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Profile - Morton F. Mason

by Kurt M. Dubowski, PhD, DABFT

Internationally recognized as a forensic toxicologist, Morton Freeman Mason has actually had *three* brilliant careers: outstanding athlete; pioneer and innovative clinical chemist; and influential forensic scientist. Born in 1902 in Pasadena, California, he descended from Western settlers who made the arduous transcontinental trek by covered wagon via the Oregon Trail and has retained much of that pioneer spirit and tenacity.

He received his BSc in chemistry from Oregon State College (now Oregon State University) at Corvallis, Oregon, in 1925; next serving six years as research assistant in chemistry at the Federal Experimental Station, Michigan State College (now Michigan State University), while also taking part-time graduate studies in chemistry. Serving as a graduate assistant in the Department of Biochemistry at Duke University, Durham, North Carolina, and Assistant to the Clinical Chemist of Duke University Hospital from 1931-1934, he earned the PhD degree in Biochemistry from Duke University in 1934. During the next 50 years, Morton Mason combined an illustrious' academic career with an unrivaled lifework of high-level service and professional leadership, and became the recognized leader of forensic toxicology in the Southwest.

At Duke University School of Medicine, Morton Mason was trained by Doctor Haywood Taylor, a pioneer practitioner of toxicology, whom he assisted in the analysis of clinical and autopsy specimens for toxic agents. Thus began an involvement in clinical and forensic toxicology which would span five decades and encompass all of its aspects – research, teaching, academic and governmental service, consultation, publications, and massive contributions to professional organizations.

A lifelong physical fitness advocate and practitioner, Morton Mason in his younger years was an Olympic-caliber field and track athlete, winning many prizes and awards for individual and team performance and once serving as pacer for six-time Olympic gold medal long-distance runner Paavo Nurmi. His athletic prowess and natural teaching talents led to his appointment in 1925 as Assistant Coach of Field and Track Athletics at Michigan State College, a position he held in addition to his other duties until he moved to North Carolina.

Morton Mason's academic career first took him to Vanderbilt University Medical School where he served as clinical chemist to Vanderbilt Hospital 1934-44 and rose from Instructor to Associate Professor of Biochemistry and Research Associate in Medicine. He also continued the practice of toxicology, interrupting those endeavors only for postdoctoral studies and research in physiology and high-altitude physiology during 1937-38 as a fellow at Cambridge University, England, and the University of Basel, Switzerland.

When Southwestern Medical School was established in Dallas, Texas, in 1943, Morton Mason soon joined its faculty (in 1944) as Professor of Pathological Chemistry and Experimental Medicine and Chemist to Parkland (Memorial) Hospital, its primary teaching hospital. Simultaneously, he was appointed Toxicologist of the City and County of Dallas, and thus organized and directed what developed into one of the country's largest and most sophisticated clinical chemistry and toxicology operations. Many changes in title followed as the medical school became a part of the University of Texas system and his responsibilities increased, ultimately leading to the position of Professor of Forensic Medicine and Toxicology in the Department of Pathology. In 1956, when it was decided to establish a Dallas City-County Criminal Investigation Laboratory, Morton Mason became its founding director, subsequently incorporating the toxicology services for the newly established Dallas County Medical Examiner's Office. With a long-standing interest in the problems of alcohol toxicology, he was also personally involved in

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Yale Caplan

Mason continued

each of the approximately 3500 traffic-related blood and breath alcohol analyses performed yearly (1971 data) at his laboratory.

He continued to direct Parkland Hospital Clinical Chemistry Laboratory until 1972 and the Dallas County Criminal Investigation Laboratory (by then a unit of the Southwestern Institute of Forensic Sciences) until 1974. His continuous service at Dallas was interrupted only during 1972-73, when he was Visiting Professor of Clinical Pathology at the American University of Beirut, Lebanon. In 1978, he became Professor Emeritus of Forensic Medicine and Toxicology. However, he continued for years what, in typical MFM quantitative fashion, he described as "... a full time schedule, i.e., 40 hours/week, 11 months/year," and could indeed be located in his office, at work, on any given day.

