PROFILES IN FORENSIC TOXICOLOGY

Dr Alan Stewart Curry (1925-2007)

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Dr Alan Curry is probably most remembered as being an outstanding toxicologist and a world leader in that subject. He was a researcher who wanted to develop analytical methods in forensic toxicology that would be used across the world. His book Poison Detection in Human Organs ran to four editions and he published some 100 scientific papers, as well as being a sought-after lecturer. He was one of the founding members of TIAFT and was its first Secretary and served two terms as its President. TIAFT's Alan Curry award, its most prestigious award, is named after him. From working at the Wakefield and Harrogate Forensic Science Laboratories, he became Director of the Nottingham Forensic Science Laboratory where he and his colleagues developed the gas chromatographic method for blood alcohol analyses which became his most cited publication. Due to his undoubted management and research skills, he was appointed as the first Director of the Home Office Central Research Establishment which aimed to find methods that would enable the regional laboratories to obtain evidence not previously available, to increase the value of scientific evidence and to increase productivity. He later became Controller of all of the Home Office Forensic Science Laboratories.

Introduction

Dr Alan Curry (figure 1) had an outstanding career as a forensic toxicologist. His research skills were developed when he carried out his PhD studies at Cambridge University under Sir Alexander Todd. He continued to carry out research when he joined the Home Office Forensic Science Laboratories and had some 100 scientific papers to his name by the time he retired. This as well as the publication of Poison Detection in Human Organs and the editing of seven books. He was regarded as an expert forensic toxicologist by the police and appeared many times in court in poisoning cases. He was also a teacher and mentor and wanted toxicologists to share their knowledge and expertise. This desire to communicate information led to the founding of TIAFT.

Founding of TIAFT and its early days

Dr Alan Curry was a founding member of TIAFT. Together with George Clarke, he invited forensic toxicologists who were attending an international meeting on forensic medicine and allied subjects held in London to a lunch to discuss whether a new international society for forensic toxicology should be formed (figure 2). There was approval from those attending and a committee of three were asked to develop a proposal: Dr Alan Curry, Dr George Clarke and Dr Irving Sunshine. Subsequently, at an evening meeting on 21 April 1963 at the Clifton Ford Hotel in London, it was decided to form TIAFT. Those present elected Dr George Clarke as President, Dr Alan Curry as Secretary, Dr Ian Holden as Treasurer and Dr Fred Reiders as Newsletter Editor. Thus, was TIAFT born [1].

At a further meeting two days later, the important topic of the interchange of analytical data for drugs was discussed. It was recognised that no one laboratory could generate all the information that laboratories needed and that sharing such analytical information was the best way forward. Drs Curry and Sunshine agreed to come forward with a proposal to gather such information which included:

1) A first list, in alphabetical order, of common poisons and drugs which would form the basis for the collection of analytical data.

2) The essential analytical data should comprise: melting points, ultraviolet spectra, paper chromatographic data, thin-layer chromatographic data and gas chromatographic data.

The proposal was discussed at a meeting in 1966 and plans for its collection and publication were put into effect. Many

Figure 1 (left): Photo of Alan when younger.

Figure 2 (right): Some of those who started TIAFT. Back Row: Morton Mason, Bob Forney Sr., Ray Abernathy, Harry Leach, Michael Moss. Front Row: Irving Sunshine, Bryan Finkle, John Jackson, Alan Curry.

laboratories contributed analytical data over the next three years, but it was Dr Curry's laboratory at Aldermaston which was the major source of analytical data. Dr George Clarke convinced the Royal Pharmaceutical Society of Great Britain to collate and publish the analytical data so that laboratories around the world could benefit from the collection. It was published in 1969 as The Isolation and Identification of Drugs [2] to include chapters on how to use analytical techniques to generate the data. For example, Alan Curry contributed a chapter on thin-layer chromatography [3]. "Clarke", as it is now known, is now in its fourth edition including data on over 2100 drugs being available in book and electronic form [4].

After being the first Secretary of TIAFT, Dr Curry became its President in 1969. He was re-elected as President in 1972 at the third Triennial meeting of TIAFT in Edinburgh when he gave presentations on "Computerised Information Retrieval for Toxicology" [5] and "The Automated Analysis of Urine for Drugs of Abuse" [6]. He was a real visionary and in 1974 wrote in the TIAFT Bulletin:

> *"Clearly the days of test-tubes have gone; the next ten years must see the implementation of the latest techniques in the routine toxicology laboratory. Already mass spectrometry linked to gas and high pressure liquid chromatography is becoming essential and I see T.I.A.F.T. introducing a computer based analytical data bank within the next few years. As far as research is concerned I hope we shall see much greater effort put into answering the fundamental question "has this poison or drug caused death?" In my view, it is not sufficient only to improve analytical techniques to find and quantitate toxic substances - we must be able to investigate their action on the organism and show that an essential-to-life process has been irreversibly damaged. To do this I think we are going to have to turn to the microscope and demonstrate not as we do today that the poison is in the brain or heart but discover which particular cellular area is involved and find if possible that an essential enzyme system has been inhibited. The toxicologist is not a glorified analytical chemist and I hope the next ten years will enable him to demonstrate his expertise in finding the methods whereby extraneous substances cause death and how they do it." [7].*

In 1975, he retired from the TIAFT Presidency. In his President's Report he stated:

> *"Over the last six years I have tried to uphold the principles laid down at the Inaugural Meeting in 1963 in that TIAFT should be a forum for the rapid interchange of information"* [8].

