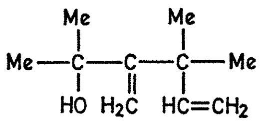
# Synthesis and Structure of Yomogi Alcohol, an Alcohol related to Artemisia Alcohol

By B. WILLHALM and A. F. THOMAS*

(*Research Laboratory, Firmenich et Cie.,* 1211 *Geneva* 8, *Switzerland*)

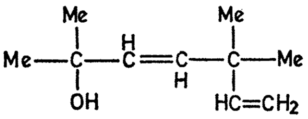
*Summary* Yomogi alcohol has been synthesised and shown to be 2,5,5-trimethylhepta-3-*trans*-6-dien-2-ol, contrary to previous information.

RECENTLY, Hayashi, Yano, and Matsuura[1] isolated a new alcohol from *Artemisia feddei*, Lév. et Van., which they named yomogi alcohol, and to which they attributed structure (**1**). They ascribed a signal in the n.m.r. spectrum at 5·60 p.p.m. to a methylene group on C-3, but we felt that this was at far too low a field for such a group. Such a signal is more characteristic of a 1,2-disubstituted ethylene, –CH=CH–. We therefore synthesized the alcohol (**2**) corresponding to allylically rearranged artemisia alcohol;† this structure fitted the published data for yomogi alcohol better than (**1**).



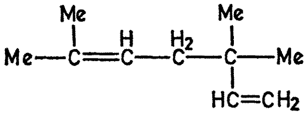
$Me-C(Me)(OH)-C(=CH_2)-C(Me)_2-HC=CH_2$

(**1**)



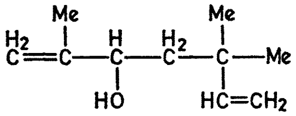
$Me-C(Me)(OH)-CH=CH-C(Me)_2-HC=CH_2$

(**2**)



$Me-C(Me)=CH-CH_2-C(Me)_2-HC=CH_2$

(**3**)



$H_2C=C(Me)-CH(HO)-CH_2-C(Me)_2-HC=CH_2$

(**4**)

The synthesis was effected by a conventional dye-sensitized photo-oxygenation of 3,3,6-trimethylhepta-1,5-diene (**3**),[2,3] leading to a 3 : 1 mixture of the required compound (**2**), and 2,5,5-trimethylhepta-1,6-dien-3-ol (**4**). The i.r. spectrum ($CCl_4$) of synthetic yomogi alcohol has bands at 910 and 972 cm.$^{-1}$ consistent with the presence of a *trans*-substituted ethylene and a vinyl group; there is no band between 660 and 800 cm.$^{-1}$, (spectrum taken neat to avoid the $CCl_4$ absorption) corresponding to a *cis*-substituted ethylene.

Yomogi alcohol is therefore 2,5,5-trimethylhepta-3-*trans*-6-dien-2-ol.

We thank Dr. G. Ohloff for useful discussions.

(*Received, October* 3*rd*, 1969; *Com.* 1495.)

---

† Name derived from "artemisia ketone," (see T. Takemoto and T. Nakajima, *Yakugaku Zasshi*, 1957, **77**, 1307) not to be confused with a more recently described polyacetylene ketone so named (see F. Bohlmann and W. Thefeld, *Chem. Ber.*, 1969, **102**, 1698).

[1] S. Hayashi, K. Yano, and T. Matsuura, *Tetrahedron Letters*, 1968, 6241.
[2] H. Kwart and R. K. Miller, *J. Amer. Chem. Soc.*, 1954, **76**, 5403.
[3] J. E. Baldwin, R. E. Hackler, and D. P. Kelly, *Chem. Comm.*, 1968, 537.