S. H. Cullinane   **The relativity problem in finite geometry**.   Feb. 20, 1986.

> This is the relativity problem: to fix objectively a class of equivalent coordinatizations and to ascertain the group of transformations S mediating between them.
>
> -- H. Weyl, The Classical Groups,
> Princeton Univ. Pr., 1946, p. 16

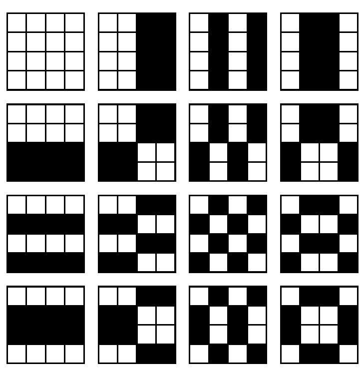
In finite geometry "points" are often defined as ordered n-tuples of a finite (i.e., Galois) field GF(q). What geometric structures ("frames of reference," in Wey's terms) are coordinatized by such n-tuples? Weyl's use of "objectively" seems to mean that such structures should have certain objective -- i.e., purely geometric -- properties invariant under each S.

This note suggests such a frame of reference for the affine 4-space over GF(2), and a class of 322,560 equivalent coordinatizations of the frame.

The frame: A 4x4 array.

The invariant structure:

The following set of 15 partitions of the frame into two 8-sets.



A representative coordinatization:

0000	0001	0010	0011
0100	0101	0110	0111
1000	1001	1010	1011
1100	1101	1110	1111

The group: The group AGL(4,2) of 322,560 regular affine transformations of the ordered 4-tuples over GF(2).