Isolation, Structure, and Partial Synthesis of an Active Constituent of Hashish

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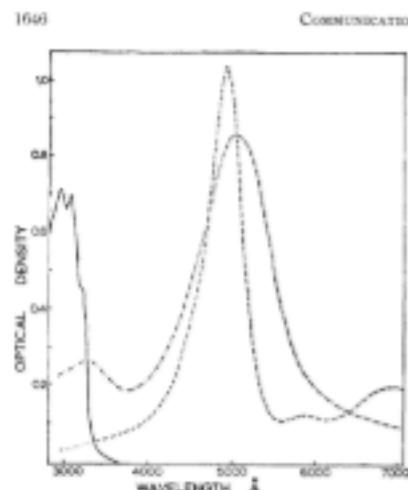
Fig. 1.—Visible and near-ultraviolet spectra of stilbene.

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Sir:

Hashish (marihuana), the psychotomimetically active resin of the female flowering tops of *Cannabis sativa* L. is one of the most widely used illicit narcotic drugs. A number of groups have reported the isolation of active constituents. Most of these substances are not fully characterized, and comparisons with or between them are difficult.

We now wish to report the isolation of an active constituent of hashish to which we assign structure I (Δ^1-3,4-*trans*-tetrahydrocannabinol). This is the first active component whose constitution is fully elucidated.
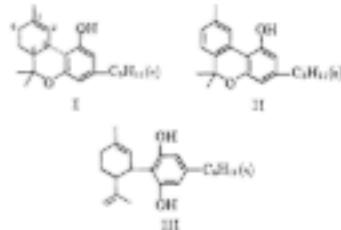
Chromatography of a hexane extract of hashish on Florisil yielded an active fraction, which on repeated chromatography on alumina could be separated into the inactive cannabinol (II) and the tetrahydrocannabinol (I). Further purification of the latter was achieved by the preparation of the crystalline 3,5-dinitrophenylurethane of I [m.p. 115–116°, $[\alpha]^{CHCl_3}_D$ −140°; *Anal.* ($C_{27}H_{30}O_7N_2$). Found: C. 64.17; H. 6.54], followed by mild basic hydrolysis to the pure tetrahydrocannabinol (I) [b.p. 155–157° (0.05 mm.); λ^{EtOH}_{max} 300 mμ (sh) (ε 840), 282 (ε 2075), 278 (ε 2040), $[\alpha]^{CHCl_3}_D$ −150°; *Anal.* ($C_{21}H_{30}O_2$). Found: C. 80.20; H. 9.55]. Purity was established by chromatoplate and by