He recognised the importance of the Presidency of TIAFT and in 1984 presented a Presidential Medallion to TIAFT during the opening session of the first full triennial meeting of the TIAFT Conference in Brighton to mark the Association's "Coming of Age" (figure 3) [8]. The President of the day, Prof Hans Brandenberger, accepted the medallion on behalf of TIAFT. This medallion now hangs from the Presidential Chain of Office which has gilt bars giving the names of all the TIAFT Presidents.

He was a regular attendee at TIAFT Conferences and was at the 40th Anniversary celebrations in London in 2003 including the reception held on HMS Belfast (figure 4).

The TIAFT Alan Curry Award

Probably the greatest acknowledgment that TIAFT has made to Alan Curry, is to name its most prestigious award after him. It is awarded to TIAFT members who have a long history of distinguished contributions to the field of forensic toxicology and to the TIAFT organisation. The award consists of a memento engraved with the name of the award and the awardee's name and a diploma. It was first awarded in 1993 to Neville Dunnett and the award was presented to him by Alan Curry at the TIAFT Conference in Tampa. It has been awarded a total of 22 times up to 2017 and the list of recipients reads as a Who's Who of modern forensic toxicologists.

Education

He was born in Blackpool in 1925 and went to the Arnold School also in Blackpool. His interest in science led him to study at Trinity College, Cambridge reading chemistry (figure

Figure 3 (left): Presidential Medallion of TIAFT. Photograph kindly provided by Alain Verstraete.

Figure 4 (Right): On HMS Belfast on the occasion of TIAFT's 40th Anniversary, 2003. From left to right: Bryan Finkle, Marilyn Huestis, Alan Curry, Rokus de Zeeuw and Robert Wennig. Photograph kindly provided by Alain Verstraete .

5). Trinity College was founded in 1546 by Henry VIII and is the largest of the Cambridge Colleges by undergraduate numbers. It has many famous members including Sir Isaac Newton, Lord Rayleigh, Lord Rutherford and Sir Lawrence Bragg; a total of 32 Nobel Prize winners have attended Trinity College. One College tradition is the Great Court Run which involves attempting to run around the Great Court within the length of time that it takes the College clock to strike twelve o'clock. The "Film Chariots of Fire" used this challenge effectively. The course is approximately 370 metres long and, depending upon the state of winding, the clock takes between about 43 and 44.5 seconds. A tough task!

His chemistry degree studies were interrupted by a period of National Service in the Royal Air Force which included a spell in Canada. It was during this period that he further developed his interest in the uses of the radio. He left the Royal Air Force with the rank of Flight Lieutenant (Wireless) and returned to his studies at Cambridge. After obtaining his degree in Chemistry, he started research during 1949-1952 with Sir Alexander Todd FRS at the University Chemical Laboratory leading to a PhD. The title of his thesis was "The Chemistry of the Adenosine Nucleotides" (figure 6). Alan Curry synthesised adenosine diphosphate and related compounds, and analysed them mainly using paper chromatography, measuring their Rf values, using radiolabelled P^{32} in the molecules. He also extracted the chromatographic spots and ran ultraviolet spectra of the purified compounds he had synthesised. All this research was funded by a Senior Research Scholarship awarded by Trinity College and a grant from the Ministry of Education under the Further Education and Training scheme.

His career

After gaining his PhD in 1952, he started as a forensic scientist at the Home Office Forensic Science Laboratories in Wakefield and then in Harrogate after the Wakefield Laboratory closed. It was during the 1950s and 1960s that he started to make his name in forensic toxicology. He was very interested in the development of new analytical techniques and published many method for the detection, identification and quantification of drugs and poisons in biological materials. One of his most high profile cases was the poisoning of Elizabeth Barlow by her husband Kenneth Barlow, a male nurse, in 1957. This was the first documented case of murder using insulin [9]. Kenneth Barlow stated that he had found his wife's body in the bath submerged in the water. He tried to resuscitate her, but to no effect, so he called the local doctor. The doctor in turn called the police as it was a suspicious death and they called in Dr Price the local Home Office pathologist. He collected blood samples from various parts of the body and submitted them to Dr Curry at the Home Office Forensic Science Laboratory, Harrogate. Dr Curry did not find any of the usual drugs or poisons. The body was therefore re-examined and two injection sites were found in each buttock. Tissue samples of the buttocks were then sent to Dr Gurd of the Boots Pure Drug Company who found a total of 84 units of insulin in the samples. Dr Curry went on to analyse blood samples from various parts of the body, including the heart. Dr Curry confirmed the earlier discovery that blood glucose concentrations in blood from the right side of the heart do not reflect that in the rest of the body after death. The results of all the analyses was that the court convicted Kenneth Barlow of his wife's murder [10].

