B. Aupetit, **Spectrum-preserving linear mappings between Banach algebras or Jordan-Banach algebras**, *J. London Math. Soc.*, (2) 62 (2000), no. 3, 917-924.

Abstract
Spectrum-preserving linear mappings were studied for the first time by G. Frobenius [18]. He proved that a linear mapping Φ from $M_n(C)$ onto $M_n(C)$ which preserves the spectrum has one of the forms $\Phi(x) = axa^{-1}$ or $\Phi(x) = a^t xa^{-1}$, for some invertible matrix a. (Incidentally the hypothesis that Φ is onto is superfluous; see Proposition 2.1(i).) This result was extended by J. Dieudonn [17] supposing Φ onto and satisfying $\operatorname{Sp}\Phi(x) \subset \operatorname{Sp} x$, for every $n \times n$ matrix x.
Several results of M. Nagasawa, S. Banach and M. Stone, R. V. Kadison, A. Gleason and J. P. Kahane and W. Zelazko led I. Kaplansky in [22] to the following problem: given two Banach algebras with unit and Φ a linear mapping from A into B such that $\Phi(1) = 1$ and $\operatorname{Sp}\Phi(x) \subset \operatorname{Sp} x$, for every $x \in A$, is it true that Φ is a Jordan morphism? With this general formulation, this question cannot be true (see [2], p. 28).