On a problem of Nathan Jacobson for Jordan algebras

A classical result proved by H.M. Wedderbun says that if $B$ is an associative algebra with a unitary element, $1$, and $A$ is a finite dimensional central simple subalgebra containing $1$, then $B$ is isomorphic to the Kronecker product $A \otimes S$, where $S$ is a subalgebra of elements of $B$ which commute with every element of $A$. In 1951, I. Kaplansky proved a similar result for a unitary alternative algebra, $B$, and a subalgebra, $A$, of $B$ containing $1$ and having the structure of a split Cayley-Dickson algebra. N. Jacobson, in 1954, also proved a Kronecker factorization theorem for the case when $B$ is a Jordan algebra with $1$, and $A$ is an exceptional simple $27$-dimensional Jordan algebra of Albert. More recently C. Martínez and E. Zelmanov for Jordan superalgebras and V.H. López-Solís and I. Shestakov for alternative algebras have given similar results. In this talk we will explore what happens for Jordan algebras with unitary element having a subalgebra isomorphic to the algebra of the two by two symmetric matrices.