In 1964, he was promoted to become the Director of the Home Office Forensic Science laboratory at Nottingham where he continued his research as well as managing the whole of the resources of the laboratory supplying forensic services to the local police and courts. Dr Andrew Fawcett remembers Dr Curry's enthusiastic style of directorship walking around the laboratory to make sure that everything was working properly. Dr Curry would often give Dr Fawcett an excited telephone call at 5 o'clock in the morning saying, "Andy we have a murder". This would swiftly be followed by Dr Curry arriving in his white Mini Cooper to take them both to the scene.

Dr Curry's aptitude for research and good management was recognised by the Home Office and, when in 1966 they decide to open a Central Research Laboratory (CRE) in Aldermaston, it was he that was appointed as its Director. The CRE aimed to find methods that would enable the regional laboratories to obtain evidence not previously available, to increase the value of scientific evidence and to increase productivity. It quickly developed a world-wide reputation for the excellence of its

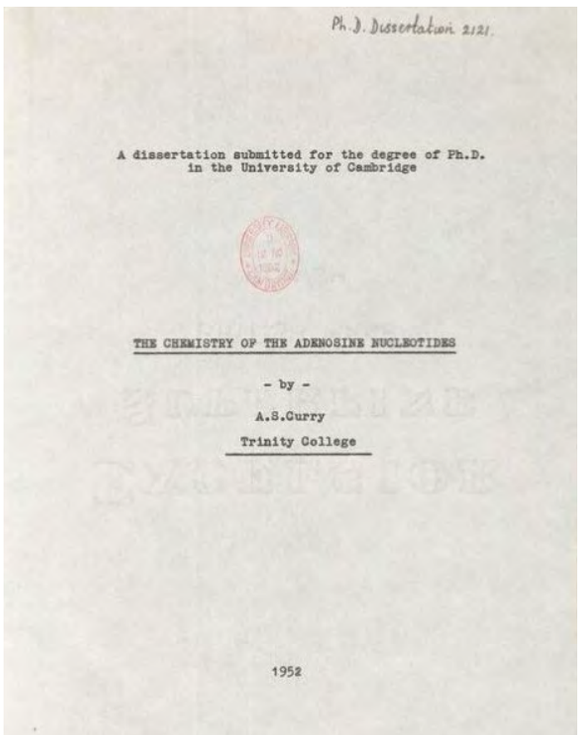


Figure 5 (left): Trinity College's Great Gate, the main entrance to the College which was founded in 1546 by Henry VIII who's statue is in the niche in the centre of the Gate. In his right hand he holds a table leg instead of the original sword.

Figure 6 (Right): Front page of Alan Curry's PhD thesis, 1952 Reproduced by kind permission of Venise Curry and the Syndics of Cambridge University Library, PhD 2121.

scientific research and information dissemination and as one visitor put it, "It is the Mecca that all forensic scientists should visit" (figure 7).

He was promoted to become Controller of all the Home Office Forensic Science Laboratories in 1976 with his Office in Horseferry House, London. He was often the person to whom important requests for funding of Home Office Forensic Science Laboratories were ultimately made. He had a sign on his desk which read "Decide Yourself" to remind him that he was the one who had to make, often difficult, decisions. However, he was always on the side of those who made requests to him against those who would wish to keep costs down and regularly said, "Give me a case that I can defend".

Although he retired from full-time employment in 1982, he maintained his interest in forensic toxicology through TIAFT and other organisations of which he was a member.

Consultancy

As a world renowned forensic scientist, he was asked to advise on many aspects of the science and management of forensic science laboratories by many overseas governments. He was a UN Consultant in Narcotics, 1972– 91; an Honorary Consultant in Forensic Toxicology to the Royal Air Force, 1973– 91; and a Consultant in Toxicology to British Airways, 1982– 91 amongst others. He continued to give advice to governments after his retirement in 1982, eg to the South Australian forensic science services, when a formal response to his recommendations was published [11].

Development of analytical techniques

In his early days as a forensic scientist, Dr Curry wrote five-yearly reviews in toxicological analysis which gave him a great base of knowledge in the subject for his future research [12, 13]. He recognised the value of simple tests such as the Reinsch test for arsenic as well as the great value of mass spectral analyses. He also knew that, whereas major laboratories may have all the facilities, others have to work with much smaller budgets and in climates in which certain solvents may be volatile at room temperature. He and his co-workers therefore developed methods that would be applicable all over the world. In this respect, his publications on the use of paper chromatography in systematic toxicological analysis [14], chromatography in toxicological analysis [15] and ultraviolet spectrophotometry [16] have been particularly well received.

