A shrub frequently growing in saline soil of tidal zone. This plant occurs in Panjab, Sind and Rajasthan but is not reported so far from Kutch, Saurashtra and Bombay.

Trigonella occulta Delile in *DC. Prodr.*, 2, 185 ; Hook. f., *Fl. Br. Ind.*, 1876, 2, 87 (Papilionaceæ).

Joroda Badi in Jakhau, *Kanodia* 62046.

This plant is reported earlier from Lucknow, Ahmedabad and also as a rare plant in Sind. It has not been reported so far even from adjacent areas of Kutch such as Saurashtra, Bombay, Panjab and Rajasthan. It is quite common in moist places around Jakhau.

Astragalus prolixus Sieb. in *Fl. Aegypt. Exsice. ex Bunge Monogr. Astr.*, 1868-69, 1, 9 : Hook. f., *Fl. Br. Ind.*, 1876, 2, 121 (Papilionaceæ). Old Port Mundra, *Kanodia* 62043.

The earlier report of this plant in India is from Lahore (Panjab) and Sind. It is not reported from Saurashtra, Kutch, Rajasthan and Bombay. It is common on saline soil around Mundra.

Xanthium strumarium Linn. Boiss. Fl. Orient., 3, 251 ; Hook. f., *Fl. Br. Ind.*, 1881, 3, 303 (Compositæ).

Near Kharsara Talao, Bhuj, *Jain* 61493.

This weed has spread wild in several parts of India in waste places. Forest Department staff of Kutch informed us that the plant has entered Kutch only recently.

Heliotropium rariflorum Stocks in *Kew Journ. Bot.*, 1852, 4, 174 ; Hook. f., *Fl. Br. Ind.*, 1883, 4, 152 (Boraginaceæ).

Near Old Port Jakhau, *Kanodia* 62009 ; Old port Mundra, *Kanodia* 62062.

This plant occurs in Rajasthan, Panjab and Sind but not so far reported from Gujarat and Bombay. It is common in Kutch in dry loose saline soil.

Trichodesma amplexicaule Roth. Nov. Sp. Pl., 1821, 104 ; Hook ; f., Fl. Br. Ind., 1883, 4, 153 (Boraginaceæ).

Jorodi Badi Jakhau, *Kanodia* 62043 A.

The plant has not been reported so far from Kutch. The species is very close to *T. indicum* Br. from which it can be distinguished by the auricles at the base of the calyx which in this species turn inwards.

Euphorbia dracunculoides Lamk. Encyc. Method, 1786, 2, 428, Hook. f., *Fl. Br. Ind.*, 1887, 5, 262 (Euphorbiaceæ).

The plant is a common weed in cultivated fields but has not been reported so far from Kutch, Saurashtra and Sind.

Asparagus dumosus Baker in *J. Linn. Soc.*, 14, 609 ; Hook. f., *Fl. Br. Ind.*, 1892, 6, 315 (Liliaceæ).

Narayansarowar, *Jain* 61954 ; Old Port Jakhau, *Kanodia* 62010 and 62017.

Cooke[4] remarked about this plant as endemic to Sind. Santapau[5] reported it from Saurashtra. The plant is very common on all the coastal sands in Kutch.

Ephendra foliata Boiss. Fl. Orient., 1881, 5, 761 ; Hook. f., *Fl. Br. Ind.*, 1890, 5, 863 (Gnetaceæ).

On way to Kala Dungar, Khavda, *Jain* 61856.

The only report of this plant in India is from Punjab and Rajasthan. It has not been reported from Bombay and Gujarat States. We collected it from Kutch only on one occasion so far, climbing among the bushes of *Prosopis spicigera* Linn.

We are grateful to Dr. J. C. Sen Gupta, Chief Botanist and Shri R. S. Rao, Regional Botanist, Botanical Survey of India, for their kind advice and help in the preparation of this note.

