The slash-mulch cultivation method reported for the Province of Choco in northern Colombia is also practiced in the valleys of the upper Rio Balsas drainage system.

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1. Terminal loop configurations in maize x teosinte hybrids.

Teosinte stocks collected in Mexico and Central America (MNL 37, 1963; MNL 38, 1964) have been crossed with a knobless New England flint (Wilburs Flint) and the pachytene chromosomes studied cytologically (Teosinte--The Closest Relative of Maize, Bussey Institution of Harvard University, 159 pp. 1967). Unique terminal loop configurations of the pachytene chromosomes have been observed in maize x teosinte hybrids using three of the recognized races of teosinte (Guatemala, Chalco, Central Plateau). These loops are very similar to inversion configurations and they are terminal, but it is questionable if they are, in fact, terminal inversions. These terminal loop configurations are seen in the short arms of chromosomes 8 and 9 and are not found in every cell prepared from a single anther in plants known to possess them. Some cells show a non-paired segment on the short arm, while the majority appear to be perfectly normal and pair with no observable inversion configuration. Working on the hypothesis that these loops represent several small chromosome rearrangements or small non-homologous segments in the short arm that, depending on condition at pachytene, may act as a single rearrangement, I have begun genetic studies with maize tester stocks for chromosomes 8 and 9 to test the suppression of genetic crossing-over and chiasma formation. Also, because these loops do not appear with regularity in lines known to show loop configurations attempts are being made to select teosinte lines in which the expression of the loop is complete in every pachytene cell. Genes unique to teosinte are hypothesized to reside isolated from maize introgression in these terminal inversion-like configurations. It is hoped that once these non-homologous segments are established in a high penetrance, loop forming line and genetically mapped, their transfer to a maize background will help us in identifying the genes which separate teosinte from maize.

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2. Teosinte x maize hybrids, Nobogame, Mexico.

Naturally occurring teosinte x maize hybrids have been reported from Mexican maize fields, but seldom, if ever, are these plants thought to have been purposely planted by the cultivator. Most maize x teosinte hybrids are attributed to teosinte fruitcases containing hybrids naturally disseminated in the field. Of all the sites where maize and teosinte are known to hybridize naturally the maize cultivation pattern at Nobogame has probably changed the least over the last 150 years (MNL 39, 1965). Therefore, a detailed analysis of the maize from a field where teosinte x maize hybrids were present was undertaken. A careful study

of the entire harvest was made and tripsacoid cobs selected. Also collected were 8 ears said by the cultivator to be the type he would use as seed ears. Four of these ears were studied. The cobs were shelled and 100 seeds from each ear grown. Three cobs yielded all maize plants but the fourth produced 3 maize x teosinte hybrids. Morphologically maize x teosinte seed could not be distinguished from the pure maize seed on these selected ears. Yet several ears from the field, which had been selected because they possessed smaller than usual seeds, all yielded uniformly teosinte x maize hybrids. There appears to be a chemical feedback mechanism (growth hormone) between the developing seed and the cob because if the ear is pollinated only by teosinte the hybrid seeds are smaller than the few maize x teosinte hybrid seed found on a predominately maize-pollinated ear. This hormone must act to stimulate the conduction of food through the cob to the developing seed.

In the seed corn at Nobogame, Mexico, the frequency of 3 maize x teosinte hybrids/400 plants compares well with the abundance of highly tripsacoid cobs found in the total harvest. These very productive seed ears are not highly tripsacoid, but they too show evidence of teosinte introgression (rigid cob, straight rows and indurated glumes).

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1. Tripsacum studies.

Tripsacum studies have begun to delineate the species lines and evolution of the genus Tripsacum from central Mexico north through the United States. Field collections have been made from the Mississippi Valley and from the Gulf Coast, and established in a genetic garden at the Riverside Research Laboratories of Tulane University. The discovery of a more widespread distribution of a narrow-leaved Tripsacum along the Gulf Coast has raised some question about the endemism of T. floridanum in southern Florida. These plants occur in both open and shade habitats, but always in very moist soils. Diploid T. dactyloides is not limited to wet environments, while tetraploid T. dactyloides often is found growing in wet soils. Field studies to date have tended to bear out the hypothesis put forward by Tantravahi (Tripsacum Newsletter 1968) for the hybrid origin of tetraploid T. dactyloides. Prior to the present study diploid T. floridanum and T. dactyloides were thought to be allopatric, but field studies of the Gulf Coast Region from Texas (Orange-Jefferson, Liberty, Harris, Fort Bend and Brazoria counties) to Florida (Highland, Polk and Hillsborough counties) shows that there are pockets of narrow-leaved T. floridanum plants which are probably remnants of a once more extensive Pleistocene distribution.

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