Deaths due to barbiturate overdose were common in the 1960s and Dr Curry developed a rapid method to screen for barbiturates using chloroform extraction, reaction with mercuric ions and a colour reaction with dithizone [17]. This method was later modified to give quantitative answers [18]. A thin-layer chromatographic method for the identification of common barbiturates was also developed around the same time [19].

A subject of one of his early researches was the development of methods of analyses for inorganic poisons, with thallium in biological material by flame spectrophotometry and atomic absorption being reported in 1969 [20]. A report of a death from thallium poisoning was made in the same year [21]. The quantification of arsenic in hair was carried out in 1976 using a new method developed at the CRE in Aldermaston [22]. The only drawback was the need for a nuclear reactor! However, Dr Curry had the convenience that the Herald reactor was located at the Atomic Weapons Research Establishment, Aldermaston located 100 yards from his laboratory.

He recognised that the automation of analyses would be of great benefit to forensic toxicologists and carried out a number of research projects to accomplish this. One such development was a continuous extractor for use in toxicological analysis using ethanol under reduced pressure for the isolation of many

Figure 7: Staff of the Home Office Central Research Establishment, 1973.

poisons from viscera. Ethanol was chosen as the extraction solvent as many poisons are soluble in it and it is widely used. Barbiturates, glycosides and alkaloids were shown to be successfully extracted using this apparatus [23].

Dr Curry and his colleagues also built an instrument for the automated analysis of drugs in urine using a Technicon AutoAnalyser. The instrument was adapted for extracting drugs from urine and for subsequently detecting them by ultraviolet or visible absorptiometry, or by spectrofluorimetry. Manifolds for different drugs were constructed and 20 samples of urine per hour could be analysed for morphine and 10 samples per hour for barbiturates and basic drugs [24]. His group also developed an automated colour test apparatus to further speed analyses [25].

Even before the era of hyphenated techniques, he recognised the advantages of combining chromatographic and spectroscopic techniques and his group at Aldermaston developed a method for the micro infra-red spectroscopy of gas chromatographic fractions [26].

He once said:

"What hope is there that a 'dipstick' will soon be developed with which general practitioners can test drug concentrations in their patients?" [27].

He foresaw the need for the quick and easy tests that we have available today.

Poisoning cases

Cyanide poisoning was common in the 1960s and Dr Curry had experience of two cases of hydrocyanic gas poisoning and compared the analytical results to those of seven deaths after oral ingestion [28].

Ergot is a classic abortifacient and in a case involving ergometrine, the normal methods of analysis did not work. Dr Curry therefore developed a method for the isolation of ergometrine from viscera by extraction with ether from an ammoniacal aqueous solution saturated with ammonium sulphate. Purification was achieved by paper chromatography and detection by ultraviolet fluorescence and reaction with p-dimethylaminobenzaldehyde. The detection of ergometrine and procaine in urine samples after administration of therapeutic doses was also described [29].

In 1962, there were about 5,000 fatal poisoning cases in the UK; carbon monoxide, the barbiturates and aspirin accounting for most of them. Dr Curry recognised that reports of some of the more uncommon poisoning were not being published, so he looked through the records of poisoning over the previous ten years from the Home Office Forensic Science laboratory at Harrogate from analyses for which he was responsible. From these records, he selected 21 uncommon cases of poisoning to publish so that other toxicologists could benefit from his experiences [30].

If one does not look one does not find

One of his greatest contributions to the science of forensic toxicology was to publish his advice to practising forensic toxicologists. As he wrote in his article The Unusual, The Difficult and The Impossible in 1992:

"The message in this Paper is to trust one's test tubes, TLC plates, GC trace or MS print out---but remember, if one does not look one does not find. Toxicologists should write this message on a mirror above their desks." [31].

This advice comes through in what is probably his most esteemed publication "Poison Detection in Human Organs" (figure 8) which systematically covered analytical toxicology from the analysis of initial blood and urine samples to the interpretation of the results [32]. It was first published in 1963 through to its fourth edition in 1988 – a span of 25 years. The three sections covered were: (1) emergency hospital toxicology where the patient is alive and something has to be done quickly, (2) post-mortem toxicology where the question is "Is it poisoning?" and (3) guidance as to what can be done when a specific request is made with information about individual

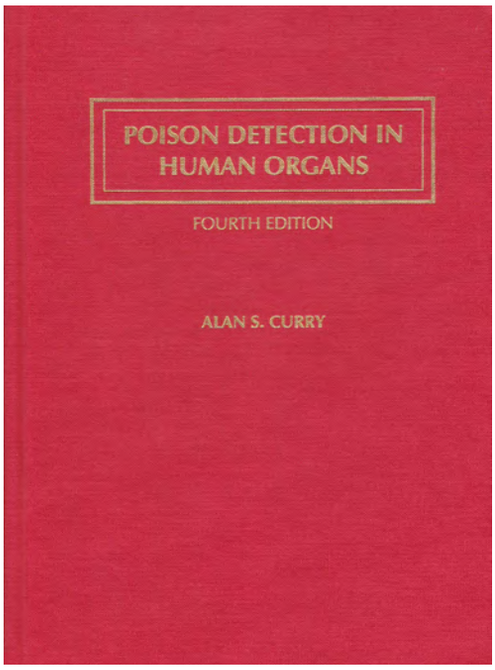


Figure 8: Alan Curry's Poison Detection in Human Organs, Fourth Edition.

poisons arranged alphabetically. It was highly regarded in the field at the time and was the major reference source for many new to forensic toxicology. It is worth repeating his premise, "if one does not look then one does not find".

