Synthesis of Prostaglandins $\text{F}_2\alpha$ and $\text{E}_2$

Significance: In 1969, Corey and co-workers reported a landmark total synthesis of prostaglandins $\text{PGF}_{2\alpha}$ and $\text{PGE}_2$ which play an important role as hormones in mammalian tissue. Strategic application of a [2.2.1]-bicycloheptane enabled expedient access to the highly substituted cyclopentane core.

Comment: Bicycloheptane $\text{D}$ was accessed through Diels–Alder reaction between diene $\text{B}$ and $\text{C}$. Subsequent Baeyer–Villiger oxidation followed by hydrolysis and iodolactonization furnished lactone $\text{G}$, which was transformed into the natural products by a sequence involving two olefinations.