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Public Analysts of the Past

An Address by the retiring President, Miss Joan Peden, presented at the Annual General Meeting of the Association of Public Analysts in Taunton, Somerset, on 3 May 1975.

Much of the material for this talk comes from a book called 'Fifty Years of the Society of Public Analysts', published in 1932, by Dr. Bernard Dyer, one of our elder statesmen, who died in 1948, aged 92. Actually, part of the background research was then carried out by a young assistant named Hamence. Another source was the 1974 Society for Analytical Chemistry publication, 'The Practising Chemists', written jointly by Dr. Hamence and Dr. Chirnside. Both are extremely readable books, which any chemist will find to be of interest whether he is a Public Analyst or not.

Last July the Society for Analytical Chemistry had a splendid week of Centenary Celebrations, which I enjoyed as a guest. I said then, in my greetings, that Public Analysts were the true progenitors of the occasion, since they founded the Society and it carried their name for 79 of those 100 years. So I should like to tell you a little of the first 25 years of the Society of Public Analysts, which covers almost exactly the last quarter of the 19th century. We also have a Centenary of sorts this very year, for the first provincial meeting was held at Bristol in August 1875, when the new Food and Drugs Act (Mark III) was discussed.

All Public Analysts know of our official origin in the 1860 Act, the first of its kind in the world, 'for Preventing the Adulteration of Articles of Food or Drink', which merely permitted the appointment of Analysts by various bodies, such as the Courts of Quarter Sessions in the provinces, and the District Boards or Vestries in Outer London.

Such an optional start produced few results and so the improved Act of 1872 was passed, which led to actual appointments. In Somerset, for instance, we have the minutes of an Epiphany Sessions, in beautiful copperplate handwriting, containing an order for the appointment of 'A First Class Analyst' and on 21 February 1874 the Local Government Board approved Mr William Walter Stoddart, who was 'a person professing competent Medical Chemical and Microscopical Knowledge', at a salary of £100 a year, plus £50 for 'making and sustaining a suitable Laboratory'. He was also Public Analyst for the City of Bristol. He died in 1880 and was succeeded by his son.

In their book, Drs. Hamence and Chirnside make a clear distinction between the two types of chemists operational at that time. On the one hand there were the down-to-earth workers who needed to make a living from the job; these

are the 'practising chemists' of their title. The others were the theoretical chemists of the academic world, talented amateurs who treated science as a hobby, dons, doctors of medicine and even some 'interested clergymen'.

They must have been the last of an age when an educated man could dabble in many differing disciplines. The Elizabethan statesman Francis Bacon was also an eminent lawyer and essayist—and, apparently, the first man to prepare frozen chicken. The story goes that he died in 1626 of a chill caught while trying to preserve a dead fowl by stuffing it with snow. Then we have Robert Boyle (of Boyle's Law), who wrote 'The Sceptical Chymist' (a good title) in 1661, and was described by his publisher as the 'Father of Chemistry and Uncle of the Earl of Cork'.

In 1874, many chemical analyses were carried out by professors in University laboratories or by lecturers in colleges. There were a few private consultants, but commercial analysts were regarded as 'outside the pale'. When an appointment had to be made by a Local Authority, the matter was usually put into the hands of the Medical Officer, who occasionally took over the job himself on the basis of his Public Health qualifications, which covered a very little chemistry. There were exceptions like Dr. Letheby, who was Medical Officer and Public Analyst for the City of London and Lecturer on Medical Jurisprudence to the London Hospital.

Six professors from hospitals in London were among the 25 Public Analysts who met at the City Terminus Hotel, Cannon Street, London, on 7 August 1874, a historic date in our story. This meeting was set up by six men: Charles Heisch, A. H. Allen, G. W. Wigner, August Dupré, Theophilus Redwood and Thomas Stevenson. They had invited 77 men, who held 110 appointments between them, and 57 replied, but only 25 were able to attend.

Dr. Redwood (whose portrait is on the S.A.C. President's badge) took the chair; he was Public Analyst for Middlesex and Professor of Chemistry to the Pharmaceutical Society. Members were almost evenly divided between London and other parts of England:—Bucks., Bradford, Cheltenham, Devon, Huddersfield, Ipswich, Leeds, Manchester, Salford, Sheffield, Staffs. and Wolverhampton. It was resolved that an Association of Public Analysts be formed 'for the purposes of mutual assistance and co-operation', and it was meant to be much more practical than academic. Two other objectives of the newly-formed body may sound a little odd at first. They were:—

(*a*) to refute unjust imputations, and

(*b*) to repudiate proposed measures of interference with our professional position.