He also gave advice to pathologists. When a pathologist, faced with an unknown cause of death, comes to the conclusion GOK (God only knows) Dr Curry suggested that that is the time to bring in the toxicologist [33].

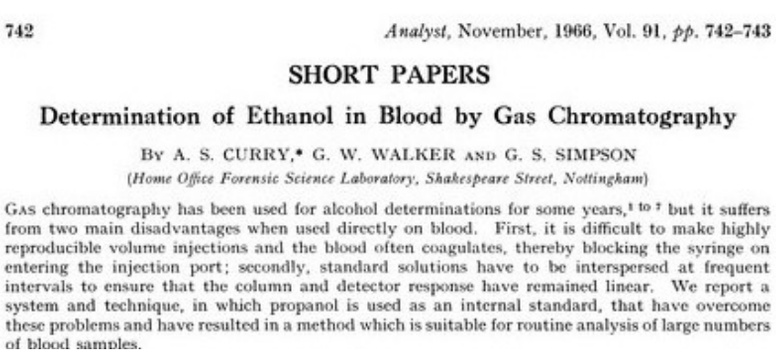
Alcohol analyses

In the UK during the early 1960s, the relevant legislation concerning drink-driving was the Road Traffic Acts of 1960 and 1962 which made it an offence: "to drive, or to be in charge of, a motor vehicle while unfit through drink". Unfit through drink was defined as meaning "when the ability to drive properly is for the time being impaired". This normally meant an account of the driver's ability given by a witness or police officer or a clinical examination by a police surgeon. The driver could be asked to provide a blood or urine sample, but they were not obliged to do so.

The Road Safety Act of 1967 was a huge change in that it made it an offence to drive whilst having a blood or urine alcohol concentration above proscribed levels. These concentrations were set at 80 mg% for blood and 107 mg% for urine as levels at which the average driver is twice as likely to have an accident as he would if he had not been drinking. The Act also gave the police the powers to require a driver to provide a blood or urine sample. To enable forensic science laboratories to accurately measure blood and urine concentrations, Alan Curry's group at the Home Office Forensic Science Laboratory, Nottingham created a gas chromatographic method which became the standard method within the Home Office laboratories (figure 9) [34]. This paper subsequently become his most cited publication [35]. The method involved dilution of the blood or urine sample with a solution of the internal standard (n-propanol) and injecting 1 µl into a gas chromatograph with a 5 foot, 10% PEG 400 on a 100 to 120 mesh Celite column with a flame ionisation detector both at 85°C. An electronic integrator measured the peak areas and provided a linear calibration graph which was superior to measuring peak heights. During the first 12 months after the Act, about 1,100 fewer people were killed on the roads [36], showing that the Act was having a profound effect on the mortality rate of drinking drivers.

The gas chromatographic method was later changed from liquid injection to head space injection using the Perkin-Elmer Multifract F40 which became the standard instrument for blood and urine alcohol analyses in the Home Office Forensic Science Laboratories. Dr Curry had previous experience of headspace analyses when he used it to analyse blood samples for volatile poisons in the Nottingham Forensic Science laboratory [37].

When a driver was stopped by the police, they were empowered to require a driver to take a breath test which was a screening device. Should the test prove positive, the driver would be taken to a police station where a further breath test would be given. The reason for the second test was to rule out a positive test on the first occasion being due to mouth alcohol being present due to very recent drinking. The device was a mouthpiece fitted to a disposable glass tube containing crystals covered with an acidified solution of potassium dichromate connected to a bag with a known capacity. The driver blew through the crystals in the tube into the bag until it was full. If the yellow crystal turned green past a line on the tube, the test was positive. At the time of the Act, there was only one Home Office approved breath alcohol testing device manufactured by the German company Dräger. During the early 1970s other companies offered their products to compete with the Dräger product and the Home Office needed a laboratory to compare them. They naturally went to Dr Curry who was then at the Home Office Central Research Establishment at Aldermaston.


742 *Analyst*, November, 1966, Vol. 91, *pp.* 742–743

SHORT PAPERS

Determination of Ethanol in Blood by Gas Chromatography

By A. S. CURRY,* G. W. WALKER and G. S. SIMPSON

(*Home Office Forensic Science Laboratory, Shakespeare Street, Nottingham*)

Gas chromatography has been used for alcohol determinations for some years,[1 to 7] but it suffers from two main disadvantages when used directly on blood. First, it is difficult to make highly reproducible volume injections and the blood often coagulates, thereby blocking the syringe on entering the injection port; secondly, standard solutions have to be interspersed at frequent intervals to ensure that the column and detector response have remained linear. We report a system and technique, in which propanol is used as an internal standard, that have overcome these problems and have resulted in a method which is suitable for routine analysis of large numbers of blood samples.

