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We study the structure of the stable coefficients of the Jones polynomial of an alternating link. Explicitly, we identify the first four coefficients with polynomial invariants of a (reduced) Tait graph of the link projection. This motivates us to introduce a polynomial algebra of invariants of planar graphs, prove that it is free, and use a subalgebra of it to construct a plethora of integer-valued invariants of alternating links. We conjecture that all stable coefficients are elements of this algebra, and give experimental evidence for the fifth and sixth stable coefficient. We illustrate our results tables of all alternating links with at most 10 crossings and all irreducible planar graphs with at most 6 vertices. (Received August 10, 2013)