CHAPTER 7

CONCLUSIONS
AND
FUTURE PLAN OF WORK
From this thesis entitled "The analysis and stability of Poisons and Drugs in Biological tissue: A forensic interest.", the following conclusions have been drawn.

1. Modern analytical instrumentation, i.e Derivative Ultraviolet Spectroscopy and High Performance Liquid Chromatography, used in the analysis of poisons and drugs from biological tissue proved to be ideal for their determination.

2. Compared to ordinary zero order spectroscopy, first, second and fourth derivative ultraviolet spectra improved the detection and quantitative determination of the studied drug groups and their mixtures given below.

   - **Antidepressants**: Dotheipin, Amitriptyline, Cyproheptadine, Imipramine and Trimipramine.
   - **Phenothiazines**: Chlorpromazine, Prochlorperazine, Thioridazine and Trifluoperazine.
   - **Antimalarials**: Chloroquine, Amodiaquine and Pyrimethamine.
   - **Alkaloids**: Strychnine and Brucine.
   - **Analgesics**: Aspirin, Paracetamol and Caffeine.
   - **Heroin and its adulterants in Brown Sugar**: Heroin, Papaverine, Methaqualone and Diazepam.

3. The different tissues used for evaluation of stability of drugs and poisons in this study, such as spiked post-mortem human blood and liver tissue and blood, liver, spleen and kidney tissues of rats dosed with these drugs, provided adequate conclusions regarding their stability. These conclusions could be extrapolated by Forensic toxicologists in cases referred to them as,

   i) Post-mortem blood and viscera samples usually referred to forensic laboratories, in cases of suspected suicides and homicides due to poisons, are analysed long periods after sample acquisition.

   ii) The temperature and storage conditions under which the stability studies were carried out are the normal conditions in Indian laboratories, which may lead to alterations in drug levels.
4. The drugs and poisons on which the present stability studies were carried out are available over the counter and occupy medicine cabinets of most urban households, making them the most commonly used tools for suicides and homicides.

5. Very often there is considerable delay in the analysis of drugs or poisons due to heavy work load in Forensic Science laboratories. Due to this there may be loss of drug or poison, leading to underestimation of the drug concentration at the time of the crime. Under such circumstances, the regression equations developed based on percentage recovery of drug with storage time, were of much value in predicting initial drug concentration in forensic cases.

6. The results of the stability studies suggested that

   i) In spiked post-mortem human blood, Strychnine, Chloroquine and Imipramine remained quite stable giving good (high) percentage recoveries within sixty days. Paracetamol, Aspirin, Diazepam and Oxazepam showed fairly good stability on analysis within thirty days. Chlorodiazepoxide and Nitrazepam were very unstable and were to be analysed immediately.

   ii) In spiked post-mortem human liver tissue, Imipramine, Chloroquine, Strychnine and Aspirin remained stable showing good recoveries on analysis within sixty days. Paracetamol and Diazepam gave good recoveries within thirty days. Chlorodiazepoxide however showed rapid losses on storage and had to be analysed immediately.

   iii) In blood of rats dosed with Imipramine, Chloroquine, Strychnine and Paracetamol, good recoveries could be obtained on analysis within sixty days of storage. Diazepam was stable on analysis within thirty days. Chlorodiazepoxide showed rapid losses on storage.

   iv) In liver, spleen and kidney tissue of dosed rats, Imipramine and Chloroquine remained stable within a storage time of sixty days. Diazepam and Strychnine up to thirty days. Paracetamol and Chlorodiazepoxide were unstable showing rapid losses on storage.

7. These results suggested that in cases of poisoning referred to Forensic Science Laboratories,
i) Blood samples of suspected cases of Strychnine, Chloroquine and Imipramine must be analysed within sixty days, Paracetamol and Aspirin within thirty days, while Nitrazepam and Chlorodiazepoxide are to be analysed immediately on sample acquisition.

ii) Analysis of human liver tissue samples of suspected cases of Imipramine, Chloroquine, Strychnine and Aspirin are to be performed within sixty days of acquisition, Paracetamol and Diazepam within thirty days and Chlorodiazepoxide immediately on sample acquisition.

These studies have been conducted on some poisons and drugs generally encountered in cases of suicide and homicide. Other drugs on which such studies are needed are

1. Synthetic pyrethroids.

2. Methyl Alcohol.


Work on the mechanism and chemistry of the degradation leading to drug loss from tissue and the effect of temperature, pH and preservation over degradation of drugs in biological tissue for the poisons and drugs studied in this work will be evaluated in future.