Figure 9: Determination of Ethanol in Blood by Gas Chromatography, Analyst, 91 (1966) 742. Reproduced with permission from the Royal Society of Chemistry.

Figure 10: Dr Curry receiving the Jean Servais Stas Gold Medal at the symposium of the German Society for Toxicological and Forensic Chemistry by the founding President James Baeumler in Mosbach, 1983.

Both tube products comparable to the Dräger device were compared as well as the newer electronic hand-held devices and later the electronic evidential devices. Reports given by Dr Curry to the Home Office were then used to determine if a product should be approved for use by the police.

The method for comparison was have a panel of volunteers who drank a known quantity of alcohol (their choice of product) early in the morning and have them blow into the devices throughout the day at the same time as their blood alcohol concentrations were measured by the accurate gas chromatographic method. The critical concentration was at 80 mg% alcohol in the blood where the devices should have given positive results above that concentration and negative ones below that. The volunteers were taken home by car at the end of the day having had a thoroughly enjoyable time.

Quality assurance

Dr Curry recognised that, not only should forensic scientists give accurate information and opinions, but that they should be seen to do that. One way of demonstrating this was to set up a formal quality assurance system and, as Director of the Home Office Central Research Establishment, that is exactly what he did for the UK Forensic Science Laboratories. A special Section was created that set quality assurance trials, some open and some blind, so that laboratories could assure their results and show to the police and courts that the correct results were being obtained. As he put it in an article in the TIAFT Bulletin in 1992:

"Quality Control or, as some people call it Quality Assurance, is a two edged weapon. It is rather like contraception--with it one feels safe--without it one takes chances. Most systems will

Figure 11 (left): Dr Curry being presented with the Douglas M Lucas Medal from the American Academy of Forensic Sciences by Dr Graham Jones who was the Academy's President, at the TIAFT meeting in Paris, 2002. Also pictured are Olaf Drummer and Marilyn Huestis. Photograph kindly provided by Alain Verstraete.

Figure 12 (right). The Athenaeum Club in London. The first home of the Crippen Club.

Figure 13: The Crippen Club at the Royal Pharmaceutical Society, 1996.

fail and all Quality Control involves extra work. Instead of one quick test (after all we all know a red colour means a positive) one thing leads to another---soon one is doing a negative control, a positive control, a standard from a National or even International QA scheme and masses of paper are generated." [31].

As Controller of the Home Office Forensic Science Laboratories, he was responsible for creating the role of Assistant Directors in each laboratory who had special responsibility for quality assurance. They were the forerunners of today's Quality Managers. Forensic Science laboratories accredited to ISO 17025 have much to be thankful to Alan Curry's for his pioneering ideas.

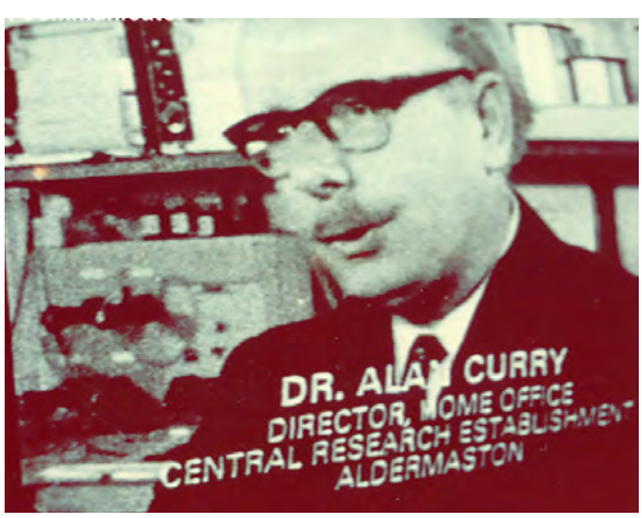
Communication

Alan Curry knew that excellent communication was essential for the rapid interchange of information. For over 25 years he was part of a circular tape recorded network with Ray Abernathy (Head Toxicologist, Los Angeles County), Elliott Hensel (US Agency for International Development) and Irving Sunshine (Chief Toxicologist, Cuyahoga County Coroner's Office, Cleveland, Ohio). Over many thousands of hours, they shared their knowledge and experiences in forensic toxicology to the benefit of all those who worked with them.

