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93g:20010 [20C05 \(16S34\)](#)

Scott, L. L. [Scott, Leonard L.] [\(1-VA\)](#)

On a conjecture of Zassenhaus, and beyond.

Proceedings of the International Conference on Algebra, Part 1 (Novosibirsk, 1989), 325–343, *Contemp. Math.*, 131, Part 1, Amer. Math. Soc., Providence, RI, 1992.

Let G and H be finite groups. The isomorphism problem of Graham Higman (1940) asks whether $\mathbf{Z}G \cong \mathbf{Z}H$ implies $G \cong H$. Zassenhaus later conjectured that a stronger result was true: If $\mathbf{Z}G = \mathbf{Z}H$ as rings with augmentation, then G is conjugate to H by a unit in $\mathbf{Q}G$. The original problem remains open, but recently K. W. Roggenkamp and the author [“On a conjecture of Zassenhaus for finite group rings”, Preprint; per revr.] gave a counterexample to the Zassenhaus conjecture. The counterexample was produced by finding a group G for which there exists an augmentation preserving automorphism of $\mathbf{Z}G$ which is not the composition of a group automorphism of G and conjugation by a unit in $\mathbf{Q}G$ which normalizes $\mathbf{Z}G$.

The first part of the present paper discusses the ideas behind the construction of semilocal counterexamples which are then extended to the global case. The second part of the paper summarizes the author’s ideas on what can be salvaged, and about how to get information about the set of all isomorphisms between two group rings from information on some system of group isomorphisms of related groups.

For the entire collection see [MR 93b:00029](#).

Reviewed by [J. D. Dixon](#)

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