A lifelong student, Morton Mason found time in the early 1950s to pursue formal studies in both basic science and clinical subjects at SW Medical School. This education in such fields as pathology, clinical pathology, microbiology, neuroanatomy, public health, and psychiatry combined with a superb command of chemistry, biochemistry, and pharmacology to give him a uniquely broad perspective and information base for his professional activities and make him usually the best informed member of any discussion group in his fields. Accordingly, his advice and services were in great demand nationwide, and he engaged in a seemingly

Research Queries

A Case of Talbutal Intoxication

Michael I. Schaffer, PhD; Nancy B. Wu Chen, PhD; and Carol Trojan, BS
Office of the Medical Examiner, County of Cook, Chicago, IL

History:

A 32 year old white male was found unclothed at home. There appeared to be no signs of foul play. His ex-wife related to two previous overdose episodes, one with methaqualone and the other ethchlorvynol. The subject was a podiatrist and wrote prescriptions in his wife's name, usually utilizing his triplicate narcotic blanks.

Analysis:

A general toxicology unknown screen was performed with only the RIA positive for barbiturates. Examination for basic and neutral drugs by GC was negative. All other toxicology examinations including ethchlorvynol were negative. Therefore a rountine GC screen was initiated for barbiturates, utilizing a Hewlett-Packard 5840A equipped with FID. A 1.2 m x 2 mm i.d. glass column packed with 3% OV-101 on Chromosorb W HP 80/100 was used for all the GC analyses. Initially the retention time for the unknown peak matched the amobarbital standard. After TMAH derivitization and reinjection, the GC retention time was also comparable with amobarbital. Initially this sample of blood was quantitated for amobarbital, with the concentration in blood of 20.8 mg/L. An analysis of the peak by EI GC/MS was consistent with the structure of 5-(1-methylpropyl)-5-(2-propenyl)-2,4-6(1H,3H,5H) pyrimidinetrione which chemically is talbutal (Lotusate®).

Quantitation was repeated with talbutal authentic reference standard and aprobarbital as internal standard. Concentrations of talbutal in blood, bile, and urine were 17.7 mg/L, 30.3 mg/L, and 11.2 mg/L respectively. This appears to be the first acute talbutal intoxication seen in this laboratory. Separation of talbutal and amobarbital was attempted utilizing a HP 5840 capillary inlet system with a J & W fused silica capillary column (DB5) 30 m x 0.25 mm. No separation was possible.

Comments:

We are presently attempting to pursue this duplicity of retention times seen with amobarbital and talbutal via both capillary and packed columns. If any of the readers have encountered this particular problem, we would appreciate your comments regarding protocol for routine toxicology examination of barbiturates.

Comparison of Ethanol in Pre and Post Embalmed Blood Specimens

Arden Bronstein and Moonyoung Park
Office of the Chief Medical Examiner, WV

Occasionally, we receive blood specimens from embalmed bodies and are asked to determine blood alcohol concentrations. We report our ethanol concentrations in these cases and include a statement to the effect that the sample was apparently obtained from an embalmed body, i.e., formaldehyde and methanol were detected, and that the reliability of the ethanol concentration is questionable.

To determine whether there was a consistent decrease in ethanol concentrations after embalming, we analyzed blood specimens taken from the same individuals, both at autopsy and after embalming. (These blood specimens were drawn from our own Medical Examiner cases at autopsy and with the cooperation of a local embalmer after embalming.)

Autopsy and embalmed blood specimens were analyzed on the same day by gas chromatography. A Perkin-Elmer Model 3920 gas chromatograph with flame ionization detector was used under the following conditions: column was 0.2% Carbowax 1500 on Carbopack C packed in a 1.8 m (6 ft) glass column; operating temperatures were: oven at 100°C; injection port at 150°C; and detector at 150°C; and the carrier gas, nitrogen, at a flow rate of 20 mL/min. The gas chromatographic procedure was that of N. D. Jain in "Direct Blood-Injection Method for Gas Chromatographic Determination of Alcohols and Other Volatile Compounds" in *Clinical Chemistry*, Vol. 17, No. 2, pp. 82-85 (1971). Tertiary butyl alcohol was used an an internal standard.

