Many of the diseases we confront with are iatrogenic in nature—that is to say, they are the result of the well-meant but injudicious use of therapeutic agents. In these days when tranquilizers take the place of baby-sitters, or indiscriminate and often needless exposure to ionizing radiations for diagnostic or therapeutic purpose has become so universal, it is small wonder that the old maladies are replaced by new man-made ones. Though routine testing of different therapeutic agents for their various physiological effectiveness is the main objective of modern pharmaceutical research programmes, toxicological side effects particularly the long term ones like genotoxic and cytotoxic effects are certainly not taken into consideration with the same weightage.

Since the first report on chromosome damaging effect of chemotherapy in man by Cohen and Lansky in 1961 a large number of pharmaceutical agents have been proved to be mutagenic. This has caused a great human concern and warrants testing of potential genotoxicity of pharmaceutical agents. Keeping all these in view in the present investigation an attempt has been made to evaluate potential genotoxic and cytotoxic effects of four drugs, viz. metamizole (Analgin), phenylbutazone, chloroquine sulphate and sulfamethoxazole. For phenylbutazone we have conducted a battery of assay systems such as: (i) bone marrow metaphase analysis, (ii) micronucleus test (MNT), (iii) spermatocyte chromosome analysis, (iv) dominant
lethal test (DLT), (v) sperm morphology assay and (vi) sperm count assay to have a reasonably comprehensive idea on its effect on mitotic, meiotic and post-meiotic cells. However, for other drugs all the assay systems could not be tested. During the course of our study with phenylbutazone a chromosomally mosaic male mouse was found. Cytogenetic analysis of this interesting mouse has also been done.

The work has been presented in two parts: Part I and Part II. Part I which is again divided into 7 chapters deals with the evaluation of the pharmaceuticals. Chapter I includes, in addition to the general introduction to the subject, choice of experimental animal and an introduction to different protocols employed here. The literatures on different drugs tested here have, however, been reviewed at the starting of the respective chapters. Materials and methods in general have been described in chapter 2. The effects of two analgesics, metamizole and phenylbutazone, have been described in two sections under chapter 3. Chapter 4 and Chapter 5 deal with the effects of chloroquine sulphate and sulfamethoxazole respectively. The work in Part I has been summarized in chapter 6. Chapter 7 contains all the references cited in Part I.

Part II deals with the cytogenetic analysis of the chromosomally mosaic male mouse.