

affect the manufacture of good white sugar from the canes grown on the older sewage farms as well.

The above observations indicate that sewage may be hygienically and economically utilised for the cultivation of sugarcane. Such a development would, apart from meeting to a considerable extent the present sugar shortage in the country, also help to utilise the valuable fertilising ingredients which are now largely going to waste.

Further studies in regard to the selection of the best varieties of cane for sewage farming and other aspects are in progress.

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### COLOURING MATTER OF THE FLOWERS OF *HIBISCUS ESCULANTUS*

SINCE the study of the colouring matter of a number of flowers belonging to the family Malvaceæ has yielded interesting results in the chemistry of the flavonols, the flower petals of *Hibiscus esculantus* have now been examined. This plant is cultivated throughout India and in all tropical countries as a vegetable. One of the varieties of the flowers are yellow with purple eye spots in the centre.

About a pound of dry flower petals, from a vegetable farm near Madras, was extracted three times with boiling methylated spirit, each extraction taking 6 hours. The solvent was distilled off on a water-bath, and the viscous brown concentrate treated with an equal volume of ether and allowed to stand in the ice-chest for 4 days. A considerable amount of yellowish brown solid separated. The ether layer was poured out and the solid filtered and washed with alcohol. A little more of it separated from the aqueous filtrate on further standing for a few days. The crude product weighed 2 grams. After repeated crystallisation from dilute alcohol it was obtained in the form of bright yellow narrow rectangular plates melting with decomposition at 230°-320° C. It was readily soluble in water giving an yellow solution, but sparingly soluble in alcohol and

other organic solvents. It gave a dark olive green colour with ferric chloride and a red precipitate with neutral lead acetate. Its solutions in dilute alkali and in alkaline buffers were yellow and did not exhibit any rapid change of colour. It was unaffected by *p*-benzoquinone in alcoholic solution.

The substance was glucosidic in nature, and on hydrolysis by boiling with 7 per cent. sulphuric acid yielded glucose and a bright yellow aglucone crystallising from alcohol as prisms and melting with decomposition at about 310°. Its colour reactions with alkaline buffer solutions were characteristic of gossypetin—yellow green blue, and finally fading. Its identity with gossypetin was confirmed by direct comparison and also by preparing the acetyl derivative, m.p. 226°-28° C., and determining the mixed melting point with an authentic sample.

The original colouring matter is, therefore, a glucoside of gossypetin, and all its reactions agreed with the rare 8-glucoside, gossypin.<sup>1,2</sup> This was established by direct comparison and determination of the mixed melting point. It was first isolated from the flower petals of *Gossypium indicum*<sup>3</sup> but this is a poor and unreliable source. More recently the flowers of *Hibiscus vitifolius*<sup>4</sup> were found to contain it in quantity. *H. esculantus* forms a third source though not so rich. Thus gossypin is more widely occurring in nature than originally expected.

The ether solution and the aqueous mother-liquor were examined for the possible presence of other components, but none could be isolated.

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### MERCUROCHROME AS AN INDICATOR IN HALOGEN AND SILVER ION TITRATIONS

In continuation of the study of mercurochrome (disodium-dibromo-hydroxy mercury fluorescein) as an indicator<sup>1</sup> the present investigation was undertaken. Standard solutions (M/20) of potassium chloride, potassium bromide, potassium iodide, and silver nitrate were employed, one per cent. aqueous solution of mercurochrome being used as indicator. Finally the readings were compared with those obtained when potassium chromate was used as an indicator in accordance with the known standard methods.

To 10 c.c. of a halide solution a couple of drops of the present indicator were added. As the silver nitrate solution was run in, a whitish turbidity occurred, which changed to pink. This change of colour was sharp only in the case of potassium iodide (and not so marked in the other two cases), marking the end point. The following modification im-