TABLE 5.—*Comparison between chromosome-breaking and mutagenic effects of chemicals in plant and animal materials.*

Compound	Chromosomal aberrations		Mutagenic effect
	Plant root-tips	Mammalian cells in tissue culture	
Adenine	+	+	+
2,6-Diaminopurine	−	+	+
Caffeine	+	±	+
8-Ethoxycaffeine	+	±	±
Purine riboside	−	+	+
Deoxyadenosine	+	+	No data
5-Fluorodeoxyuridine	+	+	No data
5-Bromodeoxyuridine	−	+	+
Cytosine arabinoside	−	+	No data
Maleic hydrazide	+	−	−
Azaserine	+	+	+
Streptonigrin	+	+	+
Mitomycin C	+	+	+
Hydroxylamine	±	+	+
Nitrogen mustard	+	+	+
Triethylenemelamine	+	+	+
Diepoxybutane	+	+	+

+ marked effect.
− no effect.
± effect very low, although just about significant.

From Actions of Chemicals on Dividing Cells, B. A. Kihlman, Prentice Hall, 1966, pp. 198.

Comparison between the Effects of Chemicals on Animal and Plant Cells.

termed a chromatid break. The factor that determines which type of lesion is produced is whether or not the chromosome is a single unit or a double unit at the time of the insult that produces the break. This in turn is dependent upon the stage of the cell cycle. If a chromosome is in the G1 phase of the cycle before DNA synthesis has taken place, it is a single structure, and if a break is produced at this time, the break is replicated along with the second chromatid during the S or DNA synthesis period resulting in a chromosome break. If the breaking insult occurs during G2 or thereafter, after DNA synthesis, when the chromosome is already a dual structure, then a chromatid break is the usual result. During the period of DNA synthesis, a combination of both types of breakage can be found in the same cell, depending on whether the individual chromosome had not yet started, or had finished synthesizing its DNA. It does occasionally happen that an event affects both chromatids after they are a double structure, and in this case the