Each sample was mixed 1:1 with the t-butyl alcohol internal standard solution (0.16 g/100 mL). In the case of embalmed samples, occasionally the methanol FID response was extremely large and interferred with the ethanol calculations. These samples were then diluted (by a factor of 2 to 3 with a saline solution) to correct for this problem. The subsequent ethanol calculation was corrected by multiplying by the dilution factor. Table I shows our results.

The mean change in ethanol concentration was a 52% decrease ± 10.5%. Therefore, with 95% confidence, the blood ethanol concentrations were found to decrease by 52 ± 21%.

Our limited data demonstrates the extreme difficulty of extrapolating a meaningful blood ethanol concentration at death using an embalmed blood specimen.

Acknowledgement:

We would like to thank James Lowry, Embalmer, for his assistance in this project, and Ronald C. Backer, PhD, Chief Toxicologist, for his encouragement.

Table I.

Case Number	Ethanol Concentration at Autopsy (g/100mL)	Ethanol Concentration after Embalming (g/100ml)*	Percent Change
1	0.230	0.100	-66%
2	0.310	0.200	-57%
3	0.340	0.148	-35%
4	0.210	0.075	-56%
5	0.280	0.150	-62%
6	0.300	0.162	-47%
7	0.370	0.216	-41%

* The cases were all embalmed by the same individual to eliminate any error attributable to different embalming solutions and/or different techniques. The embalming solution did not contain ethanol.

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unending series of professional activities, especially in toxicology.

Clinical and forensic research and case work resulted in about 100 professional publications ranging from fundamental studies on renal insufficiency to toxicological methods which became standard in the field and to review and opinion articles which continue to be cited as the leading authority. Meanwhile, Morton Mason served as a consultant to numerous government agencies, industrial, and research organizations. A list too long to recite fully includes the Veterans Administration, National Institutes of Health, Federal Aviation Administration, Center for Disease Control, and the Department of Transportation.

A member of perhaps 30 or more national and international organizations, Morton Mason helped to found two – TIAFT and SOFT – and was most active as an officer of several chemistry, clinical chemistry, and forensic science groups. Bodies he headed as president or chairman included the Dallas-Fort Worth Section of ACS, Dallas Society of Analytical Chemists, National Safety Council Committee on Alcohol & Drugs, AAFS Toxicology Section, and the American Academy of Forensic Sciences. Deeply interested in professional credentialing, he is a quadruple board diplomate: American Board of Clinical Chemistry (in clinical chemistry and toxicological chemistry), American Board of Industrial Hygiene, and American Board of Forensic Toxicology, becoming the first diplomate of the last board. He also served as a founding director of ABFT, and as a director and chairman of the examination committee of ABCC for seven years. Among his many key long-term professional contributions are service as Assistant and Associate Editor and Editor-in-Chief of the Journal of Forensic Sciences 1956-73, and on the Toxicology Resource Committee of the College of American Pathologists 1973-83. As Editor of JFS, he upgraded that journal significantly, by establishment of high standards for publication and unswerving insistence on maintaining them, and by vast personal efforts in editing, and often rewriting, the accepted contributions.

In addition to his athletic awards, Morton Mason has received dozens of other major professional recognitions and awards. Some of these are designation as the Tenth Annual Tinsley Harrison Lecturer at the University of Alabama Medical Center; Analyst of the Year Award of the Dallas Society of Analytical Chemists; first W. T. Doherty Award of the Dallas-Fort Worth Section of the American Chemical Society; Distinguished Service Award of the American Board of Clinical Chemistry; Toxicology Section of the American Academy of Forensic Sciences; and the 1980 Outstanding Clinical Chemist Award of the Texas Section of AACC.

Firm in the belief that chemistry is an exact science, Morton Mason throughout his career has insisted on adequate identification of toxic analytes according to the classical concepts of independent confirmation by at least two chemically-different principles, and on proper quantitation to the appropriate number of significant figures.

