vicinity of break points. The rationale of this analysis is but an extrapolation of Dobzhansky and Rhoades' approach for locating favorable dominant genes.

We are also planning to extend this analysis in order to locate, if possible, the components of the polygenic system controlling aspects of meiocyte development.

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1. Protein and some amino acid composition of Indian hybrid maize.

The six leading hybrids Ganga-3, Ganga-101, Ganga sufed-2, Ranjit, Deccan hybrid, and high starch as well as the opaque-2 mutant have been analyzed for crude protein and for lysine, leucine, tryptophan, and methionine content. The hydrolysis of the protein was carried out for six hours in an autoclave in 2.5N NaOH in the case of tryptophan and 2.5N HCl in the case of the other amino acids. The amino acids were estimated microbiologically with Leuconostoc mesenteroides P-60 (Steele, B. F. et al, J. Biol. Chem. 177:533, 1949) in collaboration with the microbiology Section of the Nutritional Research Laboratory. The results are presented in Table 1.

Table 1
(grams/16gms.nitrogen)

	Lysine	Leucine	Tryptophan	Methionine	Crude protein (in percentage)	Yield in Kg/Ha
1) Opaque-2	5.92	8.00	0.55	1.74	9.97	
2) Ranjit hybrid	2.95	12.30	0.44	1.91	10.19	4500
3) Hi starch	2.76	12.95	0.39	1.88	10.47	4500
4) Ganga-3	3.50	13.50	0.43	2.24	9.60	4000
5) Deccan hybrid	3.52	13.15	0.53	2.36	7.96	4900
6) Ganga saffeed-2	3.00	13.30	0.41	1.88	9.99	4500
7) Ganga-101	2.60	12.50	0.45	1.65	11.13	4100

There seems to be some relationship between methionine and crude protein content. The studies are in progress with inbred lines which might give some information regarding the protein content and the pattern of these essential amino acids.

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1. Alpha-amylase in developing maize endosperm.

An amylase-like enzyme was detected in developing maize endosperm during investigations of the phytoglycogen-forming branching enzyme. Investigations were then initiated to develop a reliable technique of extraction and fractionation of the enzyme, to determine the activity, nature and classification of the enzyme, and to determine the activity of this enzyme in several genetic endosperm mutants.

Fractionation and partial purification of the enzyme was accomplished through gradient elution with NaCl in Tris-maleate buffer from a DEAE-cellulose column. The products of enzyme action on amylose, glycogen and beta-limit glycogen were examined by thin-layer chromatography. The enzyme reaction was measured by the decrease in iodine-staining ability of an amylose solution that was being degraded by the enzyme. The enzyme activity was calculated by the rate of decrease in color of the iodine-starch complex.

The enzyme was found to degrade amylose, glycogen and beta-limit glycogen. Maltose, maltotriose and maltotetraose were produced in about equal amounts when amylose was used as a substrate. Action on glycogen and beta-limit glycogen gave less maltose than maltotriose and maltotetraose and the rate was slower than on amylose. No isomaltose or glucose were ever detected, even after extended periods of incubation, on linear or branched substrates.

Copper, iron, lead, mercury and p-chloromercuribenzoate inhibit enzyme activity. The enzyme was active after extended periods of dialysis against EDTA; therefore, a requirement for calcium was not demonstrated. The enzyme was very stable in water at 10°C for several weeks.

The enzyme was found to have a pH optimum near 6.8 in Tris-maleate buffer, which is higher than most amylases of plants. The pH of alpha-amylase in germinating corn kernels has been reported to be about 4.6-5.4; therefore, the amylase in developing maize endosperm was much higher. The Michaelis-Menten constant was calculated to be 0.08 per cent amylose.