Both of these arose from the report of the Select Parliamentary Committee set up to study the workings of the 1872 Act. One witness had stated that 'there are not a dozen competent analysts in the Kingdom', and the Committee had proposed that tests of competency should be imposed on all Public Analysts, with 'Somerset House' as the official arbiter for all disputes arising from reports. At that time 'Somerset House' meant the Inland Revenue Laboratory and there was considerable resentment at the suggestion.

They finally decided to call themselves the *Society* of Public Analysts (hereinafter known as the S.P.A.) and, once off the ground, the group sorted out its main tasks, as follows—

1. To define 'adulteration',
2. To agree on food standards,
3. To consider the 1875 Act, then imminent,
4. To educate members in the legal side of their work,
5. To establish the normal composition of foods,
6. To develop agreed methods of analysis.

After great discussion, the members decided on a long, detailed definition of the word 'adulteration', upon which previous Acts had foundered. It starts:—
'An article shall be deemed to be Adulterated in the case of a Food or Drink

(1) if it contains any ingredient which may render such article injurious to the health of the consumer,
(2) if it contains any substance that sensibly increases its weight, bulk or strength, unless the presence of such substance is due to circumstances necessarily appertaining to its collection or manufacture, or be necessary for its preservation, or be acknowledged at the time of sale,
(3) if any important constituent has been wholly or in part abstracted, without acknowledgement being made at the time of sale,
(4) if it be a colourable imitation of, or be sold under the name of another article.'

There were similar provisions for drugs and a few examples of compositional limits proposed for milk, butter, tea, cocoa and vinegar. Milk minima, for instance, were 9·0 per cent. solids-not-fat and 2·5 per cent. fat, but these were later found to be based on an erroneous method of fat determination, which gave results about 0·5 per cent. lower than the true figure.

After all these efforts, it was ironic that the word 'adulteration' was dropped from the 1875 Act, which was entitled the *Sale* of Food and Drugs Act. There was a strong suspicion that the definition of adulteration had been quite beyond the powers of the Parliamentary draughtsman. Nevertheless, the work was not wasted, for it established principles still in use today.

Once associated, our forerunners moved fast. At an S.P.A. meeting a century ago, in May 1875, the subjects were—

Melting Point of Fats (Tripe, Angell and Heisch),
Minimum Solids in Milk (Campbell-Brown, of Liverpool),
Milk Ash (Wanklyn, P.A. for Bucks.),
Tartaric and Citric Acids (Allen of Sheffield) and, most interestingly,
Relation of Public Analysts to their Local Authorities (Wigner), which also covered the division and sealing of samples and forms of report.

These papers and the S.P.A. Proceedings were at first published in 'Chemical News', owned by Mr (later Sir) William Crookes, but 'a little friction arose' and the Council resolved that the Society should publish its own Journal, which would be free to members and cost 3/6 a year to non-members, or 6d a single

copy. The first issue came out in March 1876 and was entitled simply 'The Analyst'. At those prices, it is perhaps not surprising that the loss in the first year was £80, and the publication was taken over for a time by two registered proprietors. The Council of the S.P.A. was rather unhappy about losing a measure of control, but eventually (in 1891) total control was regained. One of the first papers, incidentally, was by R. R. Tatlock, on the danger of metals in foods prepared in enamelled cooking-vessels.

In 1877, the S.P.A. President was Dr Dupré, who was the official Analyst of Explosives to the Home Office. During the Sinn Fein bombing outrages of 1882 he examined many so-called 'infernal machines', especially those of the notorious Whitehead, of Birmingham, who was eventually arrested in the middle of his unstable manufacturing process, with 170 lb. of nitroglycerin in the next room.

We are due for yet another Centenary in 1977, for the Institute of Chemistry (not 'Royal' until later) was formed in 1877. The oldest established body in our science is the Chemical Society, founded in 1841, but the terms of its Charter were then thought to prevent it from acting as the organising and qualifying body for chemists which began to be needed at this time.

It was proposed to call this new association the 'Institute of Professional Chemists' but Government did not approve of this title. The Privy Council seemed to regard professional chemists merely as failed pharmacists and the Board of Trade hardly recognised the existence of chemists at all; they insisted that it be called the 'Institute of Chemistry'.

