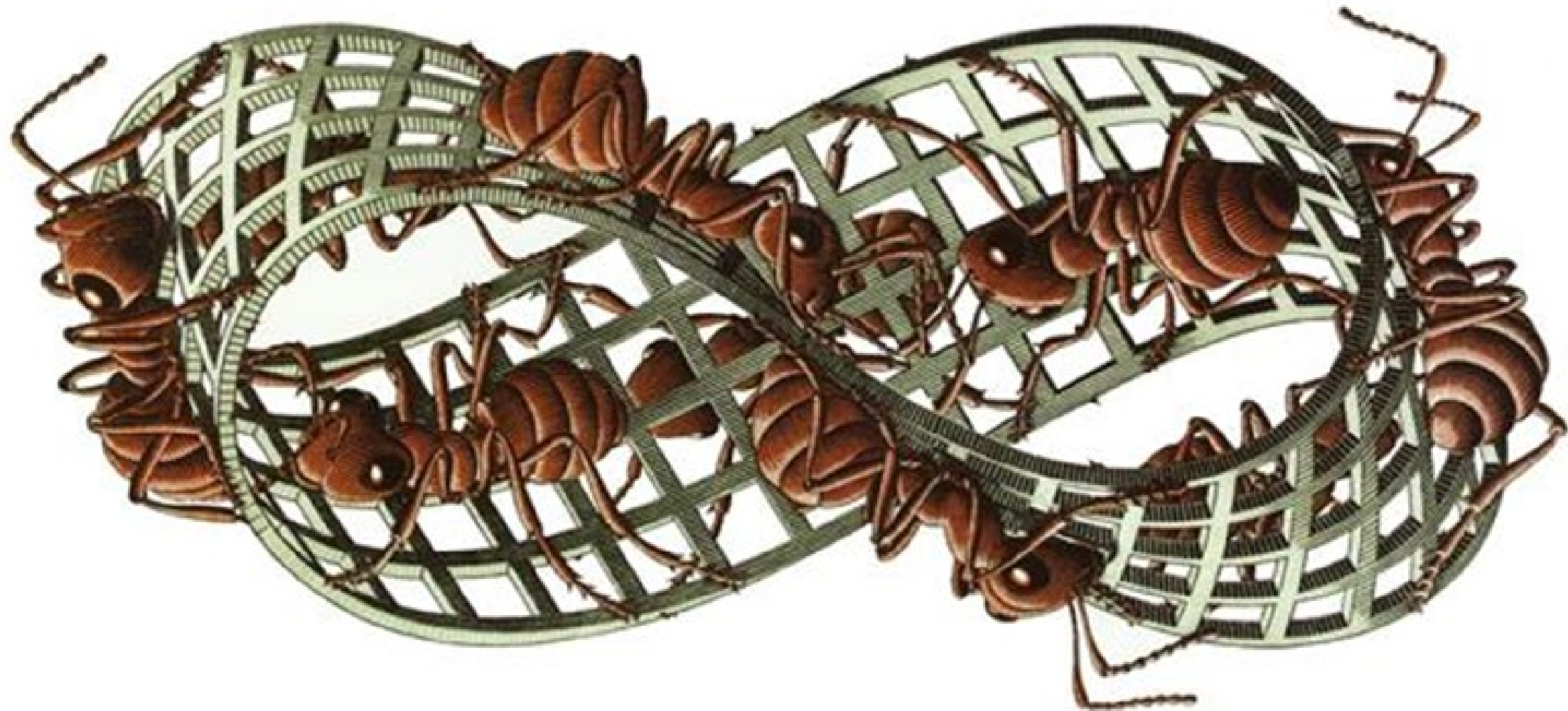


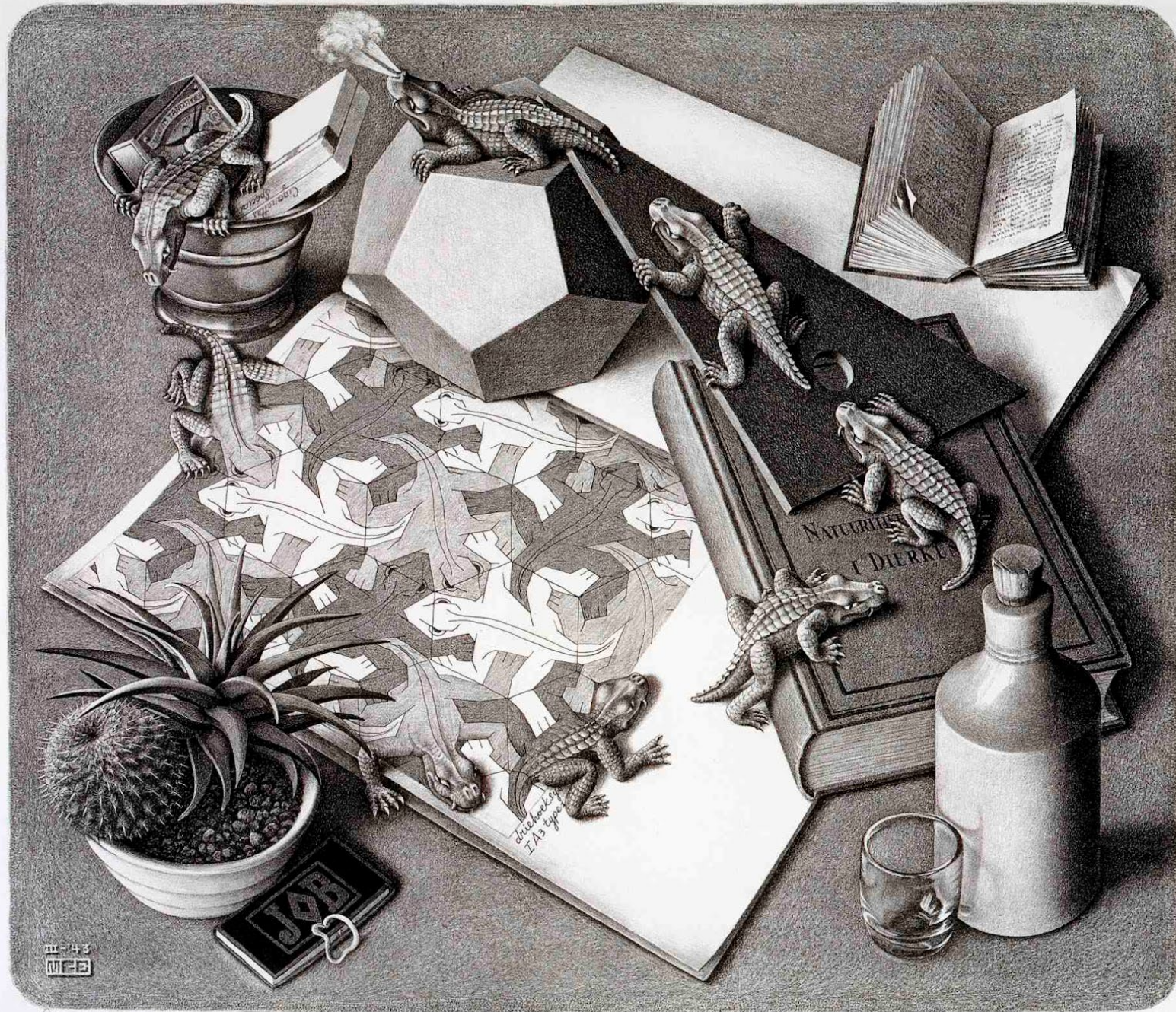






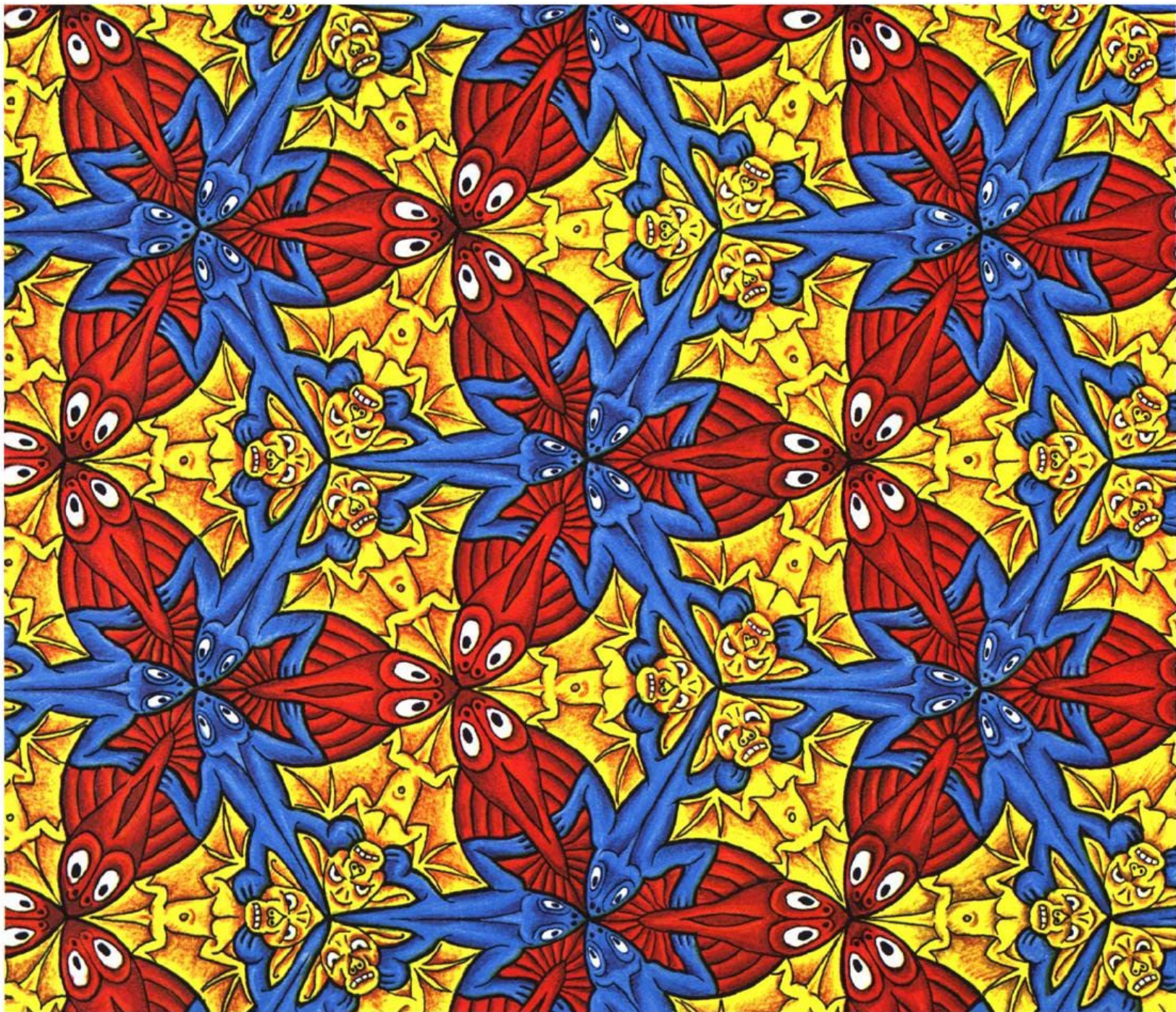






III-43
MFB

MFB 11/12/30



Print gallery

1956



Artful Mathematics: The Heritage of M. C. Escher

Celebrating Mathematics Awareness Month

In recognition of the 2003 Mathematics Awareness Month theme "Mathematics and Art", this article brings together three different pieces about intersections between mathematics and the artwork of M. C. Escher. For more information about Mathematics Awareness Month, visit the website <http://mathforum.org/mam/03/>. The site contains materials for organizing local celebrations of Mathematics Awareness Month.

The Mathematical Structure of Escher's Print Gallery

B. de Smit and H. W. Lenstra Jr.

