Fukushi[2] recorded a mosaic of *Crotalaria juncea* from Japan; since no experimental work was done by Fukushi it is difficult to state if the virus occurring in India is the same as that in Japan.

The virus was purified according to the method suggested by Bawden[3] with acid and ammonium sulphate. A white pericipitate was formed at the bottom of the centrifuge tube after the preparation was centrifuged. The precipitate was repeatedly washed with water; at pH 3·3 the virus went into solution. The preparation was centrifuged at 3,000 r.p.m. in an 'Ecco' Laboratory Centrifuge; no impurity in the form of a precipitate was observed after this centrifugation. The virus was precipitated from the preparation after adjusting the pH to 4·2 by the addition of N/10 NaOH. The suspension was centrifuged; the precipitate was dissolved in NaOH and the pH was raised to 7·0. This solution was finally centrifuged at 3,000 r.p.m. for one hour. A colourless solution of the purified virus was thus obtained.

The preparation was later centrifuged for two hours in a centrifugal field of nearly 12,000 times gravity. A white jelly-like material accumulated at the bottom of the centrifuge tube (Fig. 4). This jelly-like material was dissolved in water and centrifuged again for one hour at 3,500 r.p.m. A glassy crystalline mass accumulated at the bottom of the centrifuge tube. The supernatant was poured off and discarded. A few drops of distilled water were added to the crystalline mass and the preparation was poured off in a beaker which was kept at 20° C. for 4-5 hours to allow evaporation of water. Very fine glassy acicular crystals were formed on the surface of the beaker (Fig. 5).

The expressed sap collected from leaves of healthy sann-hemp plants was subjected to a similar treatment with acid and ammonium sulphate, and centrifugation, as a blank experiment. No jelly-like material or crystals as obtained from the diseased leaves of sann-hemp plants could be isolated; this clearly indicates that they are not a normal constituent of sann-hemp plants, nor was it produced from the reagents used.

A solution of the purified crystalline preparation gave positive results in inoculation tests on sann-hemp plants and produced typical symptoms of the disease.

Further studies are in progress.

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Plant Pathology, S. P. RAYCHAUDHURI.
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November 18, 1946.

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SOME FACTORS AFFECTING THE REFRACTIVE INDEX AND CONSTANT OF MILK

THE refractive index and refractive constant, K, of milk[1,2] having been recently devised, a number of routine environmental factors that might affect their values were investigated.

The high values of R.I. and K of colostrum (cow, R.I., 1·3513, K, 0·2111; buffalo, R.I., 1·3630, K, 0·2134) reach normal levels in three to seven days after parturition, K being the earlier of the two.

The constants vary, within normal limits, from milking to milking and from day to day. The order of variation, however, appears to be unpredictable.

Within normal limits, appreciable differences also exist between the constants of milk from different quarters of the udder. Different portions of a milking, however, exhibit a more or less uniform value of R.I. and a steady rise in the value of K resulting from the progressive fall in density from fore milk to strippings. In all cases the constants of pooled milk lie within normal limits.

A marked effect of change of season on the R.I. of milk is also noticeable. With the change over from dry summer months to rainy season when lush vegetation is available for cattle there is a distinct upward shift of the limits of R.I. as seen in the following table. The limits of K, on the other hand, remain practically the same because of the more or less corresponding rise in density of milk in the rainy months.

TABLE

Limits of R.I. and K in dry and rainy seasons of the year

	Dry season		Rainy season	
	R.I.	K.	R.I.	K.
Cow ..	1·3460 to 1·3470	0·2061 to 0·2075	1·3458 to 1·3480	0·2065 to 0·2076
Buffalo ..	1·3460 to 1·3492	0·2076 to 0·2088	1·3470 to 1·3570	0·2076 to 0·2088

Rigorous heat treatment of milk like boiling for 5 and 10 minutes causes a progressive rise in the values of R.I. and K depending on loss in volume and rise in concentration of milk solids.

In general it is observed that R.I. of milk is affected by factors which affect variations in the solids-not-fat of milk. The refractive constant, however, remains within narrow limits unaffected by many of the natural factors.