At the Home Office Central Research Establishment, Aldermaston, he created its Information Division with a role to disseminate information collected from the published scientific literature and case data collected by UK forensic science laboratories and sent to Home Office Forensic Science Laboratories. For forensic toxicologists, analytical data generated by the Drugs and Toxicology Division was of great value as was the collection of post-mortem fatal blood and tissue concentration data collected from cases in forensic science laboratories across the UK. To accomplish this, some 200 journals were scanned every two weeks for papers of toxicological interest in methodology and interpretation and then indexed. A computer in Brussels was used to organise the information so that searches could be undertaken to retrieve information of a particular topic [38]. Each scientific paper was indexed using up to 10 keywords using a specially developed in-house thesaurus. There were over 10,000 papers indexed by 1974. For storage purposes, each scientific paper was microfilmed and supplied to the regional forensic science laboratories.

Dr Curry also set up the Drugs Intelligence Laboratory at Aldermaston which collected, collated and disseminated information concerning drugs of abuse cases analysed by the forensic science laboratories in the UK. The Laboratory sent the information not only back to the forensic laboratories that had provide the data, but also to the National Drugs Intelligence Unit at the Metropolitan Police Headquarters in New Scotland Yard. This Unit was created in the 1970s to deal with international crime focussing on drugs. It comprised officers from the Association of Chief Police Officers, customs officers and Interpol Drug Enforcement Administration officers. The Unit became the National Criminal Intelligence Service in 1992 with a remit to gather intelligence data and analyse this information to provide the necessary insight and intelligence to national police forces. However, the information on drugs cases analysed by UK forensic science laboratories continued to be provided by the Drugs Intelligence Laboratory at Aldermaston set up by Alan Curry.

Another way of increasing collaboration and information exchange between laboratories was the setting up of Inter-Laboratory Advisory Committees in the various branches of forensic science. He chaired the one on Toxicology which for many years spearheaded the research and development of forensic toxicology in the UK forensic science laboratories. It set up inter-laboratory trials to prove the value of new methods,



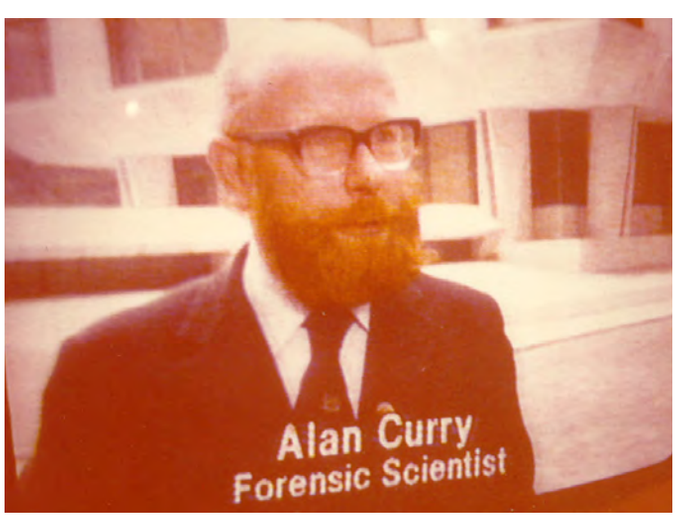


Figure 14: . Dr Curry on television; (a) 1974 and (b) 1979.

Figure 15: Curry on Crime – front page of Chemistry in Britain, 5, November 1969. Reproduced with permission from the Royal Society of Chemistry.

developed quality assurance mechanisms and allowed the free exchange of information about current cases. Much of the information shared in this way was later published in the scientific literature so that forensic toxicologist across the word could benefit from the information.

Specialised collections and distribution of analytical data was also a major area, For example, the infra-red spectra of over 2,000 compounds of forensic interest were obtained from the North Eastern Forensic Science Laboratory and provided to regional laboratories on microfilm. Further, a system of searching the infra-red spectral database for an unknown compound was developed using optical coincidence cards. This was the forerunner to computer searches of spectral and chromatographic data developed later [39]. Another example of the collection of analytical data was the running of ultraviolet spectra of drugs from the collection of over 700 alkaloids held by Professor George Clarke. Again, these spectra were provided to the regional laboratories on microfilm and later on microfiche.

Honours and awards

Dr Curry has been the recipient of many honorary appointments in recognition of his work in forensic toxicology: Honorary Member of the Belgian Pharmaceutical Society and Honorary Fellow of the Royal College of Pathologists as well as an Honorary Doctor of Science degree awarded by the University of Ghent in 1985.

He was presented with the 1982 Jean Servais Stas Gold Medal at the symposium of the German Society for Toxicological and Forensic Chemistry by the founding President James Baeumler in Mosbach in 1983 (figure 10).

At the TIAFT meeting in Paris in 2002, Dr Curry was presented with the Douglas M Lucas Medal from the American Academy of Forensic Sciences by Dr Graham Jones who was the Academy's President (figure 11).

TIAFT honours its members who have given great service to it, eg past Presidents and Secretaries, by giving them Honorary Membership of TIAFT and Dr Alan Curry numbers amongst those who have been so honoured.

