

phase of an organism in a nutrient medium while it is little or negligible on 'resting' organisms in non-nutrient fluids. In the vaccine lymph the organisms are in 'resting' phase in a non-nutrient medium and it is not strange that penicillin does not bring about any bacterial reduction in vaccine lymph.

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SYNTHESIS OF YOHIMBINE AND RELATED RING STRUCTURES

THE recent publication by Swan¹ reporting the unsuccessful attempt to ring close 3-(2'-O-Hydroxymethyl-phenylacetamido-ethyl)-indole by heating under reflux for an hour, in an indifferent atmosphere, with phosphoryl chloride makes it necessary for us to publish this note. For some time past, one of us (Dr. K. N. Menon) has been carrying out a number of experiments to synthesise various members of the iso-quinoline and indole groups employing oxygen-alkyl substituted iso-chroman-3-one as the condensing unit. The successful development of the method has much interest in the direction of biogenesis of plant alkaloids according to Sir Robert Robinson's² classical theory. A large number of β -phenyl-ethylamines and iso-chroman-3-ones have been condensed and ring closed. The very heavy teaching duties of Dr. Menon has prevented more rapid progress and it is hoped grace time will be allowed to enable this laboratory to complete this work. In connection with this general scheme, synthesis in the Yohimbine group was taken up and as we had accumulated 3:4-methylene-dioxy-iso-chroman-3-one, we condensed this with tryptamine. The resulting amide gave no concrete result on treatment with phosphoryl chloride or phosphorous trichloride using benzene and its homologues as the solvent. Resinification under the action of hydrogen chloride seems to be the difficulty in this method. Using phosphorous pentoxide has given us positive results and we propose to submit the product obtained to very rigid examination before communicating the full account of this work.

The work of Jost,³ of Karrer and Enslin⁴ on corynanthein and Woodward and Mc-

Lamore's⁵ on the synthesis of sempervirine metho-salts by an elegantly unambiguous route, makes progress on the synthetical work we have undertaken of great interest.

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October 15, 1949.

1. *J. C. S.*, 1949, 1720. 2. *Ibid.*, 1917, 111, 876; 1931, 3163; 1932, 789; 1933, 280; 1936, 1079.
3. *Helv. Chem. Acta.*, 1949, 32, 1297. 4. *Ibid.*, 1949, 32, 1390. 5. *J. A. C. S.*, 1949, 71, 379.

NOTE "ON A CERTAIN DISTRIBUTION IN THE THEORY OF SAMPLING"

It is claimed that the distribution function of the variate

$$\xi = \frac{a_1 m_1 + a_2 m_2 + \dots + a_i m_i}{\sqrt{\{n_1 s_1^2 + \dots + n_i s_i^2\}}}$$

has been derived¹ without any restrictions on the constants a_i and that Simpson's theorem² is deducible from it as a special case.

Here, i = number of the samples drawn
 n_i = size of i th sample
 m_i = mean of i th sample
 s_i^2 = variance of i th sample
 a_i = constants.

The results and the proof given by the author are not new. Kempthorne³ has pointed out that even Simpson's theorem is not new though the proof is interesting. Distributions of $\sum a_i m_i$, $\sqrt{\sum n_i s_i^2}$ and their ratio are available in some of the text-books on Advanced Statistics.^{4,5}

Mysore,
July 15, 1949.

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1. Krishna Sastry, K. V., "On a certain distribution in the Theory of Sampling," *Nat. Inst. Sci. Ind.*, 12, 8, 427-28. 2. Simpson, Harold, "On a theorem concerning sampling," *J. R. S. S.*, 1943, 36, 266. 3. O. Kempthorne, "Comments on the previous note," *ibid.*, 1944, 58. 4. Cramer, "Random variables and Probability Distributions", *Cambridge Tracts in Mathematics and Physics*, 1937, 36, 48. 5. Kendal, *Advanced Statistics*, 1945, 1, Ex. 10-11, 253.