During his years of forensic laboratory direction, he always maintained an "open book" policy of full access to his laboratory's original analysis records and files by either party in any adversary proceeding in which he participated. Moreover, he has always believed in, and practiced, the philosophy expressed in one of his most widely cited scientific articles, written with Kurt M. Dubowski in 1976: "In the law-science relationship, it is inconceivable that recognizably faulty science should be employed to bolster good law." The same sense of propriety, order and exactitude is reflected in his major hobby, horology, especially the restoration to perfect function of antique and railroad pocket watches. Prior to undertaking the more demanding aspects of this work, Morton Mason persuaded a master watchmaker in Dallas to allow him to serve an unpaid apprenticeship in the fundamentals of watch disassembly, cleaning, timing, and repair. His restorations ultimately became exquisitely jeweled masterpieces in themselves, each keeping perfect time.

Morton Mason has greatly enriched and enhanced forensic toxicology by his contributions, made with integrity and dignity. By any standard, he is one of the luminaries of our field.

Research Queries continued

Amoxapine Blood–Liver Ratios

Thomas Rejent
Forensic Division
Erie County Laboratory, Buffalo, NY

Richard Prouty's excellent presentation of tri-cyclic "apparent distribution and variances" stimulates further documentation of my continuing position on the importance of blood-liver ratios in many cases where drug overdose is the sole cause of death.

Case 1

January 1984 – Female, age 23, suicidal.
Blood amoxapine = 6.9 μg/mL
Liver amoxapine = 85.9 μg/g
Gastric amoxapine = 2.7 mg total
Ratio = 1:12.0

Case 2

April 1984 – Male, age 28, suicidal.
Blood amoxapine = 11.1 μg/mL
Liver amoxapine = 133.3 μg/g
Gastric amoxapine = 98.6 mg total
Ratio = 1:12.4

Observation:

In the absence of trauma, autopsy procedures and securing samples is constant in this facility. Despite the apparent difference in amount of drug ingestion, the ratios remain practically identical. The single citation in *Disposition of Toxic Drugs and Chemicals in Man,* 2nd Edition, R. C. Baselt adds further fuel to this consistency.

Challenge:

Does anyone have evidence showing radically different findings?

Question:

Are blood:liver ratios a *better* documentation of acute sole-cause ingestion than blood levels only?

Comments invited to be published in future issues of ToxTalk.

Notice

NOMINATIONS FOR SOFT OFFICERS 1985

Nominations are welcome and invited for President, Vice-President, Treasurer, and one member of the Board of Directors. Please address all communications to:

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Board of Directors Meeting

The Officers and Board of Directors of SOFT met on February 22, 1984, in Anaheim, California, during the annual AAFS Meeting. The 1983 annual meeting was a scientific and financial success and appreciation was expressed to President Monforte and his wife, Pat, for their efforts.

The 1984 meeting will be in St. Louis at the Breckenridge Hotel on October 9–13 in conjunction with the Southwestern Association of Toxicologists (SAT). The 1985 meeting will be in Montreal, Quebec, on September 21–27 in conjunction with the Canadian Society of Forensic Sciences. The 1986 meeting will be in Reno/Lake Tahoe, Nevada, on October 29 – November 2 in conjunction with the California Association of Toxicologists and SAT.

Committee appointments were announced by President Monforte and published elsewhere in ToxTalk. Dr. Kincaid reported that we have eight new members and the application forms would be revised to ensure better input from sponsors of new members. Eighteen members were dropped from the rolls for nonpayment of dues.

The Board approved the applications of Mr. Daniel Isenschmid and Mr. Bruce Goldberger as recipients of SOFT Educational Research Awards.

A proposal was presented and approved for SOFT to retain an individual to be designated as an executive meeting coordinator at a total cost not to exceed $1000.00. The individual would coordinate all the usual activities associated with putting on the annual meeting and would be able to maintain continuity and avoid duplicative efforts. In addition, the individual would perform in an executive capacity to maintain pertinent Society and membership records.