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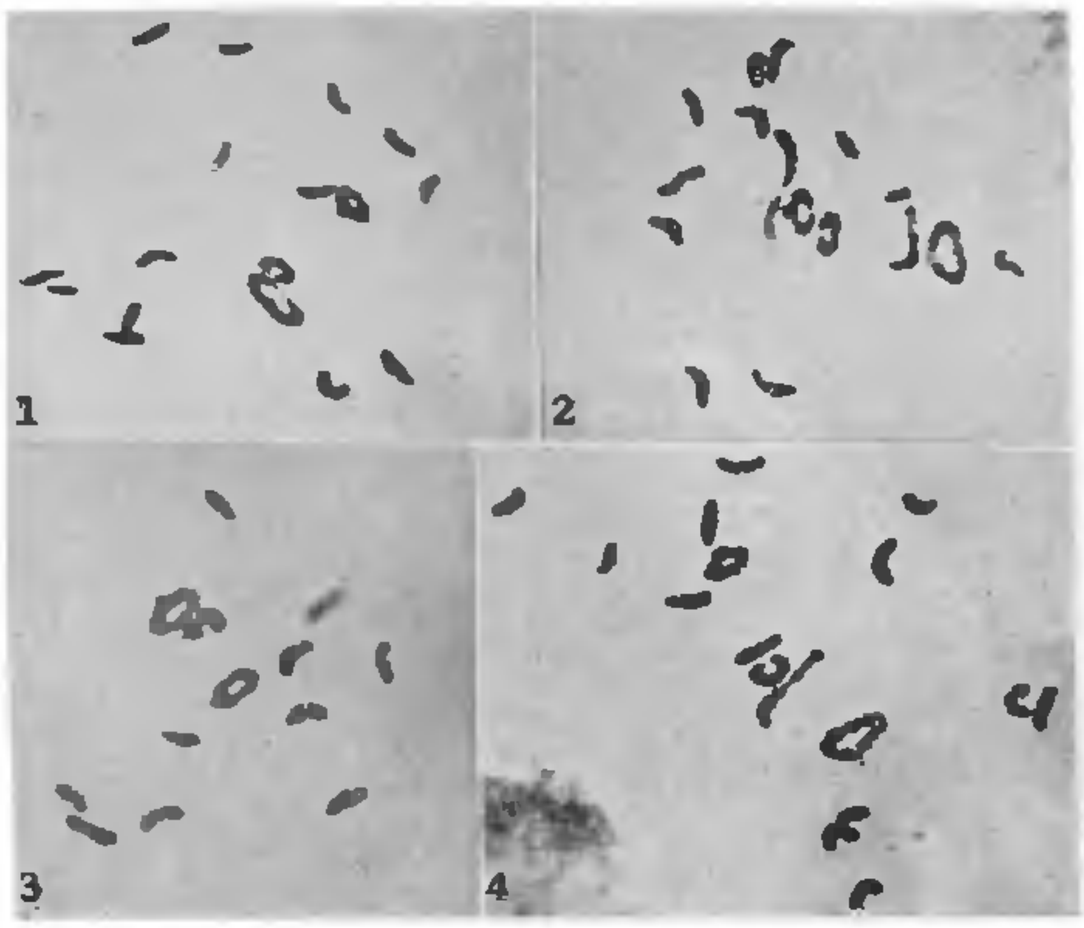
PRE-MEIOTIC SOMATIC-REDUCTION IN WHEAT

POLY-HAPLOIDS with $2n = 21$ have been isolated and induced in varieties of bread-wheat by several workers.[1,2] The cytological behaviour of nulli-haploids with $2n = 20$ have also been studied.[3,4] The occurrence of sporocytes with euhaploid or nulli-haploid chromosome numbers along with the normal cells has, however, been recorded only twice.[5,6]

During the identification of monosomic lines of the wheat variety Chinese Spring, one anther of a plant monosomic for chromosome XX (2 D) according to the revised nomenclature of Sears,[10] had cells with chromosome number ranging from 16 to 21. A majority of the cells studied (9 out of 15) had $2n = 20$ (Figs. 1 and 2). The chromosome number 16 (Fig. 3) 18, 19 and 21 (Fig. 4) were observed in one, two, two and one cell respectively. All other pollen mother cells showed $20_{II} + 1_{III}$ at first meiotic



FIGS. 1–4

Fig. 1. A cell showing $3_{II} + 14_{I}$. Fig. 2. A cell showing $5_{II} + 10_{I}$. Fig. 3. A cell showing $3_{II} + 10_{I}$. Fig. 4. A cell showing $4_{II} + 13_{I}$.

metaphase. The pairing behaviour noted in the aberrant cells is given in Table I.

TABLE I

Pairing behaviour in cells with reduced chromosome number

Cell No.	Chromosome number	No. of bivalents		Number of univalents
		Ring	Rods	
1	16	2	1	10
2	18	2	..	14
3	18	3	1	10
4	19	3	..	13
5	19	2	1	13
6	20	3	..	14
7	20	3	..	14
8	20	3	2	10
9	20	3	..	14
10	20	3	1	12
11	20	3	1	12
12	20	..	1	18
13	20	3	..	14
14	20	3	..	14
15	21	3	1	13

From Table I, it will be seen that some bivalents occurred in all the cells. Fourteen cells showed both closed and open bivalents and in one cell only one rod bivalent was present. The number of closed bivalents ranged from 1 to 3 per cell, with a majority of cells having 3.