In 1956 the Dutch graphic artist Maurits Cornelis Escher (1898–1972) made an unusual lithograph with the title *Prententoonstelling*. It shows a young man standing in an exhibition gallery, viewing a print of a Mediterranean seaport. As his eyes follow the quayside buildings shown on the print from left to right and then down, he discovers among them the very same gallery in which he is standing. A circular white patch in the middle of the lithograph contains Escher's monogram and signature.

What is the mathematics behind *Prententoonstelling*? Is there a more satisfactory way of filling in the central white hole? We shall see that the lithograph can be viewed as drawn on a certain elliptic curve over the field of complex numbers and

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Figure 1. Escher's lithograph "Prententoonstelling" (1956).

deduce that an idealized version of the picture repeats itself in the middle. More precisely, it contains a copy of itself, rotated clockwise by $157.6255960832\dots$ degrees and scaled down by a factor of $22.5836845286\dots$.

Escher's Method

The best explanation of how *Prententoonstelling* was made is found in *The Magic Mirror of M. C. Escher* by Bruno Ernst [1], from which the following quotations and all illustrations in this section are taken. Escher started "from the idea that it must...be possible to make an annular bulge," "a cyclic expansion...without beginning or end." The realization of this idea caused him "some almighty headaches." At first, he "tried to put his idea into

Notices

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Hendrik Lenstra





