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Arthur Knoebel*, 8412 Cherry Hills Drive, Albuquerque, NM 87111-1027. *Shells*.

A **unitary half-shell** is an algebra A with a binary operation \times and two constants 0 and 1 such that $0 \times a = 0$ and $1 \times a = a$ (plus additional finitary operations if desired). Each kind of factor object — congruence, band, sesquimorphism, element and ideal — is sufficient to capture products. The first four have definitions independent of the others. Any unitary half-shell has Boolean factor congruences; equivalently, any factor congruence is factored by any product. Any unitary half-shell is representable by a sheaf over a Boolean space in which the stalks are nontrivial, and the equalizers are open.

A **unitary shell** also has a binary operation $+$ satisfying $a + 0 = a = 0 + a$. Now factor ideals are independently definable; and factor elements are definable by identities; this explains some traditional definitions of centrality. In any unitary shell, any congruence whatsoever is factored by any product. Again, any unitary shell is representable by a sheaf of nontrivial stalks over a Boolean space.

(A few of these results are old, and are restated here for coherence with the new. Sesquimorphisms were defined in a recent AMS abstract.) (Received August 21, 2007)