

halved when h is odd and (hko) are halved when k is odd, and that the crystals belong to the space group Q_h^{11} . The number of asymmetric molecules required by the space group is eight while that calculated from the above dimensions of the unit cell and the density of the crystals, which was found to be 1.05, is four. This indicates that the molecules possess an element of symmetry which may be a centre of symmetry, or a dyad axis perpendicular to (001) or a plane parallel to (100). Further work on the complete elucidation of the structure is being undertaken.

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October 1934.

Vitamin C in Indian Food-Stuffs.

WE have lately been engaged in a systematic investigation of the ascorbic acid contents of various Indian food-stuffs, especially fruits, by the technique of Harris and Ray,¹ slightly modified by the introduction of glacial acetic acid to the solution of 2:6-dichlorophenol-indophenol before titration against the trichloroacetic acid extracts of the food-stuffs.² Figures are given below in mg. ascorbic acid per gramme of the fresh edible material. More than 30 food-stuffs have thus been studied, and, of these, the guava, the mango (*langra* variety) and the lichi appear to be the richest sources, containing 1.04, 0.69 and 0.48 mg. ascorbic acid respectively. The different varieties of the mango, *deshi*, *fozli* and *langra*, differ markedly in their ascorbic acid contents, containing 0.22, 0.1 and 0.34 mg. ascorbic acid (see also Guha and Chakravorty³).

The ascorbic acid content of *kancha-mung* (*Phaseolus mungo*) is increased 7.8 times by germination, calculated on the basis of dry weight. Parallel estimations by biological and chemical methods indicate that trichloroacetic acid does not completely extract

the Vitamin C of germinated *mung* (see also Johnson⁴).

The mango (*deshi* variety, obtained from a particular tree) has been found to contain 0.1, 0.05 and 0.2 mg. ascorbic acid at the bud, green and ripe stages respectively. The values for the guava obtained from one tree at the bud and green stages of development are 0.41 and 0.28 respectively. It would seem, therefore, that the process of development of these fruits, unlike that of germination of the seed, involves a progressive reduction in the ascorbic acid content.

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A Note on the Changes in the Physical and Chemical Characteristics of the Blood Sera of Opium Addicts.

INITIATION into the opium habit is generally found to take place with a view to relieve some mental or physical pains and also certain other ailments such as diarrhoea, etc. In such cases of physical troubles people really find some relief, specially in the beginning, but this gradually develops into a habit which it is difficult to get rid of. The symptoms attending the withdrawal of the habit are extremely painful since it sometimes ends in complete breakdown or even collapse on the part of the addict. Pierce and Plant's observations¹ on the dilution of blood on addiction as well as Barbour, Hunter and Richey's corroborating observations² from a study of the specific gravity of the whole blood serve as clues to some real changes in the blood of the addicts. Henderson and Haggard's³ observation on the increase of carbon dioxide tension is also very interesting from this point of view. The disturbance in the water-balance of the system consequent upon the withdrawal of the habit has been regarded by Rowntree as a condition somewhat allied to water poisoning. From these

¹ Cf. Astbury and Yardley, *Phil. Trans.*, 1924, 224, 221.

² Harris and Ray, *Biochem. J.*, 1933, 27, 303.

³ Guha and Ghosh, *Curr. Sci.*, 1934, 2, 390.

⁴ Guha and Chakravorty, *Ind. J. Med. Res.*, 1933, 20, 1045.

⁴ Johnson, *Biochem. J.*, 1933, 27, 1942.

¹ *J. Pharmacol. and Exp. Therap.*, 1928, 33, 359.

² *Ibid.*, 1929, 36, 251.

³ *J. Biol. Chem.*, 1916, 33, 333.

considerations the present work was undertaken with a view to find out any changes in physico-chemical properties or in the protein fraction of the blood sera of the opium addicts as commonly found in India, since physico-chemical properties and proteins are known to be responsible for many apparent changes of the blood.

From a study of 25 opium addicts the following observations were made. The pH in all the cases is found to be near the lower limit of the normal Indian subjects while the buffer action seems to be considerably lowered. These facts are most probably the necessary outcome of the increased carbon dioxide tension and diminished alkaline reserve as observed by various workers (Henderson and Haggard,⁴ Cobet,⁵ and Barbour, Hunter and Richey⁶). The diminished viscosity and an increased surface tension of the blood sera point to an increase in the fluid content while the slight increase in viscosity of the whole blood which corroborates similar observations of Sollier⁷ may be due to a change in the fluid content of the red cells. As to the protein changes in the blood sera, the albumin fraction which has been found to increase above its normal value is probably responsible for the disturbance in the water balance which was up till now supposed to be due to a variety of causes, like disturbances in fat metabolism, etc. Another important observation is the increase in the euglobulin content of the sera which probably accounts for the nervous symptoms owing to a drainage of lecithin from the nerve cells to form an increased amount of euglobulin as observed in these cases. The pseudoglobulin and the total proteins have been found to decrease below their normal values, the former to a greater extent than the latter. These protein changes appear to be of considerable interest from the point of view of the reshuffling of the lecithin distribution. The field work done in this direction corroborates these observations inasmuch as diets rich in phosphates are found to annul the physical and mental degenerations to a very great extent.

Further work along this direction is in progress specially with respect to the fat metabolism in the system of the addicts,

⁴ *Loc. cit.*

⁵ *Biochem. J.*, 1923, 2, 137, 67.

⁶ *Loc. cit.*

⁷ *J. d. med. d.*, Paris, 30, 875.

since fat is known to have important effect upon the water retention in the system and being itself the glyceryl ester of fatty acids is closely related to the glycerophosphates on whose metabolism it exerts an influence. These findings may possibly have some important bearing upon the pathology and treatment of opium habitues.

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October 19, 1934.

Apple Rot caused by *Fusarium moniliforme* Sheldon.

THE writer collected a number of *Fusaria* growing saprophytically. Amongst these *F. viride* (Lechm.) Wr. re-named as *F. solani* var. *medium* Wr. proved to be a new wound parasite of potato tubers.¹ Bacteria-free, single-spore cultures of another species, viz., *F. moniliforme* Sheldon, kindly identified by Dr. Wollenweber, were inoculated into both the "hill" and the "Kashmir" varieties of apples. The "Kashmir" apple differs from the other in being elongated in the vertical or blossom axis, sweeter, less acidic and brighter in colour. Inoculations were made by the method devised by Granger and Horne² and used by Mitter and Tandon,³ with a minor change in the substitution



Fig. 1.

of a straight needle in place of the usual hooked one. The inoculated apples as well as the controls were left undisturbed for 35 days at room temperature (19.5°–22.8°C.). Both the varieties of apples were infected (Fig. 1) and the average damage done was 22.01%. *F. moniliforme* was re-isolated in a pure form from the diseased parts of each apple while the controls remained healthy. As far as the author is able to ascertain there has been no previous record of *F. moniliforme* Sheldon as showing any parasitic activity on apples. *F. camptoceras*, *F. semitectum*, *F. semitectum* var. *majus* and *F. diversisporum*

¹ Mitra, Anil, *Nature*, 1934, 133, 67.

² Granger and Horne, *Ann. Bot.*, 1924, 38, 212.

³ Mitter and Tandon, *Jour. Ind. Bot. Soc.*, 1929, 8, 212.