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INITIATION OF LACTATION IN HEIFERS AND COWS

FOLLEY, *et al.* (1941) were successful in initiating lactation in virgin goats by rubbing diethylstilbesterol ointment on the udder. Similar results were obtained by Folley and Malpress (1944) in the case of heifers.

Two barren heifers and one dairy cow were treated with stilbesterol-dipropionate dissolved in oil. To start with all the three animals were injected 2 ml. (containing 20 mg. of stilbesterol-dipropionate) of the oestrogen. Two more injections were subsequently given.

The heifer No. 314 showed mammary development within a week. The little milk that was secreted was mixed with some blood. Intense manipulation of the udder was started and after about a week the animal's milk yield increased to 2 lbs. After a fortnight the milk became normal in appearance. The milk yield had gone up to 15 lbs. per day in 90 days after the milking was first started.

The heifer No. 445 began secreting milk about a week after the second injection and cow No. 332 came in milk a week after the first injection of stilbesterol-dipropionate.

Details of the milk yield and composition of milk are shown in the table. At the start of the lactation the milk obtained closely resembled normal milk rather than colostrum. The total proteins, solids-not-fat and chlorine were rather high and lactose percentage low compared to normal milk. The composition became almost normal after about three weeks.

The animals treated with stilbesterol-dipropionate continued to be in good health throughout the period of study. This treatment has given very promising results which may be extended with benefit on a large scale to initiate milk in barren heifers and cows whose number forms a considerable part of the cattle population of this country.

Yield and composition of milk secreted by animals treated with stilbesterol-dipropionate

Injections given	Days milking started after injection	Days in milk	Daily milk yield lb.	% Composition of milk				
				Fat	Solids not-fat	Total proteins	Lactose	Chlorine
Heifer No. 314.	←	→						
	—	7	1·0	3·5	11·64			
2 ml. ..	7	14	2·0	5·7	10·14	5·63	4·04	0·111
(1—4—46) ..	14	21	4·2	5·8	10·08	4·91	4·61	0·111
3 ml. ..	21	28	4·4	7·0	10·52	4·86	5·23	0·110
(11—5—46) ..	28	35	6·0	6·6	10·07	4·76	5·60	0·111
2 ml. ..	60	67	13·5	6·1	10·12	4·23	5·33	0·086
(2—6—46) ..	90	97	15·1	6·3	10·52	4·25	5·25	0·069
Heifer No. 445.	←	→						
2 ml. ..	—	50	0·6	4·3	10·48	5·55	4·04	0·159
(1—4—46) ..	7	57	1·1	4·7	10·15	4·56	4·71	0·123
2 ml. ..	14	64	2·9	5·2	9·80	4·18	4·97	0·106
(11—5—46) ..	21	71	3·4	6·1	9·87	4·25	5·10	0·102
2 ml. ..	28	78	4·0	6·5	9·63	4·20	5·14	0·079
(2—6—46) ..	60	110	4·7	5·8	9·25	3·95	4·90	0·069
	90	140	3·9	5·8	9·43	3·95	4·95	0·062
Heifer No. 332.	←	→						
	—	7	2·7	4·6	13·10	8·37	4·49	0·135
2 ml. ..	7	14	4·1	5·2	11·23	6·55	4·92	0·092
(26—5—46 ..	14	21	4·2	5·8	10·10	4·83	5·07	0·092
2 ml. ..	21	28	5·9	5·6	10·26	4·60	5·04	0·080
(15—6—46) ..	28	35	5·4	5·9	9·79	4·33	5·02	0·079
2 ml. ..	60	67	5·6	6·7	9·58	4·30	5·16	0·072
(6—7—46) ..	90	97	5·7	6·2	9·91	4·12	5·06	0·057

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FLOWERS WITH THREE STYLES IN *MUSA SAPIENTUM* LINN.

Musa sapientum Linn. (*M. paradisiaca* Linn.) is trimerous in its floral organs. In a normal flower, the inferior ovary carries on it the irregular perianth in two parts, one called the