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Orleans, LA 70116, and **Tianna Robinson*** (margolinr@bloomberg.net), McDonogh 35 High
School, 4000 Cadillac St, New Orleans, LA 70116. *The Unknown Subgroup of $W(E_8)$.*

Nearly all the maximal subgroups of $W(E_8)$ have been described—all except $2A_9$. We will provide several descriptions of $2A_9$, and two of them are especially simple: $2A_9$ permutes nine scale copies of E_8 generated by the $9 \cdot 240 = 2160$ norm 4 vectors; and $2A_9$ partitions the 135 isotropic points of $E_8/2E_8$ into nine disjoint isotropic 4-spaces of 15 points each (so the isomorphism $A_8 \cong L_4(2)$ is visible within E_8 .)

Finally, we will describe some of the new combinatorial structure that $2A_9$ brings to E_8 . (Received July 17, 2017)