In a 42-chromosome stable derivative of a wheat-*Agropyron* cross, Knott[5] observed five cells with 22 and four cells with 20 chromosomes. He attributed their occurrence to somatic reduction in a pre-meiotic cell. From the distribution of chromosome numbers and from the constancy of the number of closed bivalents in each chromosome number group, he concluded that a single initial reduction was responsible for the origin of these cells. The chromosome numbers in the fifteen cells observed in the present instance do not fall into any regular pattern and it is difficult to draw any conclusion as to the number of pre-meiotic cells in which somatic reduction has occurred. Theoretically any cell having a complete set of seven chromosomes of any one of the three genomes of hexaploid wheat is capable of undergoing division and as such a single reduction followed by subsequent divisions with chromosome eliminations could give rise to cells with different chromosome numbers. The other possibility is that somatic reduction took place initially in more than one cell. The nine 20-chromosome cells, with one exception, had 3 closed bivalents, suggesting that they may be derived from a single reduction followed by the mitotic duplication of that cell. Sears and Okamoto[7] in the variety Chinese Spring and Riley and Chapman,[8] in the variety Holdfast, have demonstrated the presence of a gene system (on chromosome V of Chinese Spring, H-H chromosome of Riley and Chapman) which restricts pairing to completely homologous chromosomes. In the absence of this system pairing can also take place between homœologous chromosomes. Thus a nulli-haploid for this chromosome shows, besides increased frequency of bivalents, associations involving four or more chromosomes. None of the nulli-haploid cells observed during the present study had any configuration higher than bivalent. These cells, therefore, should be deficient for a chromosome other than chromosome V of Sears and Okamoto or chromosome 'H' of Riley and Chapman.

Huskins[9] observed and later induced in monosomic wheat and some other plants, pairing and segregation of homologous chromosomes in somatic tissues. The fact, that closed bivalents occurred regularly in all the cells studied by the author, suggests that whole pairs of chromosomes were present in the nulli-haploid cells. Hence chromosome distribution in the cells which have undergone somatic reduction should have taken place at random without pairing and segregation of homologous chromosomes.

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DEMONSTRATION OF "PROPORTIONALITY ERRORS"

THE concept of DNA constancy per set of genome in a given species was first put forth by Boivin, Venderly and Venderly[1], Venderly and Venderly[7], and later by Mirsky and Ris.[2] Their observations were based on the chemical determination of the average DNA-content of nuclei. This concept has now been amply confirmed, at the level of individual nuclei, by the microspectrophotometric methods of measuring the DNA-content of individual nuclei in visible light. Some instances of apparent deviations have, however, emerged in some of these studies on different materials.

Various authors while interpreting their data as showing non-constancy of DNA seem to have assumed that deviations from proportionality between Feulgen dye—and DNA-content causing "proportionality errors" would always be negligible. Patau and Swift[4] pointed out that "proportionality errors" have, in many cases, obviously been small but that the assumption that they would always be negligible is unwarranted. A disproportionality between Feulgen dye—and DNA-content may be due to the disproportionality between the DNA-content and the number of aldehyde groups released by hydrolysis for the Schiff reaction. It may also be due to a disproportionality between the number of available aldehyde groups and the amount of Feulgen present. The latter kind may arise by incomplete staining, by overstaining or by loss of stain during the treatment with the sulphurous acid bleaching solution and subsequent dehydration. The duration of dehydration is largely found to have no noticeable effect on the intensity of staining (Srinivasachar and Patau).[6]

In this note how overlooking of an important step in the preparation of Feulgen slides for photometric measurements of DNA-contents of nuclei leads to the demonstration of "Proportionality errors" is reported.

TABLE I

Disappearance of a difference in mean dye-content between two slides after a second treatment with the sulphurous acid bleaching solution. Fixation : acetic alcohol 1 : 3 ; hydrolysis ; hydrochloric acid, eight minutes

30 minutes additional treatment with sulphurous acid bleaching solution				
	Before		After	
Number of replications per nucleus	4		2	
Slide No.	1	2	1	2
Prophase ..	22·74	20·76	12·97	13·19
	23·55	18·56	13·34	15·73
		18·74		15·00
		19·47		14·60
		20·82		12·96
Metaphase	24·77	18·04	13·70	12·14
	22·16	19·56	15·07	13·83
		19·00		12·62
		19·84		13·18
Anaphase ..	22·76	19·72	11·06	13·52
	23·20	18·80	13·32	13·34
		23·35		13·13
Mean ..	23·20	19·72	13·24	13·60
	Significance of difference : $t_{16} = 5·45$; $P < 0·0002$		decrease :	
			42·9%	31·0%

During the course of the DNA measurements of nuclei in the meristem of onion roots, by using the microspectrophotometric two-wave length method of Patau[3] with some modifications (Patau and Srinivasachar[5]) an inconsistency was found between two slides which contained sections from one sample of equally fixed roots and which had been hydrolysed and stained together. The dye-contents, measured in arbitrary units, differed significantly. Search for an explanation revealed that these slides with eight others were passed through the sulphurous acid bleaching solution and the dehydration series with pairs of slides held back to back and that it had been omitted to separate them. Thus it appeared possible that some sulphurous acid bleaching solution had been transferred between the adherent slides into the alcohol grades in spite of the rinsing with water. The last slides to be taken out of the sulphurous acid