

of flowers per acre, and some of the individual bushes did yield 500 flower heads.

8. The flowers were sent for trial purposes to The Malarial Institute of India, who have found the specimen equivalent to the Kenya ones in biological test. It is said to have contained about 1 per cent. pyrethrin.

9. The vitality of the seed has not been affected by storage for one complete year so far.

Other cultural experiments including manuring under irrigated and unirrigated conditions in different classes of soils have been started at about a dozen centres. It is expected that the cultivation of pyrethrum

will be started on a very large scale during the coming season.

The Forest Department had taken up the cultivation earlier and this year they have brought an area of about 200 acres under this crop.

Small samples of five other varieties namely *P. roseum*; *P. parthenium*; *P. cineraria*; *P. carneum*; *P. lencopiloides* have also been received from The Imperial Council of Agricultural Research. Out of these only two, i.e., *Pyrethrum roseum* and *Pyrethrum parthenium*, succeeded well. As a plant, none of these can compare well with *Pyrethrum cinerariæfolium*. Samples of flowers are collected and will be sent for biological test.

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## OBITUARY

THE HON'BLE SIR ALFRED GIBBS BOURNE, K.C.I.E., D.Sc., F.R.S., F.L.S.  
(1859-1940)

MANY of the old students of Sir Alfred Bourne will doubtless grieve to hear of the sad news that he passed away. He was comparatively young when, in 1886, he arrived in Madras to join the Presidency College as Professor of Biology which he held till 1898. During this period, however, he acted on several occasions as Registrar of the Madras University and as Superintendent, Government Museum. On relinquishing the professorial chair in 1903 he was made Director of Public Instruction and Commissioner for Government Examinations, with provision for a seat in the Legislative Council. He retired from this office in 1914.

Sir Alfred Bourne established a great reputation both as a teacher and as an investigator. Before he landed in India, he had published important memoirs on zoological subjects and his brilliant work in India enabled him at an early age to be elected into the Royal Society. His many students will remember that though he was a man of few words there beat within him a true human heart, and in the spirit of a loving teacher he exerted his influence to

advance their interests. In his capacity as Director of Public Instruction his constant endeavour had been to expand secondary education to which modern sides were added. He introduced the Secondary School Leaving Certificate system. As Chairman of the first university inspecting commission his report is a document of great importance and lucidity and some of the recent reforms in the university education can be traced to his labours.

After retiring he was summoned to assume charge of the Indian Institute of Science as its Director, which post he held with conspicuous distinction from October 1915 to March 1921.

Sir Alfred Bourne may not have come into personal contact with a very large body of students in South India. But nevertheless, the few that came under his direct influence will remember the many excellent qualities of that brilliant scientist who commanded a raging popularity and widespread esteem. His name and work in Madras will be remembered for a long time in grateful appreciation.

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## LETTERS TO THE EDITOR

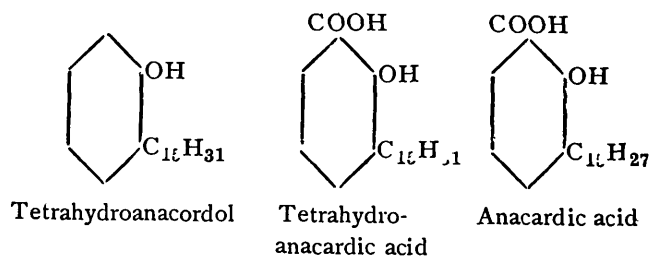
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### The Constitution of Anacardic Acid, the Principal Constituent of Cashew-Nut Shell Oil

CASHEW-NUT shell oil from the pericarp of the seed of cashew-nut tree—*Anacardium occidentale*—is an article of great commercial value. A small part of the oil produced in India is used locally as a preservative coating for country boats, wooden floors, and fishing nets, major portion being exported to America for the manufacture of insulating varnishes, lubricating oils, synthetic resins, etc.

Stadeler<sup>1</sup> who first studied the chemical composition of this oil, separated the acid constituent called "Anacardic Acid" and the neutral one, "Cordol". Ruheman and Skinner<sup>2</sup> later established the correct molecular formulæ of anacardic acid as  $C_{22}H_{32}O_3$ . Smit<sup>3</sup> suggested that anacardic acid is a penta-deca-dienyl-salicylic acid  $C_6H_4.OH.CO_2H.C_{15}H_{27}$ . On catalytic hydrogenation of anacardic acid he obtained tetrahydroanacardic acid from which by decarboxylation, tetrahydroanacordol was obtained. The

presence of a hydroxyl group and a pentadecyl side chain was established by him, but the ortho-position of the pentadecyl side chain to the hydroxyl group was suggested by him by mere analogy with pelandjaucic acid.<sup>4</sup> According to him, therefore, the following are the structures of tetrahydroanacordol, tetrahydroanacardic acid and anacardic acid.



Later P. P. Pillay<sup>5</sup> also studied the constitution of anacardic acid and obtained results similar to those of Smit's. Further he claims to have isolated salicylic acid as a product of potash fusion of phenol obtained by destructive distillation of anacardic acid and hence he has also assigned the alkyl chain an ortho-position to hydroxyl group. This evidence appears to be of doubtful nature as under the drastic