'It appears to be insufficiently recognised that, in some of the large provincial cities and towns, the local Public Analyst, in addition to this public duties, undertakes such matters as water analysis and toxic investigations, while his Laboratory is the natural centre of commercial analytical work for local industries'. This quotation comes from 'The Analyst' of 1877, and shows that the Public Analysts of those days were able and willing, as they are today, to exercise their analytical skills in many fields other than food analysis.

There is evidence of this in the type of papers then being read to the S.P.A., which show a wide variety of subjects. We have—

1. 'Copper as a normal constituent of Plant and Animal Tissue' by Dupré,
2. 'The Poison of the Cobra' and 'The Albuminoids of Cheese' by Winter-Blyth,
3. 'Composition of Commercial White Lead' by Wigner and Harland,
4. 'Elimination of Potassium Chlorate in Urine' by Hehner,
5. 'Assay of Carbolic Powders' by Allen,
6. 'Nitrogen Compounds of Cereals and Coke' by Wigner,
7. 'The Analysis of Cleopatra's Needle' by Wigner. (This Egyptian monolith had been purchased for £10,000 by Sir Erasmus Wilson, a Victorian dermatologist, who gave it to the nation. It had been proposed to treat it with water-glass before it was erected on the Embankment, where it still stands, but Wigner advised wax.)

You may think that there are few foodstuffs in that list, but the cruder forms of food adulteration were still very much present. In the second half of Dyer's book, Ainsworth Mitchell (then Editor of 'The Analyst') records many of the more interesting cases of those first five decades.

In 1878, rice was adulterated with added wax, muffins with plaster of Paris, marmalade with saltpetre and skim milk with chalk. There were prosecutions for tea coloured with Prussian blue and 'filled' with sand and china clay. One tea contained 6 per cent. of small stones carefully wrapped in leaves—the sort of craftsmanship one does not get nowadays. In this year, also, a publican at Stafford was fined £50 for selling beer containing 'grains of paradise' and a retailer at Manchester prosecuted for sweets coloured with 0·4 grains per ounce of lead chromate.

In 'The Analyst' of 1881, C. T. Kingzett stated that he had 'frequently stressed, orally and in print, the desirability of the official extension of the duties of the Public Analysts in many directions, with some additional office, such as Municipal Chemist, to advise on gas and water supplies, sewage treatment and disposal, disinfection, dust-laying and road-surfaces, etc. The Public Analyst should be in the wider field of public utility'. A few years later, Allen was to suggest that we examined such articles as oil and petrol, yeast, disinfectants, carpets, wallpaper and rat-killers, under the control of a Sanitary Analysis Bill.

G. W. Wigner was President of the S.P.A. in 1883, and died in office at the age of 42. By 1884, Dr. Augustus Voelcker was suggesting that the law against adulteration should be extended to cattle-foods, and 8 years later a Bill was introduced in Parliament to prevent "Adulteration of Manures and Feeds", which led to the first Fertilisers and Feeding Stuffs Act, of 1893. In 1885, a chemist called Reichert put forward a distillation method for the examination of butter-fat, which was 'very coldly received'.

The President at this time was Alfred Hill of Birmingham and he was followed by A. H. Allen, already mentioned, who was to become well-known for the many volumes of his 'Organic Analysis', By 1889, it was Matthew Algernon Adams, of Kent, who 'enjoyed an extensive practice as a specialist in ophthalmic surgery, but loved his Laboratory better than his consulting room'—hence the Adams coil, long used in milk analysis.

There has not, as yet, been any real mention of drugs or medicines. This was an age when the remedy for a headache was not a couple of aspirins, but could be a mixture of '2 drams of Rochelle salt, 1 dram infusion of senna, 1 tsp. tincture of cardamom; to be taken in a wineglassful of Eau de Cologne'. It was also the hey-day of patent medicines, such as—

Morrison's Universal Pills—said to prevent insanity and old age
Battley's Sedative —a strong tincture of opium
Norris's Drops —tartar emetic in wine
Parr's Life Pills —stated to cure both constipation and diarrhoea

and Holloway's Famous Ointment, which takes us on to advertising. Now conditioned by ethical codes of practice, we might have been a little surprised

by the popular press of the day. One pictorial advertisement showed good Queen Victoria enjoying a steaming cup of Cadbury's cocoa and another had a heading 'Two Infallible Products' over pictures of the Pope and a bottle of Bovril. However, even they drew the line somewhere and Thomas Holloway was thwarted in his intention to paint a gigantic advertisement for his Ointment on the White Cliffs of Dover—presumably for the benefit of passing mariners. The real maestro in this respect was the original Beecham, who started as a pedlar of herbal remedies and rose to fame and fortune on the Pills, mainly by outrageous advertising. The story goes that in 1889 the Vicar of South Shields appealed to him for some new hymn books. Beecham agreed, provided that a small advertisement could be inserted. When the books came the Vicar scanned all the end-pages anxiously, but could find no such insertion. All was revealed on Christmas Day, however, when the choir burst forth—

Hark! the herald angels sing,
Beecham's Pills are just the thing,
For easing pain and mothers mild,
Two for adult, one for child!

