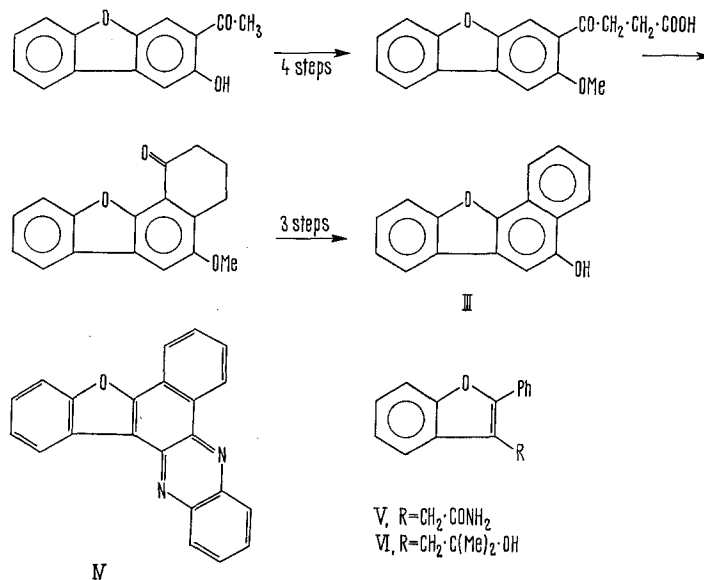


### On 5-Hydroxybenzo[b]naphtho[2,1-d]Furan

In a previous communication<sup>1</sup> we have shown that the product obtained by the acid-catalyzed cyclization of 3-phenylbenzo[b]furan-2-acetic acid may be explained in terms of the cyclobutenone structure (I). A reinvestigation of the related 5-hydroxybenzo[b]naphtho[2,1-d]furan

specimen derived either from  $\alpha$ -brazan<sup>4</sup> or from the cyclobutenone (II) by oxidation with chromic acid. In the latter case, an obvious rearrangement has taken place.

The cyclobutenone on treatment with sodium carbonate gave a mixture of 2-phenylbenzo[b]furan-3-acetic



prepared from 2-phenylbenzo[b]furan-3-acetic acid<sup>2</sup> reveals that the compound is better represented by formula II. Thus the compound shows carbonyl absorption at 1750 cm<sup>-1</sup>, the UV-spectrum in alcohol has a maximum at 244 nm (log  $\epsilon$ , 3.52) and the PMR-spectrum in CDCl<sub>3</sub> shows 9 aromatic protons and one proton at  $\tau$  5.61. The UV-spectrum changed quickly, for reasons given in the sequel, on addition of a drop of alkali.

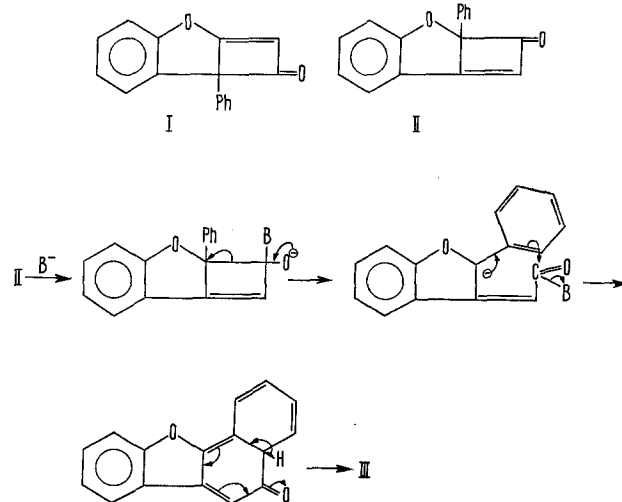
5-Hydroxybenzo[b]naphtho[2,1-d]furan was synthesized from 2-hydroxy-3-acetyldibenzofuran<sup>3</sup> in accordance with the scheme given below:

The phenol, on oxidation with potassium nitrosodisulphonate, gave the related *o*-quinone characterized as the quinoxaline derivative (IV) identical with an authentic

acid and the naphthol (III) and similarly, with ammonia, gave mainly 2-phenylbenzo[b]furan-3-acetamide (V). With methyl magnesium iodide (II) gave a mixture of (III) and the tertiary alcohol (VI). The cyclobutenone obviously undergoes a facile base-catalyzed rearrangement. Thermal rearrangement of 1,1-diphenyl-2-alkoxy-3-alkyl-cyclobut-2-en-4-ones to respective  $\alpha$ -naphthols have however been noted earlier<sup>5</sup>. The mechanism given below appears possible.

*Zusammenfassung.* Für die früher als 5-Hydroxybenzo[b]naphtho[2,1-d]furan beschriebene Verbindung wird die Struktur II vorgeschlagen und eine Synthese des ersteren (III) beschrieben.

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<sup>1</sup> J. N. CHATTERJEA and S. SRIVASTAVA, *Tetrahedron Lett.* 395 (1970).

<sup>2</sup> J. N. CHATTERJEA, *Experientia* 12, 18 (1956); *J. Indian chem. Soc.* 33, 447 (1956).

<sup>3</sup> H. GILMAN, T. H. COOK and R. G. JOHNSON, *J. Am. chem. Soc.* 76, 5783 (1954).

<sup>4</sup> O. KRUBER and R. OBERKOBUSCH, *Chem. Ber.* 84, 831 (1951).

<sup>5</sup> J. F. ARENS, *Advances in Organic Chemistry, Methods and Results* (Eds. RAPHAEL, TAYLOR and WYNBERG; Interscience Publishers, Inc., New York 1960), vol. 2, p. 117.