Crippen Club

The exchange of information was a particular interest of Dr Curry especially when it was carried out with a drink in his hand, with friends at his side and in convivial surroundings. Therefore he, together with George Clarke (now a professor) and John Jackson, started the Crippen Club in the 1970s which dined at that time at the Athenaeum Club in London where he was a member. The majority of the members of the Athenaeum were professionals concerned with science, engineering or medicine; so Alan fitted in very well. However, at that time, the Athenaeum was a mens' only club so all the members of the Crippen Club were male toxicologists. The Clubhouse is a most impressive building with a Doric portico, above which is a statue of the classical goddess of wisdom, Athena, from whom the Club derives its name (figure 12).

In 1996, the venue was changed to the Royal Pharmaceutical Society and women were then allowed as members (figure 13). The Constitution of the Club was simple - there was no Constitution. However, it was agreed by the members in 1969 that the Crippen Club was to be a Dining Club of Forensic Toxicologists who were outstanding in their professional achievements, at the dinner a Member shall give a ten-minute talk which shall be aimed at distillation rather than evaporation and a toast was to be drunk at each dinner to the memory of the late Professor George Clarke. Today it meets at the Royal Society of Medicine, but keeps true to the values that Alan Curry originally laid down.

Public speaking

Alan Curry had a talent of explaining difficult things to audiences. As analytical techniques could detect less and less in biological materials he explained the "new" detectable concentrations of ng/ml by comparing a concentration of 1ng/ml to dissolving a sugar cube in 200 five ton elephants. This accompanied by a slide showing 200 elephants!

He was often asked to appear on television to explain difficult concepts in forensic science to a lay audience (figures 14a and 14b). These were important interviews because he was representing the Home Office on these occasions either as the Director of the Home Office Central Research Establishment or later when he was Controller of the Home Office Forensic Science Laboratories. He had an easy-going style that was authoritative and friendly at the same time which made him an excellent ambassador for forensic science.

One of his most influential publications was "Chemistry and Crime" in Chemistry in Britain which went to all the 30,000 members of the Royal Society of Chemistry in 1969 (Figure 15) [40]. In that article, he wrote:

> *"Forensic science is one of the most intellectually demanding and yet rewarding professions; as one of the common services provided by the Home Office for all police forces it helps the police officer ascertain the truth in all the situations that come to their attention in this modern civilization."*

He later went on to say in the same article:

> *"In the end the results have to be communicated to policeman, layer and juryman. The value of good scientific evidence can be lost if this channel of communication breaks down, or worse still, weak scientific evidence can be*

overemphasized in a manner prejudicial to the defendant."

He clearly saw that good communication to lay people was a vital part of being a forensic scientist.

I read this article whilst I was working in the USA and thought that he would be a great person for whom to work and subsequently applied and obtained a position with him. Robert Wennig, one of TIAFT's past Presidents had a similar experience and wrote in a TIAFT Bulletin:

"As a graduate chemistry student in Strasbourg I had the opportunity to read the article "Chemistry in Crime" by Alan Curry in the periodical Chemistry in Britain (1969). This article was at the origin of my personal decision to become a forensic toxicologist. When I asked him for a reprint of his article (at that time we had not yet online access) Alan sent me his business card to encourage me to become a forensic toxicologist and he told me that crime will never decrease so that I will not take the risk to be unemployed. I followed his advice and have never regretted it". [41]

One wonders how many other scientists were encouraged to be forensic scientists by this article of Alan's.

In 1977, he gave a review lecture on forensic science stating that eight laboratories with a staff of about 700 then covered the whole of England and Wales. He used a fictional crime of kidnapping to illustrate how the scientist can help the police officer in his enquiries. The lecture was so well received that the Royal Society published it [42].

An editor's role

Apart from writing scientific papers and books himself, Alan Curry was a very competent editor of scientific books. He had the ability to get authors to agree to providing chapters in the book he was editing and arranging with publishers to publish books in a timely fashion. He edited the books: two volumes of Analytical Methods in Human Toxicology [43, 44]; two volumes of Methods of Forensic Science [45]; Advances in Clinical and Forensic Toxicology [46]; and, with his wife Venise (nee Hewitt), two volumes on the Biochemistry of Women [47, 48]. These show the breadth and depth of his knowledge concerning analytical methods.

Hobbies

One of his hobbies was using an amateur radio (a radio ham) with the call sign, G3DMQ. His interest in radios started from the young age of ten when he used to build radios with a friend. He was always wanting bigger and better aerials and was severely injured when he fell from a tree in 1977 whilst trying to run an aerial from his house to a branch on a tree some distance away. His other interests were sailing and he always wanted a slow left-arm bowler for his Aldermaston cricket team. When asked by a reporter from Chemistry in Britain what he enjoyed most, he said, "eating and drinking". This was then published as "a connoisseur of good food and wine" [40]. I think that the reporter got it right.

Concluding remarks

Apart from being one of the world's greatest forensic toxicologists, a superb manager and one of the founders of TIAFT, Alan Curry was also generous, a great communicator and tremendously supportive of his staff and fellow toxicologists. But his best quality was summed up by my son who, when Alan phoned me one day, said: "Dad it's that nice man on the phone". Alan Curry was – that nice man.

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