In 1982 Baumgartner and Weese introduced the natural notion of partitioners. Remind that if $F$ is a mad family, then a set $a \subseteq \omega$ is called a partitioner of $F$ iff for all $b \in F$ either $b - a$ or $b \cap a$ is finite. Then, if $B$ is a Boolean algebra and $I$ is an ideal in $B$ generated by $F$ and finite sets, the algebra $B/I$ is called the partition algebra of $F$. If a Boolean algebra is isomorphic to the partition algebra of some mad family, then such an algebra is called to be representable.

In [1] the authors proved several important theorems in this subject, among others they showed that under (CH) each Boolean algebra of cardinality $\leq c$ is representable. They also show that there are algebras which are non-representable in some models.

The authors in [1] also posed a number of problems which were solved later, (see [3]). We will show the solution of Problem 3: Must every representable algebra be embeddable in $P(\omega)/fin$? Among others we will show that there are some models in which $P(\omega_1)$ is embeddable in $P(\omega)/fin$ but not representable, and conversely. The most our unexpected result is that there is a model in which $P(\omega)/fin$ is not representable. During the talk we also present some related results.

This is the joint work with Ryszard Frankiewicz.