Talking about mother's mild, 'The Analyst' carried some advertising matter at this time, including one for 'Invalid Stout', at 12/6 for 9 gallons, 'suitable for nursing mothers'. All the products were severely scrutinised, of course, which may account for the cautious note in describing Sanitas as 'the latest development in science for the time being'.

Public Analysts were checking the accuracy of prescriptions as far back as 1876. Some prosecutions concerned Castor Oil Pills with no castor oil (plea of 'trade practice', nominal fine), Paregoric with no opium (alleged to have been sold as 'Paregoric Substitute', case dismissed) and Milk of Sulphur containing calcium sulphate (defence successfully cited the B.P. 1724). A number of cases were actually won.

In the year 1890 there was a strong move to amalgamate the S.P.A. with the Institute of Chemistry, which was then about four times as large as the S.P.A., the membership figures being roughly 800 and 200. Those in favour said that all the original objectives of the Society had now been achieved and all the work now fell within the functions of the Institute; they wanted to have a Standing Committee to represent chemists of all Government Departments and Local Authorites. There was some opposition from both sides, however, and the proposal failed. Dr Dyer notes that 'history has proved the wisdom of a separate but inter-dependent existence'.

Three years later, the Institute set up a qualifying examination system, and, by 1896 there was the 'Branch E' examination in the 'Analysis of Waters, Food and Drugs . . .'. Later, Therapeutics, Pharmacology and Microscopy were added, and the examination was recognised as a qualification for Public Analysts by the Local Government Board in 1900.

One has to record that there had been some bitter passages and hard feelings during these years between the S.P.A. and the aforementioned 'Somerset House',

but a new era dawned in 1894. In that year the Laboratory of the Government Chemist was formed, by combining the Inland Revenue and Customs Laboratories. Dr Thorpe was appointed head when the Laboratory was established in Clement's Inn Passage, and Dr Bell, the former director of the 'Somerset House' Laboratory, was invited to the first formal Annual Dinner of the Society. He made an historic speech, foretelling much better and more harmonious relations, which is happily true today.

Before this formal affair, Dr Dyer records that 'We had always thoroughly relaxed ourselves in Bohemian joviality', with no serious speeches but much music. His recollections of the Society's monthly meetings also have their social side. From the start, when they left the Chemical Society's Rooms, a number of members would 'repair to a secluded corner of the Criterion Bar to sit and smoke and drink lager beer and talk, usually until midnight. This afforded opportunity for the easy exchange of personal experiences and the discussion of professional matters, far more intimately than would have been possible in open meeting'.

Obviously there were no ladies present, since there were no women members until the present century, in spite of a notable champion called Mrs Dr Hoggan. She was asking, as early as 1879, 'There are female pharmacists and why not female analysts?'. The Editor of 'The Analyst', quoting this, must have thought it quite safe to reply 'We would welcome to our ranks any lady who had the courage to brave several years' training in a Laboratory'.

This story ends just when the Annual Dinner had to be cancelled because of the death of Queen Victoria, although one small trip into the twentieth century is irresistible. It was in 1909 that the President and Mr Chapman were sent to Paris, to attend an International Congress. They returned full of British indignation to report that 'they could not acquiesce in the formulation of any international standards'. All the French suggestions had been accepted; the French considered that borates were indispensable in butter, for instance, and Congress was to raise the water content to 18 per cent. Our men said it was 'at least questionable whether such standards would become legally binding here'.

I have to conclude the S.P.A. story before we added all those Other Analytical Chemists in 1906 and long before the tail wagged the original dog so hard that the dog fell off, in 1953, and became the Association of Public Analysts. With all the differences from those early days of the first Public Analysts, it is nevertheless possible to see, with respect and affection, that they were really *very* like ourselves. In 1975, I am glad to say 'All our own work and 101 years of it!'